

GLOBAL JOURNAL

OF MEDICAL RESEARCH: I

Surgeries and Cardiovascular System

Coronary Artery Disease

Cataract Surgery in Highly Myopic Eyes

Highlights

Uncommon Condition after CABG

Diagnosis of Peripheral Arterial Disease

Discovering Thoughts, Inventing Future

VOLUME 20

ISSUE 4

VERSION 1.0



GLOBAL JOURNAL OF MEDICAL RESEARCH: I
SURGERIES AND CARDIOVASCULAR SYSTEM



GLOBAL JOURNAL OF MEDICAL RESEARCH: I
SURGERIES AND CARDIOVASCULAR SYSTEM

VOLUME 20 ISSUE 4 (VER. 1.0)

OPEN ASSOCIATION OF RESEARCH SOCIETY

© Global Journal of Medical Research. 2020.

All rights reserved.

This is a special issue published in version 1.0 of "Global Journal of Medical Research." By Global Journals Inc.

All articles are open access articles distributed under "Global Journal of Medical Research"

Reading License, which permits restricted use. Entire contents are copyright by of "Global Journal of Medical Research" unless otherwise noted on specific articles.

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without written permission.

The opinions and statements made in this book are those of the authors concerned. Ultraculture has not verified and neither confirms nor denies any of the foregoing and no warranty or fitness is implied.

Engage with the contents herein at your own risk.

The use of this journal, and the terms and conditions for our providing information, is governed by our Disclaimer, Terms and Conditions and Privacy Policy given on our website <http://globaljournals.us/terms-and-condition/menu-id-1463/>

By referring / using / reading / any type of association / referencing this journal, this signifies and you acknowledge that you have read them and that you accept and will be bound by the terms thereof.

All information, journals, this journal, activities undertaken, materials, services and our website, terms and conditions, privacy policy, and this journal is subject to change anytime without any prior notice.

Incorporation No.: 0423089
License No.: 42125/022010/1186
Registration No.: 430374
Import-Export Code: 1109007027
Employer Identification Number (EIN):
USA Tax ID: 98-0673427

Global Journals Inc.

(A Delaware USA Incorporation with "Good Standing"; Reg. Number: 0423089)

Sponsors: Open Association of Research Society

Open Scientific Standards

Publisher's Headquarters office

Global Journals® Headquarters
945th Concord Streets,
Framingham Massachusetts Pin: 01701,
United States of America

USA Toll Free: +001-888-839-7392

USA Toll Free Fax: +001-888-839-7392

Offset Typesetting

Global Journals Incorporated
2nd, Lansdowne, Lansdowne Rd., Croydon-Surrey,
Pin: CR9 2ER, United Kingdom

Packaging & Continental Dispatching

Global Journals Pvt Ltd
E-3130 Sudama Nagar, Near Gopur Square,
Indore, M.P., Pin:452009, India

Find a correspondence nodal officer near you

To find nodal officer of your country, please
email us at local@globaljournals.org

eContacts

Press Inquiries: press@globaljournals.org
Investor Inquiries: investors@globaljournals.org
Technical Support: technology@globaljournals.org
Media & Releases: media@globaljournals.org

Pricing (Excluding Air Parcel Charges):

Yearly Subscription (Personal & Institutional)
250 USD (B/W) & 350 USD (Color)

EDITORIAL BOARD

GLOBAL JOURNAL OF MEDICAL RESEARCH

Dr. Apostolos Ch. Zarros

DM, Degree (Ptychio) holder in Medicine,
National and Kapodistrian University of Athens
MRes, Master of Research in Molecular Functions in
Disease, University of Glasgow FRNS, Fellow, Royal
Numismatic Society Member, European Society for
Neurochemistry Member, Royal Institute of Philosophy
Scotland, United Kingdom

Dr. Alfio Ferlito

Professor Department of Surgical Sciences
University of Udine School of Medicine, Italy

Dr. Jixin Zhong

Department of Medicine, Affiliated Hospital of
Guangdong Medical College, Zhanjiang, China, Davis
Heart and Lung Research Institute, The Ohio State
University, Columbus, OH 43210, US

Rama Rao Ganga

MBBS
MS (University of Health Sciences, Vijayawada, India)
MRCS (Royal College of Surgeons of Edinburgh, UK)
United States

Dr. Izzet Yavuz

MSc, Ph.D., D Ped Dent.
Associate Professor, Pediatric Dentistry Faculty of
Dentistry, University of Dicle Diyarbakir, Turkey

Sanguansak Rerksuppaphol

Department of Pediatrics Faculty of Medicine
Srinakharinwirot University
NakornNayok, Thailand

Dr. William Chi-shing Cho

Ph.D.,
Department of Clinical Oncology
Queen Elizabeth Hospital
Hong Kong

Dr. Michael Wink

Ph.D., Technical University Braunschweig, Germany
Head of Department Institute of Pharmacy and Molecular
Biotechnology, Heidelberg University, Germany

Dr. Pejic Ana

Assistant Medical Faculty Department of Periodontology
and Oral Medicine University of Nis, Serbia

Dr. Ivandro Soares Monteiro

M.Sc., Ph.D. in Psychology Clinic, Professor University of
Minho, Portugal

Dr. Sanjay Dixit, M.D.

Director, EP Laboratories, Philadelphia VA Medical Center
Cardiovascular Medicine - Cardiac Arrhythmia
Univ of Penn School of Medicine
Web: pennmedicine.org/wagform/MainPage.aspx?

Antonio Simone Laganà

M.D. Unit of Gynecology and Obstetrics
Department of Human Pathology in Adulthood and
Childhood "G. Barresi" University of Messina, Italy

Dr. Han-Xiang Deng

MD., Ph.D
Associate Professor and Research Department
Division of Neuromuscular Medicine
Davee Department of Neurology and Clinical
Neurosciences
Northwestern University Feinberg School of Medicine
Web: neurology.northwestern.edu/faculty/deng.html

Dr. Roberto Sanchez

Associate Professor
Department of Structural and Chemical Biology
Mount Sinai School of Medicine
Ph.D., The Rockefeller University
Web: mountsinai.org/

Dr. Feng Feng

Boston University
Microbiology
72 East Concord Street R702
Duke University
United States of America

Dr. Hrushikesh Aphale

MDS- Orthodontics and Dentofacial Orthopedics.
Fellow- World Federation of Orthodontist, USA.

Gaurav Singhal

Master of Tropical Veterinary Sciences, currently
pursuing Ph.D in Medicine

Dr. Pina C. Sanelli

Associate Professor of Radiology
Associate Professor of Public Health
Weill Cornell Medical College
Associate Attending Radiologist
NewYork-Presbyterian Hospital
MRI, MRA, CT, and CTA
Neuroradiology and Diagnostic Radiology
M.D., State University of New York at Buffalo,
School of Medicine and Biomedical Sciences
Web: weillcornell.org/pinasanelli/

Dr. Michael R. Rudnick

M.D., FACP
Associate Professor of Medicine
Chief, Renal Electrolyte and Hypertension Division (PMC)
Penn Medicine, University of Pennsylvania
Presbyterian Medical Center, Philadelphia
Nephrology and Internal Medicine
Certified by the American Board of Internal Medicine
Web: uphs.upenn.edu/

Dr. Seung-Yup Ku

M.D., Ph.D., Seoul National University Medical College,
Seoul, Korea Department of Obstetrics and Gynecology
Seoul National University Hospital, Seoul, Korea

Santhosh Kumar

Reader, Department of Periodontology,
Manipal University, Manipal

Dr. Aarti Garg

Bachelor of Dental Surgery (B.D.S.) M.D.S. in Pedodontics
and Preventive Dentistr Pursuing Phd in Dentistry

Sabreena Safuan

Ph.D (Pathology) MSc (Molecular Pathology and Toxicology) BSc (Biomedicine)

Getahun Asebe

Veterinary medicine, Infectious diseases, Veterinary Public health, Animal Science

Dr. Suraj Agarwal

Bachelor of dental Surgery Master of dental Surgery in Oromaxillofacial Radiology.
Diploma in Forensic Science & Oodontology

Osama Alali

PhD in Orthodontics, Department of Orthodontics, School of Dentistry, University of Damascus. Damascus, Syria. 2013 Masters Degree in Orthodontics.

Prabudh Goel

MCh (Pediatric Surgery, Gold Medalist), FISPU, FICS-IS

Raouf Hajji

MD, Specialty Assistant Professor in Internal Medicine

Surekha Damineni

Ph.D with Post Doctoral in Cancer Genetics

Arundhati Biswas

MBBS, MS (General Surgery), FCPS, MCh, DNB (Neurosurgery)

Rui Pedro Pereira de Almeida

Ph.D Student in Health Sciences program, MSc in Quality Management in Healthcare Facilities

Dr. Sunanda Sharma

B.V.Sc.& AH, M.V.Sc (Animal Reproduction, Obstetrics & gynaecology),
Ph.D.(Animal Reproduction, Obstetrics & gynaecology)

Shahanawaz SD

Master of Physiotherapy in Neurology PhD- Pursuing in Neuro Physiotherapy Master of Physiotherapy in Hospital Management

Dr. Shabana Naz Shah

PhD. in Pharmaceutical Chemistry

Vaishnavi V.K Vedam

Master of dental surgery oral pathology

Tariq Aziz

PhD Biotechnology in Progress

CONTENTS OF THE ISSUE

- i. Copyright Notice
 - ii. Editorial Board Members
 - iii. Chief Author and Dean
 - iv. Contents of the Issue
-
1. Factors Influencing Lifestyle Modification Practice among Hypertensive Patients: A Cross-Sectional Study in two Selected Eritrean Hospitals. *1-8*
 2. Coronary Artery Spasm– An Uncommon Condition after CABG. *9-11*
 3. The Evolution of Mitral Valve Repair in India. *13-15*
 4. Cataract Surgery in Highly Myopic Eyes. *17-21*
 5. The Relationship between Rheumatic Heart Disease and Coronary Artery Disease and its Implications. *23-28*
 6. To Study the Sensitivity and Specificity of Ankle Brachial Index in Diagnosis of Peripheral Arterial Disease in Diabetics with Coronary Artery Disease at a Large Tertiary Care Teaching Hospital. *29-33*
-
- v. Fellows
 - vi. Auxiliary Memberships
 - vii. Preferred Author Guidelines
 - viii. Index



GLOBAL JOURNAL OF MEDICAL RESEARCH: I
SURGERIES AND CARDIOVASCULAR SYSTEM
Volume 20 Issue 4 Version 1.0 Year 2020
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-4618 & Print ISSN: 0975-5888

Factors Influencing Lifestyle Modification Practice among Hypertensive Patients: A Cross-Sectional Study in two Selected Eritrean Hospitals

By Idris M. Idris, Samuel J. Wolday, Brkti Abraham, Daniel Abraham, Filmawit Negassi, Habtom Mezgebo & Solomon Mengisteab

Abstract- Objective: Hypertension is one of the major causes of morbidity and mortality in both developed and developing countries requiring an urgent controlling strategies. Lifestyle modifications often called non-pharmacological strategies are considered the corner stone in the prevention and control of hypertension. The purpose of this study was to assess the practice of lifestyle modifications and its influencing factors among hypertensive patients in Halibet and Hazhaz Hospitals in Asmara, Eritrea.

Methods: Hospital-based cross-sectional study was conducted among 360 hypertensive patients in Halibet and Hazhaz Hospitals of Asmara from February through May 2018. A non-probabilistic consecutive sampling was used to select study participants. Data were analyzed using SPSS version 22. A bivariate and multivariate analysis was done to determine independent predictors of lifestyle modifications among hypertensive patients. Adjusted odds ratio (at 95%CI) and p value < 0.05 was used to assert the independent effect of each variable on the outcome variable.

Keywords: hypertension, lifestyle modification, practice, hospital, halibet, asmara.

GJMR-I Classification: NLMC Code: WG 340



Strictly as per the compliance and regulations of:



© 2020. Idris M. Idris, Samuel J. Wolday, Brkti Abraham, Daniel Abraham, Filmawit Negassi, Habtom Mezgebo & Solomon Mengisteab. This is a research/review paper, distributed under the terms of the Creative Commons Attribution-Noncommercial 3.0 Unported License (<http://creativecommons.org/licenses/by-nc/3.0/>), permitting all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

Factors Influencing Lifestyle Modification Practice among Hypertensive Patients: A Cross-Sectional Study in two Selected Eritrean Hospitals

Idris M. Idris ^α, Samuel J. Wolday ^σ, Brkti Abraham ^ρ, Daniel Abraham ^ω, Filmawit Negassi [¥], Habtom Mezgebo [§] & Solomon Mengisteab ^x

Abstract- Objective: Hypertension is one of the major causes of morbidity and mortality in both developed and developing countries requiring an urgent controlling strategies. Lifestyle modifications often called non-pharmacological strategies are considered the corner stone in the prevention and control of hypertension. The purpose of this study was to assess the practice of lifestyle modifications and its influencing factors among hypertensive patients in Halibet and Hazhaz Hospitals in Asmara, Eritrea.

Methods: Hospital-based cross-sectional study was conducted among 360 hypertensive patients in Halibet and Hazhaz Hospitals of Asmara from February through May 2018. A non-probabilistic consecutive sampling was used to select study participants. Data were analyzed using SPSS version 22. A bivariate and multivariate analysis was done to determine independent predictors of lifestyle modifications among hypertensive patients. Adjusted odds ratio (at 95%CI) and p value < 0.05 was used to assert the independent effect of each variable on the outcome variable.

Results: The study revealed that 258 (71.7%) of the respondents attained the recommended lifestyle modification practices, while the remaining 28.3% had poor practice. The study found that being female [AOR (CI): 1.8 (0.63, 4.85), p<0.05], Having higher educational status[AOR (CI): 2.02 (0.69, 4.28), p value< 0.001], Being married[AOR (CI): 3.2 (0.79, 7.26), p<0.05], Less than 5 years duration since diagnosis [AOR (CI): 1.92 (0.65, 4.89), p<0.05], and Being educated about the importance of lifestyle modifications[AOR (CI): 2.3 (1.14, 5.89), p≤ 0.05] were factors significantly influenced the practice of lifestyle modification.

Conclusion: Lifestyle modification practices among hypertensive patients were relatively high in this study. Therefore, patients should be given a sustainable advice and support to achieve and maintain best outcomes of lifestyle modification practices.

Keywords: hypertension, lifestyle modification, practice, hospital, halibet, asmara.

I. BACKGROUND

Hypertension is a global public health challenge due to its high prevalence and the associated risk of stroke and cardiovascular diseases in adults. Out of the total 7.5 million deaths caused by hypertension worldwide, about 12.8% of the total annual deaths occur in Sub-Saharan Africa (SSA)[1, 2]. Recently, hypertension has emerged as a major public health problem in SSA [3] due to the globalization and modernization trends, characterized by a sedentary style of life and consumption of diet rich in refined carbohydrates and animal fat. Hypertension has been found to be a significant cause of renal and cardiovascular diseases [4]. On the top of being the highest risk factor for death globally, hypertension is found responsible for 62% of cases of cerebrovascular disease and 49% of cases of ischemic heart disease [5, 6].

Adoption of a life style modification is of critical importance for preventing and managing hypertension. It does not only reduce blood pressure but can delay the incidence of hypertension, enhance antihypertensive drug efficacy, and decrease cardiovascular risk [7]. In patients with hypertension, life style modification can serve as initial treatment before the start of drug therapy and as an adjunct to medication-controlled blood pressure (BP), these therapies can facilitate drug step-down and drug withdrawal in highly motivated individuals who achieve and sustain lifestyle changes [8, 9]. The recommended practice of a lifestyle modification includes weight reduction, salt restriction, and physical activity, smoking cessation and abstaining from alcohol [7, 10].

As reported in different studies age, marital status, gender differences, income, getting health information, the existence of co-morbidity, knowledge on hypertension, duration of treatment and educational status were factors found to influence lifestyle modification practice [11–16]. Little is known about life style modification practice among hypertensive patients in Eritrea. It is to this view that, the determination of practice to lifestyle modifications among hypertensive patients becomes crucial. This current study therefore pursued to assess the practice rate of lifestyle

Corresponding Author α: Department of Anesthesia, Eritrean Air Force Hospital. e-mail: idrismd2017@gmail.com

Author σ σ ω ¥ § χ: Department of Nursing, Asmara College of Health Sciences, Asmara, Eritrea.

modifications and its influencing factors among individuals living with hypertension in Asmara, Eritrea.

II. METHODS

a) Study Design/Setting

This was a hospital based cross-sectional study conducted among hypertensive patients at the hypertension clinics of Hazhaz and Halibet hospitals from February through May 2018. These two hospitals located in Asmara (the capital of Eritrea) are the only hospitals providing follow up care for hypertensive patients. Hazhaz hospital is located in North West of Asmara; while Halibet hospital is located in the North East of the city. Both the hospitals provide a comprehensive out-patient and in-patient services.

b) Study Population and Sample Recruitment

The target population was hypertensive patients who were on antihypertensive therapy attending the hypertensive clinic. There were about 5860 registered hypertensive patients in Halibet and Hazhaz Hospital taking antihypertensive medication regularly as outpatient follow-up. Among these patients, 3410 were from Hazhaz Hospital and the remaining 2450 were from Halibet hospital. The sample size was determined using a single population proportion by assuming 50% proportion of the patients practiced lifestyle modifications with 95% confidence interval and 5% margin of error. To attain a strongest statistical power and effect size, adding a population correction formula and non-response rate, the sample size was projected to 360 participants. The sample size for Halibet and Hazhaz hospital was calculated as per proportion of the population of each hospital. Patients were approached during their follow up time using a consecutive non probability sampling method until the required sample size was reached. Pregnancy induced hypertension, health professionals under antihypertensive and patients diagnosed of hypertension for less than three months were excluded.

c) Research Variables

Dependent variable: Patients practice level to life style modification was the outcome variable.

The independent variables include: Patients socio demographic characteristics (age, sex, religion, occupation, monthly income and marital status) and Blood pressure and medication characteristics (current BP, number of drugs, hospitalization history, comorbid disease, duration of disease, dosage and number of pills per day).

d) Data Collection Tool

A well-reviewed, pretested and structured questionnaire which consisted of three sections was used to collect data. The first section covered the demographic data of the study participants which includes age, gender, socioeconomic level, marital

status, occupation status and religion. The second section comprised clinical and medication characteristics. The third section constituted questions pertaining to life style modification practices which include: adopting low salt healthy diet, avoiding smoking, avoiding alcohol consumption, physical activity and weight management. The lifestyle modification practices were measured using questionnaires adapted from WHO STEPS questionnaires [10]. Hypertension self-care activity scales [7] were specifically adopted to measure the lifestyles practices questions in the local context.

e) Life Style Modification Practice Measurements

Physical activity: Physical activity was assessed by two items. "How many of the past 7 days did you do at least 30 minutes total of physical activity?" and "how many of the past 7 days did you do a specific exercise activity (such as walking, aerobics or biking) other than what you do around the house or as part of your work?" Responses were summed (Range 0–14) patients who scored eight and above were coded as a having good physical activity practice. All others coded as poor practice.

Low-salt diet: Ten items were used to assess practices related to eating a healthy diet, avoiding salt while cooking and eating or any kind of added salt, and avoiding foods high in salt content. A mean score was calculated. Scores of five or above indicate that patients followed the low-salt diet and considered as having good low salt diet practice.

Smoking: Smoking status was assessed with one item, "How many of the past 7 days did you smoke a cigarette?" Respondents who reported none were considered as "nonsmokers".

Weight management: Ten items assessed using activities undertaken to manage weight through dietary practices such as reducing portion size and making food substitutions (low fat and high fiber intake) as well as exercising to lose weight during the past 30 days.

Response categories ranged from strongly disagree (1) to strongly agree (5). Responses were summed creating a range of scores from 10 to 50. Participants who report that they agreed or strongly agreed with all ten items (score ≥ 40) were considered to have a good weight management practice.

Alcohol- Alcohol intake was assessed using 3-items. Not drinking any type of alcohol containing drinks was considered as good practice with regard to alcohol consumption.

f) Ethical Approval

After Approval of the study was obtained from "Research and Ethical Committee" of the School of Nursing, Asmara College of Health Sciences (ACHS), support letter from the School of Nursing, ACHS, was

taken to Hazhaz and Halibet medical officers for allowing data collection. Each study participant was adequately informed about the purpose, method and anticipated benefit of the study by the data collectors. Verbal and written consent was obtained from study participants and anonymity was maintained to ensure confidentiality. The responders' right to refuse or withdraw from the study was also respected fully. And all patients who were able to give informed consent by their signature (could be thumb signature) were invited to participate in the study.

g) *Data Collection Procedures*

The questionnaire was translated from English to Tigrinya (native language) and then back to English by other translator to ensure its consistency. In order to recognize the weakness, strength and consistency of the questionnaire, the questions were first piloted in Halibet hospital at the hypertension clinic on 36 hypertensive patients selected randomly. The questionnaire was found consistent, clear in language and comprehensible, thus no modifications was done during the main study. However, due to increased absenteeism and non-response rate of the randomly selected individuals, the researchers decided to adopt a non-probabilistic convenience sampling during the main study. Data were collected by the researchers using face to face interview method.

h) *Data Analysis*

Data analysis was performed using SPSS (Statistical Package for Social Sciences) version 22.

Descriptive statistics of the demographic and other clinical variable was illustrated using frequencies and tables. Lifestyle modification practices containing physical exercise, low salt diet, alcohol consumption, smoking and weight management practices was classified as a 'good practice' and 'poor practice'. Participants who scored above the mean in all recommended lifestyle questions were labeled to have "good" 'lifestyle modification practices. Bivariate analysis was done to find out the strength of the associations of each independent variable with the rate of lifestyle modification practice. Significant variables at the bivariate level were further analyzed using multivariate analysis to adjust the confounding effect. A p-value of < 0.05 was considered significant during the analysis.

III. RESULT

a) *Socio Demographic Characteristics*

The study included 360 hypertensive patients. The mean age (\pm SD) of the participants was 62.4 years (\pm 8.6) with majority (49.2%) of the participants were within the age range of 52 - 68 years. Most of the participants were married (79.2%), females (54.4%), unemployed (78.3%), and have had secondary and above educational level (38%). Majority of the participants (83.3%) were orthodox Christians (Table 1).

Table 1: Socio-demographic characteristics of hypertensive patients in Hazhaz and Halibet Hospitals, Asmara, May 2018 (N = 360)

Variables	Frequency (N= 360)	Percent (%)
Age in years (Mean \pm SD: 62.4 \pm 8.6)		
	18-34	6
	34-51	54
	52-68	177
	69-85	123
Sex		
	Male	164
	Female	196
Marital status		
	Married	285
	Single	21
	Divorced/widowed	54
Religion		
	Orthodox	300
	Catholic	21
	Muslim	34
	Protestant	5

Employment status	Unemployed	282	78.3
	Employed	78	21.7
Educational status	Illiterate	128	35.6
	primary	95	26.4
	Secondary and above	137	38

The mean duration of hypertension among the participants was 5.2 years (SD±2.3). Only 19.2% of the respondents had history of hospitalization due to hypertension and more than half (57.5%) had comorbidities like heart disease and diabetes. Majority of the respondents (56%) had a controlled blood pressure <140/90. eighty nine (24.7%) of the study

subjects had taken the medication for more than ten years and only 8.3% of the respondents had taking the medication for less than one year. More than one-third of the participants (35.6%) had family history of hypertension. Majority of the participants (84%) have taken a routine education by health personnel about the practices of lifestyle modification (Table 2).

Table 2: Medication and health related factors among hypertensive patients in Hazhaz and Halibet Hospitals, Asmara, May 2018 (N = 360)

Variables	Frequency (N=360)	Percent (%)
Hospitalization history		
Yes	69	19.2
No	291	80.8
Blood pressure		
<140/90	202	56
>=140/90	158	44
Duration of hypertension (Mean±SD: 5.2±2.3)		
≤ 2 year	30	8.3
2-4 years	92	25.6
5-7 yrs.	70	19.4
8-10 yrs.	79	21.9
> 10 yrs.	89	24.7
Family history of hypertension		
Yes	128	35.6
No	232	64.4
Having comorbid disease*		
Yes	153	42.5
No	207	57.5
Dosage frequency per day		
Once daily	140	38.9
Two times a day	179	49.7
Three times or more	41	11.4
Number of pills per day		
One pill	109	30.3
Two pills	158	43.9
Three pills	51	14.2
Four and above pills	42	11.7
Being educated on lifestyle modifications by health personnel		
Yes	302	84
No	58	16

*Comorbid disease:Diabetes and Heart Disease



b) Lifestyle Modification Practice

Two hundred and fifty eight (71.7%) of the respondents attained the recommended lifestyle modification practices, while the remaining 28.3% had poor practice (Figure 1).

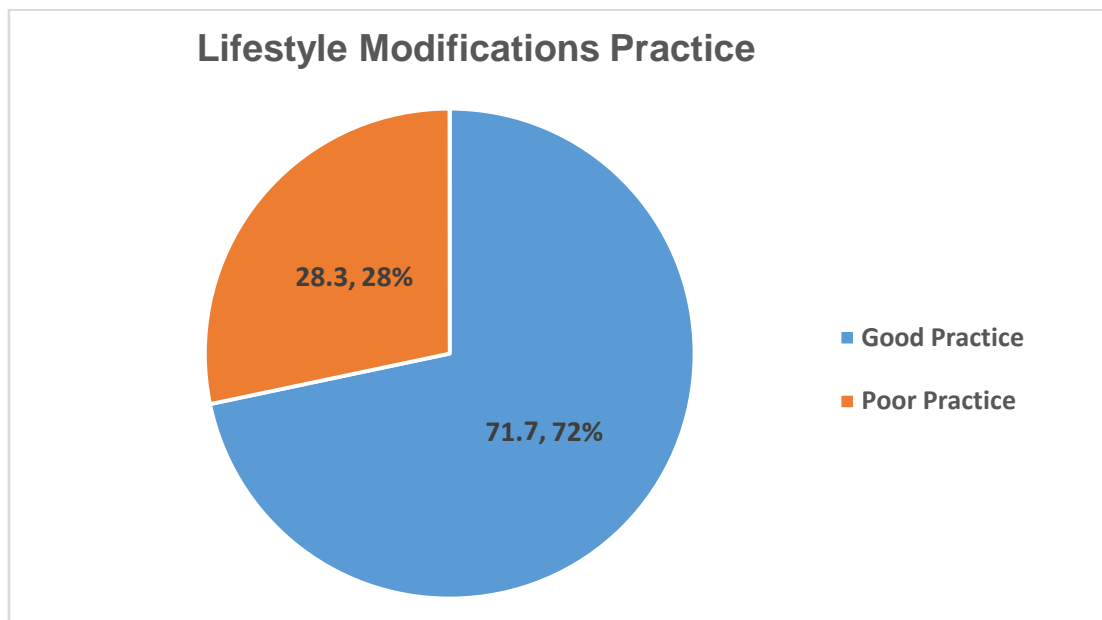


Figure 1: Prevalence rate of Life style modification practice among hypertensive patients in Hazhaz and Halibet Hospitals, Asmara, May 2018 (N = 360)

The mean (\pm SD) score for physical activity was 6.36(\pm 2.45), with the maximum score of 14. Out of the total participants, two hundred and seven (57.5%) had a good physical exercise practice. The mean (\pm SD) score for low salt diet was 6.59(\pm 2.03). From the patients, 318 (88.3 %) practiced the recommended healthy diet with low diet salt. From the items with a maximum score of

50, the mean (\pm SD) score of weight management practice of the respondents was 39.6(\pm 8.43). Two hundred forty eight (68.9%) patients had good weight management practices. One hundred eighty (87.8%) did not drink alcohol and One hundred eighty-seven (95.8%) were non-smokers (Table 3).

Table 3: Distribution of Life style modification practices among hypertensive patients in Hazhaz and Halibet Hospitals, Asmara, May 2018 (N = 360)

Adherence to Lifestyle Modifications	Frequency (N=360)	Percentage (%)
Practicing regular physical exercise		
Yes	207	57.50%
No	153	42.50%
Alcohol consumption		
Never drinks	316	87.80%
Drinks	44	12.20%
Weight management practices		
Good	248	68.90%
Poor	112	31.10%
Smoking status		
Non smokers	345	95.80%
Smokers	15	4.20%
Lowering salt intake		
Yes	318	88.30%
No	42	11.70%

c) *Predictors of Lifestyle Modification Practice*

Factors related to educational level, marital status, gender, duration of disease, and being educated about lifestyle modifications were found to have significant association with lifestyle modification practices. The practice of lifestyle modification was 2.02 times better practiced among patients reached secondary and above educational level compared to the lower educated patients [AOR (CI): 2.02 (0.69, 4.28), $p < 0.001$]. Similarly, participants who reported of being educated by health personnel on lifestyle modifications were 2.3 times more likely to adhere on lifestyle modification practices [AOR (CI): 2.3 (1.14,

5.89), $p \leq 0.05$]. Female [AOR (CI): 1.8 (0.63, 4.85), $p < 0.05$] and married [AOR (CI): 3.2 (0.79, 7.26), $p < 0.05$] patients were 1.8 and 3.2 times more likely to practice lifestyle modifications than their counter parts. Those who had hypertension for less than 5 years duration [AOR (CI): 1.92 (0.65, 4.89), $p < 0.05$] were significantly associated with high rate of adherence to lifestyle modification practices. Factors related to age, religion, blood pressure reading, dosage and frequency of drugs, Family hypertension history and comorbidity of disease didn't had significant influence on practice of lifestyle modification (Table 4)

Table 4: Predictors of lifestyle modification practice among hypertensive patients in Hazhaz and Halibet Hospitals, Asmara, May 2018 (N = 360)

Characteristics	Lifestyle Modification Practice		COR (95% CI)	AOR (95% CI)
	Good N(%)	Poor N (%)		
Female sex	146 (74.5)	50 (25.5)	2.32 (0.95, 6.23)**	1.8 (0.63, 4.85)**
Age < 60 years	98 (66.2)	50 (33.8)	1.98 (0.65, 4.23)**	1.2 (0.03, 5.09)
Being employed	42 (53.8)	36 (46.2)	1.12 (0.23, 3.52)	
Married	217 (76)	68 (24)	3.62 (1.22, 8.65)***	3.2 (0.79, 7.26)**
Christian religion	125 (38.3)	201 (61.7)	0.83 (0.45, 3.12)	
Secondary/above education	93 (68)	44 (32)	2.4 (0.86, 5.29)***	2.02 (0.69, 4.28)***
Hospitalization history	35 (51)	34 (49)	0.98 (0.33, 2.51)	
Duration of disease < 5 years	88 (72)	34 (28)	2.85 (1.32, 7.89)**	1.92 (0.65, 4.89)**
Familyhypertensive history	59 (46)	69 (54)	0.85 (0.22, 2.43)	
BP < 140/90 mmHg	107 (52.9)	95 (47.1)	1.14 (0.63, 3.25)**	0.8 (0.41, 2.73)
Having comorbid disease	74 (48.4)	79 (51.6)	0.79 (0.11, 2.69)	
Taking drugs > twice/day	108 (49)	112 (51)	0.89 (0.31, 3.23)	
Educated about good lifestyle	224 (74)	78 (26)	2.6 (1.19, 6.89)***	2.3 (1.14, 5.89)**

BP: Blood Pressure; **, ***: P value < 0.05 and P value < 0.001 respectively

IV. DISCUSSION

This study determined lifestyle modification practices among hypertensive patients of Hazhaz and Halibet hospital. Findings of the study showed that out of the 360 participants enrolled, two hundred and fifty eight (71.7%) were adherent to life style modification practices. This finding is comparable with a study done in china[17] but higher than from study done in Saudi Arabia and Ethiopia [12, 15]. Among lifestyle modifications, about (56%) had good physical exercise practice; almost (69%) had good weight management practices and 88.3% had low salt intake. Other studies done in Saudi Arabia and USA reported lower results with regard to the lifestyle modification items [12,18]. The discrepancies in lifestyle modification practices between our study and the others may be attributed to settings difference. Another reason could be the

socioeconomic and sedentary lifestyle differences between the populations.

Association between factors and the practice of lifestyle modification showed that level of education and awareness about lifestyles, marital status, gender and duration of disease significantly influenced the general practice of lifestyle modifications. Participants who had secondary and above education and those who were educated about lifestyle modifications were more likely to practice lifestyle modifications. This is consistent with the study done Nigeria and Botswana in which the practice of lifestyle modification was higher as educational status increases [13, 14]. Similar study conducted in Ethiopia [19] reported that the level of lifestyle modification practice was significantly associated with higher educational status. This could probably be due to the fact that highly educated patients have better chance to come across

considerable information on the disease from different educational sources.

Some studies [15, 20] reported that longer duration of treatment were found to have had good lifestyle modification, while others reported to the reverse i.e. those patients with longer years of treatment were shown to have reduced odds of adherence. Findings of our study showed better practice of lifestyle modification among patients having hypertension treatment for less than 5 years than those living for more than 5 years with hypertension treatment. The reason of the difference could be due to the fact that those who have had hypertension for longer duration do not see the condition as life threatening anymore (as they think that they adapted it normal) as compared to those with shorter duration who might follow strict lifestyle modification practices.

Patients without comorbidity were more likely to practice lifestyle modification in studies done in India and Ethiopia [11, 15]. Likewise, about 52% of the comorbid participants in our study were poorly adherent to practice lifestyle modifications, though the difference was not significant. This might be explained that the presence of comorbidities can worsen the conditions of the patients and make them unable to adhere to practice lifestyle changes.

Various studies depicted an increased odd of adhering to lifestyle modification practices among married patients [16, 20]. Consistently, findings of our study indicated significantly good practice of lifestyle modification among married and female patients. The reason for the good practice of lifestyle modification in married couples could probably be due to the support they get from their spouse helping them to positively practice diet and exercise recommendations.

Findings from this study showed that participants who reported of being educated on the importance of lifestyle modifications were significantly associated with good practice of lifestyle modification.

V. LIMITATIONS OF THE STUDY

Lack of adequate studies in our country made comparison difficult for the lifestyle changes. The fact that the data was self-report from the participants, the results might be subjected to recall bias and there may be the denial of poor practices from the respondents, which affects the result of the study. Researchers have tried their top best to build a rapport with the patients to collect sincere data from the respondents. This was a quantitative study where a questionnaire was only used to collect information; therefore a qualitative study may be of value to explore the subject further. The study was conducted in the capital city only, hence generalizability of the results for the whole nation is difficult. Further nationwide study is recommended.

VI. CONCLUSION

This study revealed a relatively higher lifestyle modification practice among the hypertensive patients. Female gender, Duration of the hypertension diagnosis (< 5 years), Higher educational level, Married and being educated about lifestyle modifications were factors significantly associated with good lifestyle modification practice. In addition to their pharmacologic therapy, hypertensive patients should be given education, advice and support to achieve and maintain best outcomes of lifestyle modification practices to better control their blood pressure.

Declarations

Abbreviations

BP: Blood Pressure; SD: Standard deviation; COR: Crude odds ratio; AOR: Adjusted odds ratio; CI: Confidence interval; ACHS: Asmara College of Health Sciences; SPSS: Statistical Package for Social Sciences

Acknowledgements

We would like to thank the health managers and the patients who have been very cooperative during data collection.

Funding

There was no financial support from any organization.

Availability of data and materials

The complete data set supporting the conclusions of this article is available from the corresponding author and can be accessed upon reasonable request.

Authors' contributions

All authors participated in all phases of the study including topic selection, design, data collection, data analysis and interpretation. Idris and Samuel contributed in critical revision of the manuscript. All the authors read and approved the manuscript.

Ethics approval and consent to participate

Ethical approval was obtained the "Research and Ethical Committee" of the School of Nursing, Asmara College of Health Sciences (ACHS). The purpose of the study was explained to the study participants at the time of data collection and informed consent was secured from each participant before the start of data collection. Confidentiality was ensured by excluding names or other personal identifiers in the data collection tool. The right of the participants to refuse participation or not to answer any of the questions was respected.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

REFERENCES RÉFÉRENCES REFERENCIAS

1. Awoke A, Awoke T, Alemu S, Megabiaw B. Prevalence and associated factors of hypertension among adults in Gondar, Northwest Ethiopia: a community based cross-sectional study. *BMC CardiovascDisord.* 2012; 12:113.
2. World Health Organization. Preventing chronic diseases: a vital investment. In: Vita-Finzi L, editor. . Geneva: World Health Organization; 2005.
3. Edwards, R., Unwin, N., Mugusi, F., Whiting, D., Rashid, S., Kissima, J., Aspray, T.J. and Alberti, K.G.M. (2000) Hypertension Prevalence and Care in an Urban and Rural Area of Tanzania. *Journal of Hypertension*, 18, 145-152. <https://doi.org/10.1097/00004872-200018020-00003>
4. Cooper, R.S., Amoah, A.G. and Mensah, G.A. (2003) High Blood Pressure: The Foundation for Epidemic Cardiovascular Disease in African Populations. *Ethnicity and Disease*, 13, 2-48.
5. Ghezalbash S, Ghorbani A. Lifestyle modification and hypertension prevention. *ARYA Atherosclerosis J.* 2012; 8:S202–7.
6. Al-Gelban KS, Khan MY, Al-Khaldi YM, Mahfouz AA, Abdelmoneim I, Daffalla A, et al. Adherence of primary health care physicians to hypertension management guidelines in the Aseer region of Saudi Arabia. *Saudi J Kidney Dis Transpl.* 2011; 22(5):941–8.
7. Chobanian, A.V., Bakris, G.L., Black, H.R., Cushman, W.C., Green, L.A., Izzo Jr., J.L., Jones, D.W., Materson, B.J., Oparil, S. and Wright Jr., J.T. (2003) The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: The JNC 7 Report. *JAMA*, 289, 2560-2571, Atlanta: USA. <https://doi.org/10.1001/jama.289.19.2560>
8. Stamler, J., Neaton, J.D. and Wentworth, D.N. (1989) Blood Pressure (Systolic and Diastolic) and Risk of Fatal Coronary Heart Disease. *Hypertension*, 13, I2. https://doi.org/10.1161/01.HYP.13.5_Suppl.I2
9. Borhani, N.O., Applegate, W.B., Cutler, J.A., Davis, B.R., Furberg, C.D., Lakatos, E., Page, L., Perry, H.M., Smith, W.M. and Probstfield, J.L. (1991) Systolic Hypertension in the Elderly Program (SHEP). Part 1: Rationale and Design. *Hypertension*, 17, II2. https://doi.org/10.1161/01.HYP.17.3_Suppl.II2
10. Marfo AFA, Owusu-Daaku28. World Health Organization. The WHO STEP wise approach to surveillance of non-communicable diseases (STEPS). Geneva: World Health Organization; 2003.
11. Durai V, Muthuthandavan AR. Knowledge and practice on lifestyle modifications among males with hypertension. *Indian J Community Health.* 2015; 27(1):143–9.
12. Elbur AI. Level of adherence to lifestyle changes and medications among male hypertensive patients in two hospitals in Taif; Kingdom of Saudi Arabia. *Int J Pharm Pharm Sci.* 2015;7(4):168–72.
13. Okwuonu CG, Ojimadu NE, Okaka EI, Akemokwe FM. Patient-related barriers to hypertension control in a Nigerian population. *Int J Gen Med.* 2014;7:345–53.
14. Zungu LI, DjumbeFR, Setswe KG. Knowledge and lifestyle practices of hypertensive patients attending a primary health care clinic in Botswana. *AJPHERD* 2013:123-38.
15. Buda, E., Hanfore, L., Fite, R. and Buda, A. “Lifestyle modification practice and associated factors among diagnosed hypertensive patients in selected hospitals, South Ethiopia”, *Clinical Hypertension* (2017) 23:26, DOI 10.1186/s40885-017-0081-1.
16. Obirikorang, Y., Obirikorang, C., Acheampong, E., Anto, E.O., Amoah, B., Fosu, E., Amehere, J.A.E., Batu, E.N., Brenya, P.K., Amankwaa, B., Adu, E.A., Akwasi, A.G. and Asiwu, R.Y. (2018) Adherence to Lifestyle Modification among Hypertensive Clients: A Descriptive Cross-Sectional Study. *Open Access Library Journal*, 5: e4375. <https://doi.org/10.4236/oalib.1104375>.
17. Hu H, Li G, Aro T. Prevalence rates of self-care behaviors and related factors in a rural hypertension population: a questionnaire survey. *Int J Hypertens.* 2013; 2013:526949.
18. Warren-Findlow J, Seymour RB. Prevalence rates of hypertension self-care activities among African Americans. *J Natl Med Assoc.* 2011;103 (5):503–12
19. Hareri HA, Abebe M, Asefaw T. Assessments of adherence to hypertension managements and its influencing factors among hypertensive patients attending black lion hospital chronic follow up unit, Addis Ababa, Ethiopia-across-sectional study. *Int J Pharm Sci Res.* 2013;4(3):1086–95.
20. Okwuonu CG, Emmanuel CI, Ojimadu NE. Perception and practice of lifestyle modification in the management of hypertension among hypertensive in south-east Nigeria. *Int J Med Biomed Res.* 2014;3(2):121–31.



GLOBAL JOURNAL OF MEDICAL RESEARCH: I
SURGERIES AND CARDIOVASCULAR SYSTEM
Volume 20 Issue 4 Version 1.0 Year 2020
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-4618 & Print ISSN: 0975-5888

Coronary Artery Spasm– An Uncommon Condition after CABG

By Lau Kwun-Wang Ambrose, Chengwai-Yeung Rechar, Chan Ho-Yan Howard & Cheung Hung-Leong

Abstract- Aim: Coronary artery bypass grafting (CABG) is one of the most common cardiac surgery done in Hong Kong for ischemic heart diseases.

We report a case of a 55-year-old man who demonstrated native coronary artery spasm following on-pump CABG which was managed by intra-aortic balloon pump (IABP) insertion and vasodilators.

Method: A 55-year-old man, ex-smoker, with history of PVD, presented with unstable angina. CABG was performed and the procedure was unremarkable. 2 hours after operation, patient developed sudden cardiac arrest. Bedside sternotomy was performed, findings was unremarkable. IABP was inserted and later further supported by VA ECMO. Coronary angiogram showed diffuse spasm all three native major coronary arteries, demonstrating competitive flow. All three native coronary arteries responded to Glyceryl trinitrate (GTN) infusion. Two bypass graft (LSV and LIMA) was patent. The coronary artery spasm improved with continuous GTN infusion.

Keywords: CABG, coronary artery spasm.

GJMR-I Classification: NLMC Code: WG 169



Strictly as per the compliance and regulations of:



© 2020. Lau Kwun-Wang Ambrose, Chengwai-Yeung Rechar, Chan Ho-Yan Howard & Cheung Hung-Leong. This is a research/review paper, distributed under the terms of the Creative Commons Attribution-Noncommercial 3.0 Unported License (<http://creativecommons.org/licenses/by-nc/3.0/>), permitting all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

Coronary Artery Spasm– An Uncommon Condition after CABG

Lau Kwun-Wang Ambrose ^α, Chengwai-Yeung Rechar ^σ, Chan Ho-Yan Howard ^ρ
& Cheung Hung-Leong ^ω

Abstract- Aim: Coronary artery bypass grafting (CABG) is one of the most common cardiac surgery done in Hong Kong for ischemic heart diseases.

We report a case of a 55-year-old man who demonstrated native coronary artery spasm following on-pump CABG which was managed by intra-aortic balloon pump (IABP) insertion and vasodilators.

Method: A 55-year-old man, ex-smoker, with history of PVD, presented with unstable angina. CABG was performed and the procedure was unremarkable. 2 hours after operation, patient developed sudden cardiac arrest. Bedside sternotomy was performed, findings was unremarkable. IABP was inserted and later further supported by VA ECMO. Coronary angiogram showed diffuse spasm all three native major coronary arteries, demonstrating competitive flow. All three native coronary arteries responded to Glyceryl trinitrate (GTN) infusion. Two bypass graft (LSV and LIMA) was patent. The coronary artery spasm improved with continuous GTN infusion.

Results: This case illustrates coronary artery spasm, an uncommon post-CABG condition. It has an extremely high mortality and morbidity. It may occur anytime intra-operatively or immediate post-operative. It is still unclear on the actual etiology of coronary artery spasm after CABG. The standard for diagnosis is coronary angiogram, demonstrating diffuse coronary artery spasm responsive to intravenous injection of vasodilator agents. Management includes vasodilators, especially calcium channel blockers, supportive management and Rho-inase inhibitor

Conclusion: Our patient is fortunate to survive with minimal organ dysfunction and minimal functional impairment. We must be aware of this rare but extremely high mortality post CABG condition, and to act immediately.

Keywords: CABG, coronary artery spasm.

I. CASE REPORT

In ischemic heart diseases, first line treatment would be lifestyle modifications, followed by medical treatment (most commonly antiplatelets) and percutaneous coronary intervention (PCI). Coronary Artery Bypass Graft (CABG) is mainly reserved for ischemic heart diseases refractory to optimal medical treatment, triple vessel diseases, left main diseases.

Author σ ρ ω : Department of Cardiothoracic Surgery, Queen Elizabeth Hospital, 30 Gascoigne Road, Hong Kong.

Corresponding Author α : Department of Cardiothoracic Surgery, Queen Elizabeth Hospital, 30 Gascoigne Road, Hong Kong.
e-mail: lau.ambrose@gmail.com

We report a case of 55-year-old man, ex-smoker, presented with unstable angina. He was put on dual anti-platelet agents, but failed optimal medical therapy. He was also later found to be refractory to multiple PCI. He has also bilateral lower limb peripheral vascular diseases (PVD), with right common femoral artery and right superficial femoral artery stenosis with angioplasty done before.

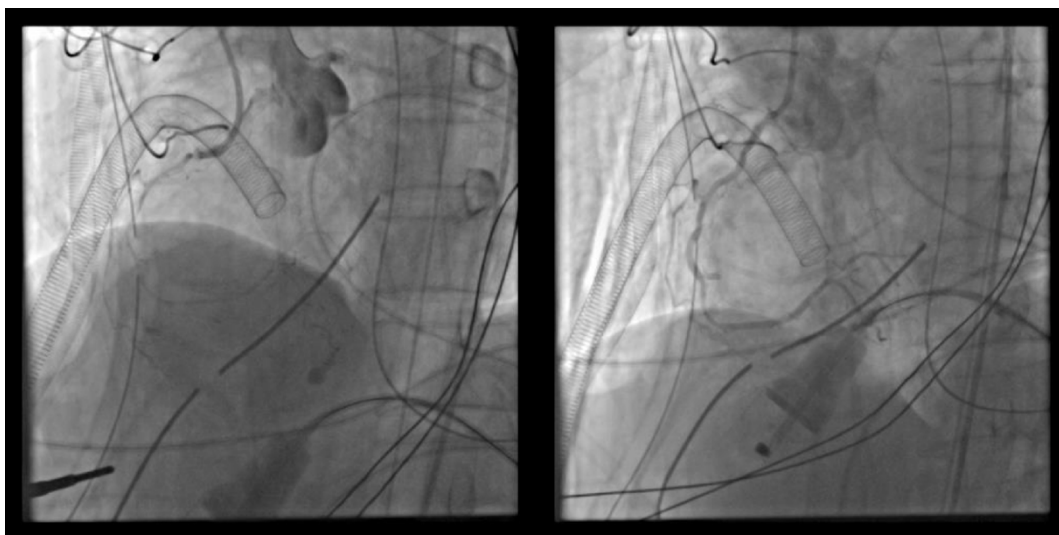
As part of the work-up, coronary angiogram showed left main and triple vessel diseases. Pre-operative echocardiography confirmed good left ventricle ejection fraction (60-65%). CABG procedure was performed with a long saphenous vein (LSV) to obtuse marginal (OM) branch and left internal mammary artery (LIMA) to left anterior descending (LAD) artery. Intra-operative transit-time flow measurement showed satisfactory flow to both LSV and LIMA grafts. Weaning from the cardiopulmonary bypass (CPB) was uneventful. The patient returned to cardiac care unit (CCU) in a stable condition with continuous low dose noradrenaline infusion. Patient was kept intubated in CCU. Patient's blood pressure was on high side and therefore systemic intravenous Glyceryl trinitrate (GTN) infusion was started at low dose.

2 hours after operation, patient developed sudden cardiac arrest with unmeasurable blood pressure. Cardiac monitoring showed ventricular fibrillation (VF). Shock was given and cardiopulmonary resuscitation (CPR) was initiated immediately. Bedside sternotomy was performed, and internal cardiac massage was carried out. There was no obvious bleeding or oozing from cardiac surface or suture lines. There was no sizeable pericardial effusion. Cardiac activity returned after 18 minutes of CPR. IABP was inserted via left femoral artery for hemodynamic support.

Patient was transferred to operating theatre for central VA ECMO (Veno-arterial Extracorporeal Membrane Oxygenation) as peripheral VA ECMO was contraindicated due to severe PVD. Intra-op TEE showed global hypokinesia especially at inferior and apex region. Transit-time flow measurement showed flow rate of 70mL/min for LIMA graft with a PI of 2.4, and flow rate of 86mL/min for LSV graft with a PI of 2.9.

Coronary angiogram after stabilization showed diffuse spasm all three native major coronary arteries (LAD, LCx, RCA), demonstrated competitive flow. All

three native coronary arteries responded to GTN infusion. Two bypass graft (LSV and LIMA) was patent.



Left – coronary angiogram showing spasm of right coronary system

Right – coronary angiogram showing relieve of spasm of right coronary system, responsive to GTN infusion

The coronary artery spasm improved with continuous GTN infusion. IABP was later removed, Serial echocardiogram showed gradual improvement in left ventricular ejection fraction (LVEF), with down trending cardiac enzymes. IABP was removed and patient was discharged to high dependency unit (HDU) and subsequently to general cardiothoracic ward. Patient was discharged on postoperative day 15.

II. DISCUSSION

This case illustrates coronary artery spasm, an uncommon post-CABG condition. Literature reviewed was carried out for case reports post CABG coronary artery spasm. The incidence was reported to be between 0.8 % - 1.3% among all CABG patients [1]. It has an extremely high mortality and morbidity. It may occur anytime intra-operatively or immediate post-operative. It may involve native coronary arteries or manipulated bypass grafts [2]. RCA is most commonly involved

It is still unclear on the actual etiology of coronary artery spasm after CABG, but literature review proposes several factors to be the culprit: oxidative stress, vascular damage, high levels of vasoconstrictors, electrolyte disturbances, hypothermia, hypocapnia, pre-operative use of anti-hypertensives, and paradoxically high dose of nitroglycerine[3].

Coronary artery spasm is most commonly presented as ST segment elevation, hemodynamic instability and arrhythmias. Often the first sign of presentation is immediate cardiac arrest with VF[3]. The standard for diagnosis is coronary angiogram[4], demonstrating diffuse coronary artery spasm responsive to intravenous injection of vasodilator agents.

Several pre-operative measures were also proposed to avoid coronary artery spasm: avoid excessive manipulation of heart, avoid hypothermia, avoid excessive use of carbon dioxide in deair procedure (inducing vasoconstriction). Management options include conventional vasodilators, especially calcium channel blockers [3]. Some researchers also propose the usefulness of fasudil, a Rho-kinase inhibitor, in intractable severe coronary artery spasm after CABG resistant to conventional vasodilators [5].

Our patient is fortunate to survive with minimal organ dysfunction and minimal functional impairment. We must be aware of this rare but extremely high mortality post CABG condition, and to act immediately.

Conflict of interests: The authors declare no conflict of interest.

REFERENCES RÉFÉRENCES REFERENCIAS

1. Unai S, Hirose H, Cook G, Lee Y, Miura S, Kigawa I, Fukuda S, Miyairi T. Coronary artery spasm following off-pump coronary artery bypass surgery. *Int Heart J* 2014; 55: 451-454.
2. Lorusso R, Crudeli E, Lucà F, De Cicco G, Vizzardi E, D'Aloia A, Gelsomino S. Refractory spasm of coronary arteries and grafted conduits after isolated coronary artery bypass surgery. *Ann Thorac Surg* 2012; 93: 545-551.
3. Baek JH, Han SS, Lee DH. Native coronary artery and grafted artery spasm just after coronary artery bypass grafting: a case report. *J Korean Med Sci* 2010; 25: 641-643.
4. Hosoba S, Suzuki T, Takashima N, Kinoshita T, Kuryanagi S, Nota H, Asai T. Successful management of refractory lethal coronary spasm

- after off-pump coronary bypass grafting. *Ann Thorac Cardiovasc Surg* 2012; 18: 359-362.
5. Inokuchi, K., Ito, A., Fukumoto, Y., Matoba, T., Shiose, A., Nishida, T., . . . Shimokawa, H. (2004). Usefulness of Fasudil, a Rho-kinase Inhibitor, to Treat Intractable Severe Coronary Spasm after Coronary Artery Bypass Surgery. *Journal of Cardiovascular Pharmacology*, 44(3), 275-277.



This page is intentionally left blank





GLOBAL JOURNAL OF MEDICAL RESEARCH: I
SURGERIES AND CARDIOVASCULAR SYSTEM
Volume 20 Issue 4 Version 1.0 Year 2020
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-4618 & Print ISSN: 0975-5888

The Evolution of Mitral Valve Repair in India

By Varun Bansal & A. Sampath Kumar

Abstract- This is a review of the evolution of Mitral valve repair in India. Because of the prevalence of Rheumatic heart disease in India most of the techniques have been developed for this etiology. There was a need to adapt these techniques for the poor patients in order to reduce cost .As a consequence this review does not allude to the commercially available rings. Also this review does not cover the areas of ischemic and degenerative Mitral regurgitation because these techniques were not developed in India and only a couple of publications mention results in these two etiologies.

Keywords: rheumatic heart disease, mitral regurgitation, mitral valve repair.

GJMR-I Classification: NLMC Code: WG 262, WG 210



Strictly as per the compliance and regulations of:



The Evolution of Mitral Valve Repair in India

Varun Bansal^α & A. Sampath Kumar^ο

Abstract- This is a review of the evolution of Mitral valve repair in India. Because of the prevalence of Rheumatic heart disease in India most of the techniques have been developed for this etiology. There was a need to adapt these techniques for the poor patients in order to reduce cost. As a consequence this review does not allude to the commercially available rings. Also this review does not cover the areas of ischemic and degenerative Mitral regurgitation because these techniques were not developed in India and only a couple of publications mention results in these two etiologies.

Keywords: rheumatic heart disease, mitral regurgitation, mitral valve repair.

I. THE BEGINNING

Closed Mitral valvotomy (CMV): Mitral Valve surgery came to India in the early 50's, Reeve Betts and Gopinath in Vellore^{1,2} Leigh Collis in Aundh near Pune and PK Sen in Bombay began to perform CMV with immense success. Although confined to Rheumatic Mitral Stenosis it was an operative procedure easily applicable to most patients. Rheumatic Heart Disease (RHD) was rampant and the leading cause of mitral valve disease. Patients with significant Mitral regurgitation (MR) had to wait longer to be treated by surgery^{3,4}.

II. MITRAL VALVE REPLACEMENT (MVR)

It was in early 60's that open heart surgery become possible. Christian medical college (CMC), Vellore 3,4,5, King Edward memorial (KEM) hospital in Bombay, Madras Medical College in Chennai, All India Institute of Medical Sciences (AIIMS)6,7 in Delhi and few other centres began MVR for Rheumatic mitral regurgitation⁷. This step actually began the procedure of MV surgery. Surgeons from KEM in Bombay and AIIMS in Delhi began a program of stented homograft MVR. The stents were imported and cadaver Aortic valves were carefully sutured and used as substitute for the mitral valve. It was evolutionary and also revolutionary since it helped these poor patients by reducing the expense as well as avoiding anticoagulation. It was only applicable to patients with isolated mitral valve disease (MS or MS+MR). Patients with additional Aortic valve disease could not benefit from these stented valves.

Author α: MBBS DNB, Department of Cardiac Surgery, Medanta-The Medicity, Gurugram. e-mail: varunglbansal@gmail.com

Author ο: MCH Retd. Prof & Head, Chief CT Centre, AIIMS, Delhi, Senior Consultant, Max Hospital, Vaishali.

III. MITRAL VALVE REPAIR

Realising the hardships of patients, especially children and adolescents, women in child bearing age, few surgeons introduced mitral valve repair (1968) in highly selected patients. Dr. Gopinath in Delhi and Nemish Shah, and K N Dastur in Bombay Began to repair the MV in a few patients. There was no Echocardiography and on table and postoperative assessment depended on intuition, clinical examination and immediate postop left atrial (LA) pressure tracing. The results were quite unpredictable and unsatisfactory. In the late 70's M mode Echocardiography became available for assessment of the mitral regurgitation pre and postoperatively. This actually dampened the enthusiasm for repair since the results appeared unsatisfactory. The techniques used were only the Wooler Commissural plication and a circular suture (akin to the DeVega Technique). The Duran and Carpentier annuloplasty rings were expensive. Surgeons in Bombay used a piece of Teflon felt to mould the posterior mitral annulus with limited success in selected patients.

The introduction of 2D and Doppler Echocardiography in the early 80's made the assessment of mitral regurgitation more accurate. It also provided additional and vital information on MV morphology such as thickening, prolapse, rupture of chordae and perforation in endocarditis. Mitral regurgitant jets were visible and degree of MR could be assessed more accurately. Surgeons were now more careful in selection of patients for MV repair and postoperative assessment was more frequently performed non-invasively.

The MV Repair program took a giant leap in the year 1982 at AIIMS⁸⁻¹⁶. Expertise in Echocardiography combined with a modified Denton Cooley technique (C ring annuloplasty) in addition to other Carpentier techniques of cleft suture, chordal shortening/transfer improved the results greatly. Cardiologists who were reluctant to refer patients for repair were now more enthusiastic and recommended repairs. Postoperative Echo assessment and careful follow up of these patients added to the enthusiasm to repair the Mitral¹⁷⁻²⁴, Tricuspid and even the Aortic valves in patients with RHD²⁵⁻²⁸.

A second technical procedure introduced at the AIIMS, of Cusp thinning¹⁹ by peeling off the fibrous layer of deposit from the Anterior Mitral Leaflet (AML) and Posterior Mitral Leaflets (PML) made the leaflets larger, thinner and more pliable providing a more successful correction of MR with better co-optation.

Another simple technique for Chordal shortening at the cusp level proved useful in correcting prolapsed chordae 21.

By 1990, Trans Oesophageal Echo27 (TEE) was introduced and proved extremely useful in on table assessment of morphology, severity of regurgitation and assess the effects of the above technical modification. Postoperative assessment on table improved the learning and correction of residual MR at one operation 14,27-29. This reduced the complications and satisfied the cardiologists in the postop assessment. MV repair had reached the goal of a routine procedure and was taught to residents in training.

Workshops, Video clips, live demonstrations and publication of good results extended to children, adolescent and childbearing women encouraged surgeons to learn and apply these techniques. It benefitted a large number of patients by reducing cost, improving survival, avoiding anticoagulation and its consequences for up to 15-20 years following the procedure.

MV repair had come to stay. Patients are seeking repair and surgeons are applying these techniques both in India and abroad. South East Asian surgeons are recognised the world over 30-35as experts in repair of rheumatic mitral valves.

Ethical statement: Not applicable

REFERENCES RÉFÉRENCES REFERENCIAS

1. Closed mitral valvotomy in young patients. Cherian G, Vytillingam KI, Sukumar IP, Gopinath N. *Brit. Heart J* 1964;26: 157-166.
2. Closed mitral valvotomy: early results and long-term follow-up of 3724 consecutive patients. John S, Bashi VV, Jairaj PS, Muralidharan S, Ravikumar E, Rajarajeswari T, Krishnaswami S, Sukumar IP, Rao PS. *Circulation*. 1983 Nov;68(5):891.
3. Cardiac valve surgery--the "French correction". Carpentier A. *J Thorac Cardiovasc Surg* 1983 Sep; 86(3):323.
4. Reconstructive surgery of mitral valve incompetence: ten-year appraisal. Carpentier A, Chauvaud S, Fabiani JN, et al. *J Thorac Cardiovasc Surg*. 1980;79(3): 338-348.
5. John S, Krishnaswami S, Jairaj PS, Cherian G, Muralidharan S, Sukumar IP. The profile and surgical management of mitral stenosis in young patients. *J Thorac Cardiovasc Surg*. 1975;69(4).
6. Early and late results of Valve replacement using Bjork Shiley Valves. P.Venugopal, I.M.Rao, Sampath Kumar A, B.Airan, B.Das, K.S.Iyer, U.Kaul, H.S.Wasir, M.Rajani, M.L.Bhatia and N.Gopinath. *Proceedings of the world conference on open heart surgery, Bombay Eds-K.R.Shetty and G.B.Parulkar, McGraw Hill, 1985, PP161-165.*
7. The Bjork Shiley Valve: Long term experience in India. K.S.Iyer, P.Venugopal, I.M.Rao, Sampath Kumar A, B.Das, M.L.Bhatia, M.L.Sharma, K.S.Reddy, H.S.Wasir and N.Gopinath. *Thai J.Surg.* 8:193-196, 1987.
8. Mitral Valve Reconstruction: Early Results of a Modified Cooley Technique. Sampath Kumar A, R.V.Kumar S.Shrivastava, P.Venugopal, A.K. Sood, N. Gopinath. *Texas Heart Inst J* 1992; 19: J 107-11.
9. Mitral Valve Repair: Techniques and Results. A.Sampath Kumar, Anil Bhan, Rajiv Bajaj, S.Lokeshwar Rao, P.Venugopal and Savitri Srivastava. *Indian Heart J.* 42: 135-137, 1990.
10. Surgery of rheumatic heart disease in children Essential aspects. A sampath kumar. *IAP J Prac Paed*, 1997;52.
11. Mitral valve repair in predominantly rheumatic population: Long term result. SK Choudhary et al. *Texas Heart Inst J*, 2001; 28:8-152.
12. Mitral Valve Reconstruction: Intermediate Term Results in Rheumatic Mitral Regurgitation. A. Sampath Kumar, Pantula N. Rao. *The J Heart Valve Disease* 1994; 3: 161-164.
13. Mitral valve reconstruction in children with Rheumatic Heart Disease. Sampath Kumar A, Rao PN, Saxena A. *Ann of Thorac Surg*, 1995, 60: 1044-47.
14. Mitral Valve Reconstruction: Eight years experience in 531 patients: Sampath Kumar A, P.N. Rao, Anita Saxena. *J Heart Valve Dis.* 1997; 6:591-593.
15. Mitral valve repair in a predominantly rheumatic population: Long term results SK Choudhary, Sachin Talwar, B Dubey, A Chopra, A Saxena, Sampath Kumar A. *Texas Heart Inst J* 2001; 28:8-15.
16. Mitral valve repair in children with rheumatic heart disease Sachin Talwar, Manithara Raman Rajesh, Anandaraja Subramanian, Anita Saxena, Sampath Kumar A. *The J Thorac and Cardiovas Surg* 2005; 129:875-79.
17. Valvular heart surgery: repair or retain. A Sampath kumar. *Ind J of Thorac and cardiovasc Surg* 2000; 16;1:1:8-10.
18. Results of mitral valve repair in rheumatic mitral regurgitation Sampath Kumar A, Sachin Talwar, Anita Saxena, Rajvir Singh and Devagourou Velayoudam *Interact Cardiovasc Thorac Surg* 2006; 5:356-361.
19. Restoration of Pliability to Mitral leaflets during reconstruction. Sampath Kumar A, P.N. Rao. *The J Heart Valve Disease*, 1995. 4:251-253.
20. Repair of rheumatic mitral regurgitation in children. Kumar AS. *Ann Pediatr Cardiol.* 2011 Jan;4(1):47-52
21. Cusp-Level Chordal Shortening for Rheumatic Mitral Regurgitation. A. Sampath Kumar, Anil Bhan, R.V.Kumar, S.Shrivastava, A.K.Sood and N.Gopinath. *Texas Heart Inst J* 1992, 19; 47-50.

22. Long-term results of cusp level chordal shortening for anterior mitral leaflet prolapsed. John Santosh Kumar Murala Et al. *Texas HIJ* 2004;31(3):246-50.
23. Mitral valve repair in children with rheumatic heart disease. Sachin talwar et al. *The Journal of thorac & cardiovasc Surg* 2005; 129:875-79.
24. Results of mitral valve repair in rheumatic mitral regurgitation. A sampath kumar et al. *Interact Cardiovasc Thorac Surg* 2006; 5:356-361.
25. Repair of rheumatic mitral regurgitation in children. A S kumar. *Ann Pediatr Cardiol* 2011; 4(1):47-52.
26. Aortic Valve Repair : Technique and Results A. Sampath Kumar, Prashant Gundane. *Asian Cardiovasc & Thorac Annals*, 1994; 2:75.
27. Intraoperative transoesophageal echocardiography (ITEE) in mitral valve surgery. Sampath Kumar A, Saxena A *Ind J Thorac Cardiovasc Surg*; 2009; 25:107-111.
28. Aortic valve repair for rheumatic aortic valve disease. Sachin Talwar, Cheemalapati Saikrishna, Anita Saxena, Sampath Kumar A. *Ann Thorac Surg* 2005; 79:1921-25.
29. Anterior mitral leaflet length: predictor for mitral valve repair in a rheumatic population. Gupta A, Gharde P, Kumar AS. *Ann Thorac Surg*. 2010 Dec; 90(6):1930.
30. Rheumatic mitral valve repair: Experience of 221 cases from central chest institute of Thailand. Chotivatanapong T, Lerdsomboon P, Sungkahapong V. *J Med Assoc Thai*. 2012; 95(suppl 8): S51-S57.
31. Comparative long-term results of mitral valve repair in adults with chronic rheumatic disease and degenerative disease: Is repair for "burnt-out" rheumatic disease still inferior to repair for degenerative disease in the current era? Dillon J, Yakub MA, Kong PK, Ramli MF, Jaffar N, *J Thorac Cardiovasc Surg* 2015;149:771-9.
32. Surgical options in rheumatic mitral valve disease in children: a surgeon's perspective. A S Kumar. *World J Pediatr Congenit Heart Surg* 2014;5(1):80-4.
33. *Techniques in Valvular Heart Surgery*: Ed: A.Sampath kumar, 2nd Ed, 2009, CBS publishers, New Delhi.
34. *Cardiology*: Ed M Khalilullah, The Heart Centre, 2018, New Delhi.
35. *Master techniques: Cardiac surgery*. Grover F & Mack MJ Eds. Wolters Kluwer, 1st Ed, 2016.

This page is intentionally left blank





GLOBAL JOURNAL OF MEDICAL RESEARCH: I
SURGERIES AND CARDIOVASCULAR SYSTEM
Volume 20 Issue 4 Version 1.0 Year 2020
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-4618 & Print ISSN: 0975-5888

Cataract Surgery in Highly Myopic Eyes

By Fatine El Alami, Rayad Rachid, Imane Adnane, Salma Chikhaoui, Adil Mchachi,
Laila Benhmidoune, Abderrahim Chakib & Mohamed Elbelhadji

Abstract- Myopia affects approximately 25% of the population. High myopia is defined by a refractive error of more than -6D or an axial length of more than 26 mm (1-3), it is accompanied by degenerative changes in the eye tissues. It is recognized as a risk factor for the onset of cataracts. (4)

Our present work aims to assess the difficulties, peculiarities, and complications of cataract surgery in highly myopic eyes.

Materials and methods: We conducted a prospective comparative study, were included 79 highly myopic patients scheduled for cataract surgery (LA > 26 mm) and 80 patients candidates for cataract surgery as a control group. Patients with pseudo-exfoliation, glaucomatous syndrome, operated for retinal detachment, or with a history of uveitis were excluded. Statistical analysis was performed by SPSS software.

Keywords: cataract, phacoemulsification, high myopia.

GJMR-I Classification: NLMC Code: WW 168



Strictly as per the compliance and regulations of:



© 2020. Fatine El Alami, Rayad Rachid, Imane Adnane, Salma Chikhaoui, Adil Mchachi, Laila Benhmidoune, Abderrahim Chakib & Mohamed Elbelhadji. This is a research/review paper, distributed under the terms of the Creative Commons Attribution-Noncommercial 3.0 Unported License (<http://creativecommons.org/licenses/by-nc/3.0/>), permitting all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

Cataract Surgery in Highly Myopic Eyes

Fatine El Alami ^α, Rayad Rachid ^σ, Imane Adnane ^ρ, Salma Chikhaoui ^ω, Adil Mchachi [¥],
Laila Benhmidoune [§], Abderrahim Chakib ^x & Mohamed Elbelhadji ^v

Abstract- Myopia affects approximately 25% of the population. High myopia is defined by a refractive error of more than -6D or an axial length of more than 26 mm (1-3), it is accompanied by degenerative changes in the eye tissues. It is recognized as a risk factor for the onset of cataracts. (4)

Our present work aims to assess the difficulties, peculiarities, and complications of cataract surgery in highly myopic eyes.

Materials and methods: We conducted a prospective comparative study, were included 79 highly myopic patients scheduled for cataract surgery (LA> 26 mm) and 80 patients candidates for cataract surgery as a control group. Patients with pseudo-exfoliation, glaucomatous syndrome, operated for retinal detachment, or with a history of uveitis were excluded. Statistical analysis was performed by SPSS software.

Results: The mean age was 59 ± 9.26 years in the case group and 69.82 ± 10.47 in the control group and for the control group. For highly myopic eyes, the mean axial length was 28.35 ± 1.77 and the mean power of IOL 6.27 ± 6.26 . Nuclear cataract was more common in the case group compared to the control group. The duration of the procedure as well as the peroperative complications were comparable between the two groups. After an average follow-up period of 15,8 months, 32% of highly myopic patients required using the YAG laser for secondary cataract, 3 cases of retinal detachment were identified in the highly myopic group, and only one case in the control group.

Discussion: High myopia is a risk factor for the occurrence of cataracts. Its early onset has been confirmed by numerous studies. Cataract surgery in highly myopic eyes can be difficult for various reasons including the implant calculation which can be imprecise, the higher risk of complications during retro and peribulbar anesthesia, zonular fragility as well as the increase of the depth of the anterior chamber. Postoperatively, high myopic people have a higher risk of retinal detachment.

Conclusion: Despite the modern techniques and technologies of cataract surgery, high myopia represents a challenge for surgeons at the different stages of treatment. It is essential to take pre- and intraoperative precautions, as well as postoperative monitoring.

Keywords: cataract, phacoemulsification, high myopia.

I. INTRODUCTION

High myopia is defined by a refractive error of more than -6D or an axial length of more than 26 mm. it affects about 2% of the population (5), it is accompanied by degenerative changes in eye tissue. It's also a risk factor for cataract formation. Cataract surgery in highly myopic eyes is a technical and refractory challenge for the surgeon (6), it's characterized by the precocity of its onset, the difficulties of its perioperative management, as well as the high risk of retinal detachment.

The aim of our study is to analyze the epidemiological and clinical profile and to assess the different peculiarities in the surgical management of cataracts in highly myopic eyes; as well as post-operative complications.

II. MATERIALS AND METHODS

We conducted a prospective comparative study in our department, Were included in this study: 159 candidates for cataract surgery: 79 patients with high myopia (HM) with LA> 26mm (We chose axial length as the parameter because a nuclear cataract with a normal axial length and a normal keratometric value can result in refractive myopia), and 80 non-high myopic (non-HM) patients as a control group. We excluded patients with pseudo-exfoliative syndrome, followed for degenerative vitreoretinal pathologies or with a history of posterior segment surgery, eye trauma or uveitis. When both eyes of a patient were involved, one eye was selected randomly. all patients underwent a complete ophthalmologic examination, measurement of keratometry, and a B-mode ocular ultrasound (Fig 1) with measurement of axial length. The implant calculation was done by the SRK-T formula and phacoemulsification was performed by the centurion® device. The average duration of follow-up was 15 months. Statistical analysis was performed by SPSS software, student's t-test was used to compare data between cases and controls, a p-value of <0.05 were deemed to be statistically significant.

Author ^α ^σ ^ρ ^ω [¥] [§] ^x ^v: Adult Ophthalmology department - 20 Août
1953 Hospital/Ibn Rochd university hospital Faculty of medicine and
pharmacy- Hassan II university- Casablanca.
e-mail: fatineelalamii@gmail.com

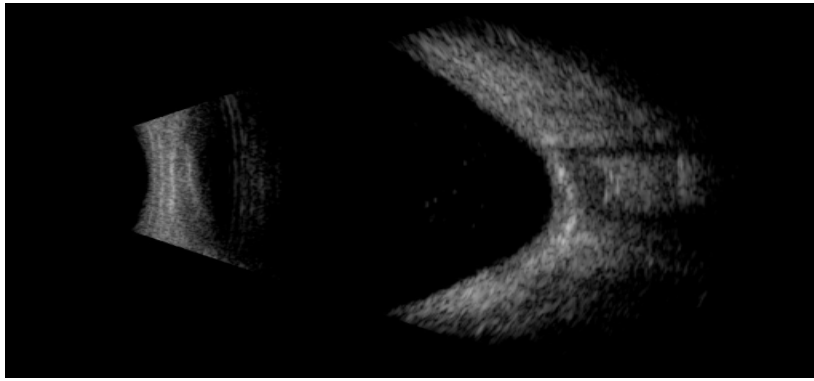


Figure 1: B-mode ocular ultrasound of a highly myopic eye

III. RESULTS

Regarding the results, the case group included 79 patients and the control group 80. The mean age in the case group was 59 ± 9.26 years and 69.82 ± 10.47 years for the control group, this difference was statistically significant ($p: 0.001$), for the distribution of

patients according to the groups of age (Fig 2), we note the younger age of HM group (including subjects who underwent cataract surgery in their thirties), the majority were aged between 50 and 60 years, while for the control group most of the patients were aged between 60 and 70 years.

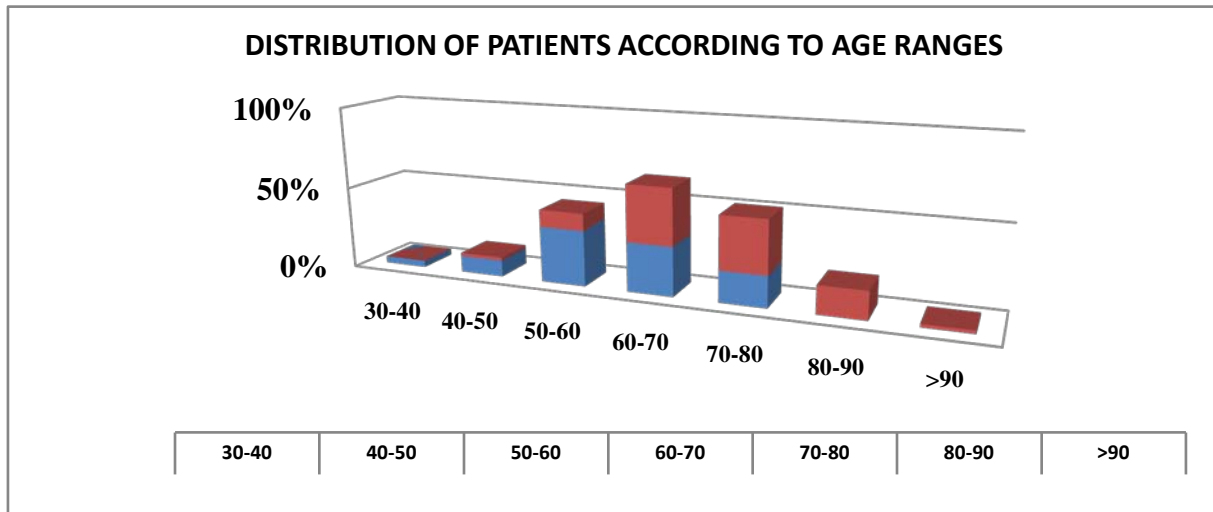


Figure 2: Distribution of patient according to age ranges in the case and the control group

In the HM group, men represented 40% compared to 50% in the control group. The best preoperative visual acuity was $<1/10$ in 82% of cases for severely myopic and in 75% of cases for the control population.

The mean axial length and power of IOL were 28.35 ± 1.77 mm and 6.27 ± 6.26 D (varying from -10 to 13 D), respectively, in the case group, and 22.76 ± 1.15 mm and 21.83 ± 2.52 D, respectively, in the control group (table1);

Table 1: Axial length and implant power of the case group and the control group

	HM	Non-HM	p
Axial length	$28,35 \pm 1,77$	$22,76 \pm 1,15$	P: 0.001
Power of IOL	6.27 ± 6.26	$21,83 \pm 2.52$	P: 0.001

Peribulbar anesthesia was performed for 72 patients, sub-tenon's anesthesia for 6 cases and general anesthesia for 1 case. Intraoperative complications represented 11% of our study group and 7.5% of the control group. The difference between the groups was not statistically significant (Table 2)

Table 2: Intraoperative complications for the case and the control groups

	HM	Non-HM	P
Posterior capsular rupture	7.5%	5%	0.73
zonular dehiscence	3.7%	2.5%	0.81
anterior vitrectomy	5,06%	3.75%	0.90
No primitive implantation	2,4%	1,25%	0.62

With regard to postoperative complications, there were 3 cases of retinal detachment, of which 2 eyes presented an intraoperative complication such as posterior capsular rupture, only 1 case of retinal detachment was identified in the control group.

secondary cataract requiring the use of the YAG laser was more frequent in highly myopic eyes (32%) compared to the control population (23%), this difference was statistically significant (Table 3)

Table 3: Postoperative complications for the case and the control group

	HM	Non-HM	P
Retinal detachment	3	1	<0.001
Secondary cataract (yag)	26	19	0.039
implant decentring	2	0	0.813

IV. DISCUSSION

High myopia is a risk factor for the onset of cataracts (7,8). Earliness of onset has been confirmed by numerous studies, generally 10 years younger than emmetrope. Our results match those of the literature [9,10], the average age of our highly myopic patients was 59 years compared to 69 years for the control group. A laboratory-based study identified a relationship between lipid peroxidation and myopic cataracts [11]. An animal study has also shown a correlation between the degree of retinal lipid peroxidation and lens opacity in rodents [12]. These studies provide a possible explanation for the association between high myopia and cataracts; damage to rodouter segments in high myopia results in products that induce cataracts.

In evaluating the highly myopic patient, several aspects apart from the routine cataract assessment should be noted. A detailed pastocular history is important, as previous refractive surgery, or intraocular contact lens or phakic intraocular lens implants, or retinal problems.

During the preoperative evaluation, the clinical examination must be rigorous to detect foreseeable intraoperative difficulties; special attention must be paid to the fundus analysis if the passage allows it. The calculation of the power of the implant is the second main issue in this preoperative assessment. It can be imprecise in the presence of a posterior staphyloma

which requires an ultrasound measurement in B mode(13), the increments can pass to 1 diopter (D) in the low powers, in particular for implants with negative diopters (14), the refractive target must be well specified with the patients preoperatively, since some of them want to keep residual myopia and favor near vision without glasses.

For intraoperative difficulties, we find the higher risk of perforation during retro and peribulbar anesthesia (15), zonular fragility, the increase in the depth of the anterior chamber as well as the inverse pupillary block or the lens-iris diaphragmretropulsion syndrome: it corresponds to the retropulsion of the irido-cristalline complex during phacoemulsification, it is characterized by a deepening of the anterior chamber, a significant pupillary dilation and a concavity of the iris when the irrigation is introduced, it is due to the zonular fragility and to underdevelopment of the ciliary body of the highly myopic patients(14), this peculiarity complicates surgery by deepening the anterior chamber and causing pain to the patient.

In our series: the rate of posterior capsular rupture observed (7.5%) agrees with the results of the literature: varying from 2.8 for Zuberbuhler et al. (16) to 9.5% for Orchi et al. (17), slightly higher compared to the control group (5%). However, the difference between the group of cases and the control group was not statistically significant (p: 0.73).

Postoperatively, after a mean follow-up period of 15.8 months, retinal detachment occurred in 3.7% in the HM group compared to 1.25% in the control group, this difference was statistically significant, these results

suggest that retinal detachment occurs more frequently in highly myopic eyes after phacoemulsification, and is consistent with those obtained by soheet al. (18) as well as Ripandelliet al. (19). (table 4)

Table 4: Frequency of retinal detachment according to different studies

	HM	Non-HM	p
Our series	3,7%	1,25%	<0,001
Sohee et al	1,72%	0,28%	<0,001
Ripandelli et al	8%	1,2%	<0,001
Alio et al (20)	2,7%		

The use of YAG laser capsulotomy for secondary cataracts in highly myopic eyes ranges from 6.5% to 46.7% (21, 22).in our series it was used in 32.9% of cases for HM, and 23.75% of cases for the control group. (p: 0.039)

Indeed, the surgeon must face this challenge by adapting his surgical technique (23):

- Concerning anesthesia, the topical one is quite feasible, a deeper anesthesia such as a sub-tenon or peribulbar often offers better operating comfort for the surgeon and the patient,
- Prefer micro-incision <2.2 mm in 3 tunnel sections,
- Do not inject too viscous,

- Maximum Rhexis of 6 mm despite the larger dimensions of the eye,
- Reduce the height of the bottle to avoid deepen the anterior chamber further,
- In case of reverse pupillary block or Lens-iris diaphragmretropulsion syndrome (Fig3): slightly lift the iris using a spatula, cannula or sinskey hook to elevate the pupil margin to facilitate the passage of the BSS (24),
- Careful washing of the masses on a previously fragile capsule,
- Careful polishing of the posterior capsule

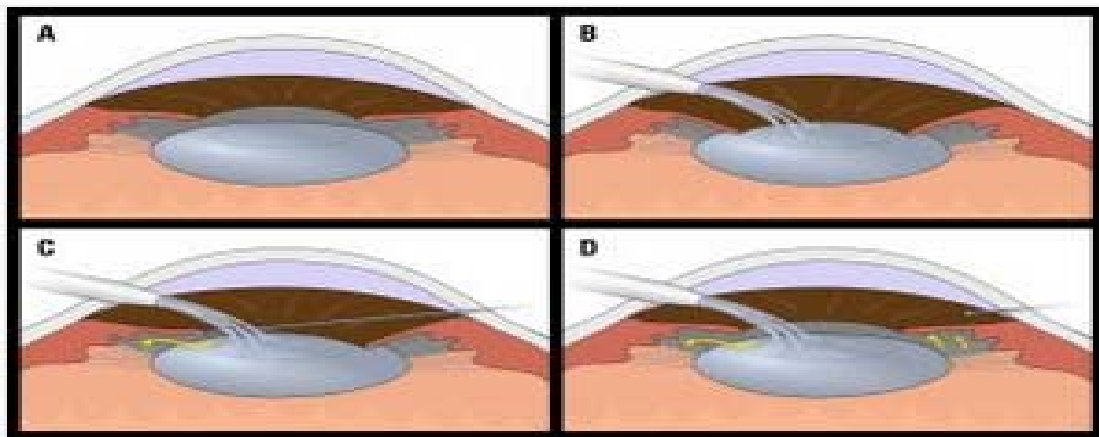


Figure 3: Lens-iris diaphragmretropulsion syndrome (LIDRS) (25)
 A, B: Infusion pushes iris against anterior capsule causing reverse pupillary block;
 C,D: Lifting the iris with a rod allows fluid to equilibrate between anterior and posterior chambers

V. CONCLUSION

Despite the modern techniques and technologies of cataract surgery, high myopia represents a challenge for surgeons at the different stages of treatment. It is essential to take pre- and intraoperative precautions, as well as postoperative monitoring.

Competing Interests

Authors have declared that no competing interests exist.

REFERENCES RÉFÉRENCES REFERENCIAS

1. Younan C, Mitchell P, Cumming RG, et al. Myopia and incident cataract and cataract surgery: the Blue Mountains Eye Study. Invest Ophthalmol Vis Sci2002; 43: 3625–3632

2. McCarty CA, Mukesh BN, Fu CL, Taylor HR. The epidemiology of cataract in Australia. *Am J Ophthalmol*1999; 128: 446–65.
3. Reeves BC, Hill AR, Brown NA. Myopia and cataract (Letter). *Lancet*. 1987; 2:964.
4. Kanthan GL, Wang JJ, Rochtchina E et al. Ten-year incidence of age-related cataract and cataract surgery in an older Australian population: the Blue Mountains Eye Study. *Ophthalmology*2008; 115: 808–14.
5. Basic Clinical and Science Course. *Retina and Vitreous*. 2013-14. Section 12 pg 85-86. Dodick, JM, Kahn JB. Special Considerations for Cataract Surgery in the Face of Pathologic.
6. Rapport SFO 2019 -Les myopies. https://www.sfo.asso.fr/files/files/Rapports/2019/les-myopies_second-rapport-sfo-2019.pdf. P 35.
7. Pan CW, Boey PY, Cheng CY, et al. Myopia, axial length, and age-related cataract: the Singapore Malayeye study. *Invest Ophthalmol Vis Sci*2013; 54:4498–4502.
8. Kanthan GL, Mitchell P, Rochtchina E, et al. Myopia and the long-term incidence of cataract and cataract surgery: the Blue Mountains Eye Study. *Clin ExpOphthalmol*2014; 42:347–353.
9. Praveen MR, Shah GD, Vasavada AR, et al. A study to explore the risk factors for the early onset of cataract in India. *Eye (Lond)* 2010; 24:686-94.
10. Kanthan GL, Wang JJ, Rochtchina E et al. Ten-year incidence of age-related cataract and cataract surgery in an older australian population: the Blue Mountains Eye Study. *Ophthalmology* 2008; 115: 808–14.
11. Micelli-Ferrari T, Vendemiale G, Grattagliano I, et al. Role of lipid peroxidation in the pathogenesis of myopic and senile cataract. *Br J Ophthalmol*1996; 80:840-3.
12. Zigler JS Jr, Bodaness RS, Gery I, Kinoshita JH. Effects of lipid peroxidation products on the rat lens in organ culture: a possible mechanism of cataract initiation in retinalde generative disease. *Arch BiochemBiophys*1983;225:149-56.
13. Zaldivar R, Shultz MC, Davidorf JM, Holladay JT. Intraocular lens power calculations in patients with extrememyopia. *J CataractRefractSurg*2000; 26: 668–674.
14. Rapport SFO 2019 -Les myopies. https://www.sfo.asso.fr/files/files/Rapports/2019/les-myopies_second-rapport-sfo-2019.pdf. P 36
15. High myopia and cataract surgery. American Academy of Ophthalmology. Practicing Ophthalmologists Learning System. <http://one.aao.org/pols-snippet/2217>. Accessed September 28, 2014.
16. Zuberbuhler B, Seyedian M, Tuft S. Phacoemulsification in eyes with extreme axial myopia. *J CataractRefractSurg*. 2009; 35(2):335-40.
17. T Ochi 1 , A Gon, Y Kora, K Kawai, Y Fukadolntraocular lens implantation and high myopia *J CataractRefractSurg*. 1988 Jul;14(4):403-8.
18. Sohee Jeon 1, Hyun Seung Kim. Clinical characteristics and outcomes of cataract surgery in highly myopic Koreans *Korean J Ophthalmol*.2011 Apr; 25(2):84-9.
19. Ripandelli G, Scassa C, Parisi V, et al. Cataract surgery as a risk factor for retinal detachment in very highly myopic eyes. *Ophthalmology*2003; 110:2355– 2361.
20. Jorge L Alio, José M Ruiz-Moreno, Mohamed H Shabayek, Francisco L Lugo, Ayman M Abd El Rahman. The risk of retinal detachment in high myopia after small incision coaxial phacoemulsification *Am J Ophthalmol* 2007 Jul.; 144(1):93-98.
21. Alldredge CD, Elkins B. Alldredge OC Jr. Retinal detachment following phacoemulsification in highly myopic cataract patients. *J CataractRefractSurg*1998; 24:777–780.
22. Fan DSP, Lam DSC, Li KKW. Retinal complications after cataract extraction in patients with high myopia. *Ophthalmology* 1999; 106:688–691; discussion by M Stirpe, 691–692.
23. Michaël A ssouline (P aris), Thierry Amzallag (Somain), Catherine Bour eau (P aris), Danielle D eidier(Hyères), Laurent Gauthier-Fournet (Saint-Jean-de-Luz), Gilles Lesieur (Albi), Pascal Pietrini (Nantes), Pas-calRozot (Marseille), Pierre-Yves Santiago (Nantes), Trucs et astuces pour la chirurgie cristallinienechez le myope fort, *CHIRURGIE DE LA MYOPIE FORTE* 222-227-OPHT16_DOSSIER5.qxp 30/06/08 18:39 Page 222.
24. High myopia and cataract surgery. American Academy of Ophthalmology. Practicing Ophthalmologists Learning System. <http://one.aao.org/pols-snippet/2217>. Accessed September 28, 2014.
25. Dr Soosan Jacob Phacoemulsification in high myopic eyes everything you ever wanted to know about phacoemulsification in high myopic eyes Friday, June 1, 2018EUROTIMESTORIES.



This page is intentionally left blank





GLOBAL JOURNAL OF MEDICAL RESEARCH: I
SURGERIES AND CARDIOVASCULAR SYSTEM
Volume 20 Issue 4 Version 1.0 Year 2020
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-4618 & Print ISSN: 0975-5888

The Relationship between Rheumatic Heart Disease and Coronary Artery Disease and its Implications

By Varun Bansal, Arkalgud Sampath Kumar, Amit Bathla, Gaurav Mahajan,
Ajeet Upadhyay, Sudha Rawat & Sanjay Goel

Abstract- Aim: This is a retrospective observational study from one institution. Between January 2011 and December 2017, it was observed that nearly all patients undergoing valve surgery for Rheumatic Heart Disease had normal coronaries. Through this study, we aim to identify the relationship between Rheumatic heart disease and Coronary Artery Disease.

Patients and methods: One hundred and seventy two patients with confirmed Rheumatic heart disease (Group A) were included in the study. All patients underwent coronary angiography. Significant coronary artery disease of any major coronary artery or branch was noted. Between January 2017 and December 2017, 710 patients (Group B) undergoing coronary angiography for suspected/symptomatic coronary artery disease were included as controls and compared to Group A patients. In group A the mean age of patients was 58.17 years. In-group B the mean age of patients was 59.4 years. Risk factors for coronary artery disease were comparable between both the groups. Significant coronary artery disease was observed in 12 (6.98%) patients in group A, and 550 (77.46%) patients in group B. This difference was statistically significant ($p < 0.0001$).

GJMR-I Classification: NLMC Code: WG 210



Strictly as per the compliance and regulations of:



© 2020. Varun Bansal, Arkalgud Sampath Kumar, Amit Bathla, Gaurav Mahajan, Ajeet Upadhyay, Sudha Rawat & Sanjay Goel. This is a research/review paper, distributed under the terms of the Creative Commons Attribution-Noncommercial 3.0 Unported License <http://creativecommons.org/licenses/by-nc/3.0/>, permitting all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

The Relationship between Rheumatic Heart Disease and Coronary Artery Disease and its Implications

Varun Bansal ^α, Arkalgud Sampath Kumar ^σ, Amit Bathla ^ρ, Gaurav Mahajan ^ω, Ajeet Upadhyay [¥],
Sudha Rawat [§] & Sanjay Goel ^x

Abstract- Aim: This is a retrospective observational study from one institution. Between January 2011 and December 2017, it was observed that nearly all patients undergoing valve surgery for Rheumatic Heart Disease had normal coronaries. Through this study, we aim to identify the relationship between Rheumatic heart disease and Coronary Artery Disease.

Patients and methods: One hundred and seventy two patients with confirmed Rheumatic heart disease (Group A) were included in the study. All patients underwent coronary angiography. Significant coronary artery disease of any major coronary artery or branch was noted. Between January 2017 and December 2017, 710 patients (Group B) undergoing coronary angiography for suspected/symptomatic coronary artery disease were included as controls and compared to Group A patients. In group A the mean age of patients was 58.17 years. In-group B the mean age of patients was 59.4 years. Risk factors for coronary artery disease were comparable between both the groups. Significant coronary artery disease was observed in 12 (6.98%) patients in group A, and 550 (77.46%) patients in group B. This difference was statistically significant ($p < 0.0001$)

Conclusion: This study reveals that patients with rheumatic heart disease have a lower incidence of coronary artery disease compared to another group of patients with identical risk factors for coronary artery disease but who do not have rheumatic heart disease. A prospective study in a larger cohort is clearly indicated.

I. INTRODUCTION

Cardiovascular diseases are the leading cause of death worldwide accounting for more than 17 million deaths annually. World Health Organization (WHO) estimates that India accounts for more than 20% of these deaths. In India, cardiovascular deaths amounted to 2.1 million in 2015, out of which 0.9 million (68.4%) were due to Ischemic heart disease.¹ Rheumatic heart disease (RHD) is another major cause of morbidity and mortality in developing countries like India² and it led to 47000 (3.5%) of all deaths in 2015.¹

The non-modifiable risk factors for coronary heart disease are age, gender, family history; and the modifiable factors are smoking or tobacco use in any form, known history of diabetes or hypertension or both, dyslipidemia and lifestyle habits such as obesity and physical inactivity.³ However, due to changing demographics and economics, the risk factors and natural history of subclinical RHD are not well known.²

Comparative studies on the incidence of coronary artery disease (CAD) in patients undergoing surgery for RHD are very few. Although there have been a few studies in which attempts were made to analyze the association of CAD with RHD from India,⁴⁻⁶ Chile,⁷ Nepal,⁸ Rio de Janeiro,⁹ the effect of RHD pathophysiology on the development of CAD has not been clearly understood so far. Many of these studies do not confirm the presence of RHD nor do they compare with the incidence of CAD. This study aims to analyze if and how RHD is related to CAD.

II. PATIENTS AND METHODS

All patients admitted for elective surgery for RHD at our hospital between 1st January 2011 and 31st December 2017 were included and compared with a larger cohort of patients undergoing elective coronary angiography (CAG) for suspected or symptomatic CAD, between 1st January 2017 and 31st December 2017.

a) Inclusion criteria for the study

For the patients to be included in either of the study groups, age more than 40 years and New York Heart Association (NYHA) functional classification stage III or IV with symptoms of angina, breathlessness, palpitations or fatigue were mandatory.

b) Exclusion criteria for the study:

Patients who had:

- Unstable angina.
- Recent myocardial infarction proved by ECG changes or cardiac biomarkers.
- History of previous percutaneous intervention for CAD or who underwent Coronary Artery Bypass Grafting surgery (CABG) in the past.

Author: e-mail: varunlbansal@gmail.com

- d) Poorly controlled diabetes mellitus with glycosylated hemoglobin (HbA1C) of more than 7%.
- e) Ischemic heart disease patients with severe left ventricular dysfunction and left ventricular ejection fraction (LVEF) less than 30% on transthoracic echocardiography.

Patients with congenital abnormalities like bicuspid aortic valve, those with degenerative valve disease, infective endocarditis, ischemic mitral regurgitation or myxomatous mitral valve were excluded from the study.

Diagnosis of RHD was made on the basis of involvement of mitral valve, with thickening and fusion, which in India is diagnostic of RHD in adult patients. Patients who previously underwent balloon mitral valvotomy (BMV), closed mitral valvotomy (CMV), mitral valve repair for RHD were also included. Patients who underwent Aortic valve surgery were included if surgical findings were suggestive of a tricuspid aortic valve and histopathological examination (HPE) was suggestive of thickening, fibrosis and inflammation of valve leaflets characteristic of RHD.

All patients underwent transthoracic echocardiography (TTE) for assessment of ventricular function and dimensions, valve morphology and function with quantification of gradients or regurgitation across the heart valves and presence/absence of any intra-cardiac lesion including left atrial (LA) or left atrial appendage (LAA) thrombus. Subsequently, all patients underwent elective CAG for screening for CAD before surgery for RHD or for suspected/ symptomatic CAD. Presence of significant CAD (percentage obstruction of luminal diameter more than 50% in any major or branch coronary artery of diameter more than 1.5mm¹⁰) was noted.

Patients were divided into two groups. Group A consisted of patients with RHD undergoing valve surgery and Group B consisted of patients undergoing elective CAG for symptomatic/suspected CAD. Presence of risk factors for CAD in the form of age, gender, history of smoking (more than 10 pack years of smoking history), history of DM, history of hypertension, family history of DM and family history of hypertension were noted for all the patients. All patients were of the same ethnicity.

Out of 318 patients who underwent elective surgery for RHD between the study period, 172 could meet the inclusion criteria of the study. They constituted group A of the study population. The mean age of group A patients was 58.17 + 9.58 years. 101 (58.72%) were males and 26 (15.12%) had a positive history of smoking. 56 (32.56%) patients had DM, and 67 (38.95%) had hypertension. In group A, 60 (34.88%) patients had a positive family history for DM and 76 (44.19%) patients had a positive family history for hypertension. Mean LVEF for Group A patients was 46.9 + 8.4%.

Trans Esophageal Echocardiography (TEE) was performed under anesthesia for all patients to re-assess morphology of the valves, quantification of regurgitant lesions, calcification, and presence/absence of LA or LAA thrombus. Surgery was performed under cardiopulmonary bypass (CPB) with normothermic perfusion and cold blood cardioplegia by a single surgeon. The excised valve specimen was sent for HPE. The respective involvement of valves and surgeries done on patients in Group A is as depicted in Table 1.

Table 1: Valve affected and surgical procedures performed on RHD patients

Valve affected	Surgery	Number of patients	Total number of patients for each valve
Mitral valve	Mitral valve replacement	49	81
	Mitral valve repair	15	
	Redo- mitral valve replacement	17	
Aortic valve	Aortic valve replacement	50	51
	Redo- aortic valve replacement	1	
Mitral+ Aortic valve	Double valve replacement	29	39
	Redo-double valve replacement	10	
Mitral + Aortic + Tricuspid valve	Double valve replacement with TV repair	1	1

All patients with significant CAD in-group A underwent concomitant coronary artery revascularization in the form of CABG along with surgery for RHD. Reversed saphenous vein grafts were used for all these patients. Distal anastomoses of grafts to coronary arteries were performed on CPB after delivering cardioplegia. Valve repair and/or replacement were done after distal anastomoses were performed. Proximal anastomoses of vein grafts to ascending aorta were performed on empty beating heart after removal of aortic cross-clamp. Patients were gradually weaned off CPB after valve surgery and coronary revascularization.

Between 1st January 2017 and 31st December 2017, 1054 patients underwent CAG for suspected/symptomatic CAD. Out of those 710 patients met the inclusion criteria. They constituted group B of the study population. The mean age of the study group patients was 59.4 + 11.02 years. 440 (61.97%) were males and 149 (20.99%) of all the patients had a positive history of smoking. 274 (38.59%) patients had DM, and 314 (44.23%) had hypertension. In group B 297 (41.83%) patients had a positive family history for DM and 348 (49.01%) patients had a positive family history for hypertension. Mean LVEF for Group B patients was 47.57 + 9.31%.

In-group B, 439 patients underwent percutaneous coronary angioplasty using coronary stent

and 111 patients underwent off-pump CABG surgery. All patients undergoing CABG received Left Internal Mammary Artery graft to Left Anterior Descending (LAD) and reversed saphenous vein grafts to obtuse marginal artery and/or posterior descending artery during the surgery.

Group A patients were further compared with the epidemiological studies on the incidence of coronary artery disease in the general population in India.

c) Statistical analysis

Categorical variables were presented in number and percentage (%) and continuous variables were presented as mean \pm SD and median. Normality of data was tested by Kolmogorov-Smirnov test. If the normality was rejected then the non-parametric test was used. Statistical tests applied were:

1. Quantitative variables were compared using the Mann-Whitney Test (as the data sets were not normally distributed) between the two groups.
2. Qualitative variables were correlated using the Chi-Square test. p-value of <0.05 was considered statistically significant. The data was entered in MS EXCEL spreadsheet and analysis was done using Statistical Package for Social Sciences (SPSS) version 21.0.

III. RESULTS

The risk factors and demographic data between both the groups were comparable (Table 2).

Table 2: Risk factors and demographic comparison of the two groups of patients

	Group A	Group B	p
Mean age	58.21	59.4	0.073
Males	112(59.57%)	440(61.97%)	0.548
Mean LVEF	46.84	47.57	0.077
Smokers	29(15.43%)	149(20.99%)	0.089
DM	60	274	0.092
HTN	71(37.77%)	314(44.23%)	0.112
Family – DM	65(34.57%)	297(41.83%)	0.071
Family – HTN	81(43.09%)	348(49.01%)	0.148

The number of patients with significant coronary artery disease was 12 (6.98%) in Group A and 550 (77.46%) in Group B (p 0.0001). In Group A, 160 (93.02%) patients, and in Group B 160 (22.54%) patients had normal coronary arteries.

Within group A, 81 patients underwent surgery for isolated mitral valve disease and significant CAD was found in 4 patients (4.9%), and 51 patients underwent surgery for isolated aortic valve disease, significant CAD was found in 7 patients (13.7%). Out of 39 patients who

underwent double valve replacement, 1 (2.5%) patient had significant CAD.

The distribution of CAD in arteries in both groups and the statistical comparison is depicted in Table 3.

Table 3: Distribution of significant CAD in both the groups

	LAD	LCx	RCA	LAD +LCx	LAD +RCA	LCx +RCA	TVD	Total patients with CAD	p
Group A	3	0	1	2	3	1	2	12	<.0001
Group B	96	65	82	59	52	36	160	550	

Incidence of coronary artery disease in India as reported by epidemiological studies was compared with the incidence of CAD in group A patients, and the comparison is as depicted in Table 4.

Table 4: Incidence of CAD in Group a patients versus general population in India

Author	Study site	Year reported	Sample size	Known CAD	Known CAD in Group A	p
Chadha SL ¹¹	Delhi	1990	13723	9.67%	6.98%	0.29
Krishnan MN ¹²	Multisite	2016	5167	12.5%	6.98%	0.04

IV. DISCUSSION

It is a retrospective observational study from a single center in India comparing incidence of CAD in symptomatic patients with or without RHD. In our study the incidence of CAD in symptomatic patients of RHD was 6.98%.

We believe it is necessary to have a demographically comparable group as a control in order to remove any bias. It may be argued that the two pathologies may be a coincidence rather than a pathologic relation. As mentioned in our limitations only further studies will throw a light on this, since both RHD and CAD are inflammatory in nature.

Various studies from India have found a similar incidence of CAD amongst RHD patients. Jadhav et al⁴ studied 757 patients undergoing intervention for valvular heart disease (not confirmed RHD) and found the overall incidence of CAD to be 9.1%. Thiyagarajan et al⁵ studied 101 patients undergoing preoperative CAG before undergoing valvular heart surgery for rheumatic mitral and aortic valve disease and found that 4 out of 43 (9.3%) patients undergoing surgery for mitral valve disease had significant CAD. However, they did not compare with the overall incidence of CAD. Jose et al⁶ studied 376 patients with RHD and found an overall incidence of CAD to be 12.2% amongst RHD patients. A few studies published in English literature have also reported similarly. Merchant et al⁷ from Chile studied 100 patients with RHD who underwent CAG and observed significant CAD in 3 patients (6.9%) out of 43 in patients with Rheumatic mitral valve disease. Sahi et

al⁸ from Nepal studied 97 patients with RHD and non-rheumatic valvular heart disease (VHD). They observed the incidence of CAD to be 12.2% in RHD patients and 37.5% in non-rheumatic VHD patients. Kruczan et al⁹ from Rio de Janeiro studied 294 patients and found the incidence of CAD to be 4% in RHD patients versus 33.61% in patients with non-rheumatic VHD (Table 5).

Table 5: Description of various studies published on incidence of CAD in RHD patients

Author	Published year	City/Country	Study type	Number of patients	Patients with RHD	Incidence of CAD in MV	Incidence in RHD	Incidence in non RHD
Jadhav et al ⁴	2016	Ahmedabad/India	Retrospective observational	757	757	7/69 (10.1%)	69 (9.1%)	No comparison with Non RHD
Thiyagarajan et al ⁵	2018	India	Cross-sectional observational	101	101	4/43 (9.3%)	23 (22%)	No comparison with non RHD
Jose et al ⁶	2004	Vellore/India	Prospective observational	376	376	13/96 (13.5%)	46 (12.2%)	No comparison with non RHD
Marchant et al ⁷	1983	Santiago/Chile	Prospective observational	100	100	3/43 (7%)	14 (14%)	No comparison with non RHD
Sahi R et al ⁸	2018	Kathmandu/Nepal	Retrospective comparative	97	57	Not checked	7/57 (12.2%)	15/40 (37.5%)
Kruczan et al ⁹	2008	Rio de Janeiro/Brazil	Cross-sectional	294	175	Not checked	7/175 (4%)	40/119 (33.61%)

It was noted that out of all the above, Jadhav et al⁴ and Kruczan et al⁹ have considered TTE findings of valve morphology as the diagnostic feature of RHD, however none of the other studies have mentioned how they have confirmed RHD in their patients. We have used TTE, TEE as well as HPE findings for the confirmation of RHD.

This is one of the highlights of this study. The results of our study when compared with multicentric epidemiological study in general Indian population by Krishnan et al¹² in which 5167 adults of mean age 51 years were studied, showed a significant difference in the incidence of CAD (6.98% versus 12.5%, $p = 0.04$).

The observation made is that, for reasons not yet known, there is a significant reduction in the incidence of CAD in patients with RHD especially mitral valve disease. Although not conclusive in this small group of RHD patients, this study gives some evidence and it appears that RHD reduces the incidence of CAD. Further prospective study on a larger cohort of patients might be helpful in rewriting the guidelines for preoperative coronary angiography in patients undergoing heart surgery for rheumatic heart disease.

V. LIMITATIONS OF THE STUDY

This is a retrospective study where hospital based population of symptomatic patients have been included and the number of RHD patients is not large. A prospective comparative study with larger number of RHD patients would probably confirm this observation.

ACKNOWLEDGEMENTS

We thank our colleagues from Max Super Specialty Hospital, who provided insight and expertise that greatly assisted the research. We sincerely thank Dr Gaurav Minocha and Dr Amit Malik for their contribution in treatment and care of the patients including performing coronary angiography and coronary angioplasty for the patients. We would also like to show our gratitude to the Ms Bhavana Gupta for her contribution towards statistical analysis and compilation of results.

Abbreviations

RHD	Rheumatic Heart Disease
CAD	Coronary Artery Disease
CAG	Coronary Angiography
DM	Diabetes Mellitus Type II
NYHA	New York Heart Association
CABG	Coronary Artery Bypass Grafting
LVEF	Left Ventricular Ejection
TTE	Trans-thoracic Echocardiography
TEE	Trans-esophageal echocardiography
LA	Left Atrium
LAA	Left Atrial Appendage
CPB	Cardiopulmonary bypass
LAD	Left anterior descending coronary artery
LCx	Left circumflex coronary artery
RCA	Right coronary artery
TVD	Triple vessel coronary artery disease
VHD	Valvular heart disease

REFERENCES RÉFÉRENCES REFERENCIAS

- Ke C, Gupta R, Xavier D et al. Million Death Study Collaborators. Divergent trends in ischaemic heart disease and stroke mortality in India from 2000 to 2015: a nationally representative mortality study. *Lancet Glob Health*. 2018; 6:e914–e923.
- Saxena A, Ramakrishnan S, Roy A, et al. Prevalence and outcome of subclinical rheumatic heart disease in India: The RHEUMATIC (Rheumatic Heart Echo Utilisation and Monitoring Actuarial Trends in Indian Children) study *Heart* 2011; 97:2018-2022.
- Reddy, K.S. & Yusuf, S. Emerging Epidemic of Cardiovascular Disease in Developing Countries. *Circulation*. 1998; 97:596-601.
- Nikhil D Jadhav, Kamal H Sharma, Komal H Shah, Ashwati Konat, Dhammdeep Humane, Sachin Patil. Incidence and clinical profile of coronary artery disease in patients with rheumatic heart disease undergoing valvular intervention. *Int J Med Res Rev* 2016; 4(10):1915-1920.
- Thiyagrajan K, Swaminathan N, Tamilselvan K. Coronary artery disease in patients with rheumatic heart disease – an angiographic study. *International Journal of Scientific Research*. 2018 July; 7(7): 72-73.
- Jose VJ, Gupta SN, Joseph G et al. Prevalence of coronary artery disease in patients with rheumatic heart disease in the current era. *Indian Heart J*. 2004 Mar-Apr; 56(2):129-31.
- Marchant E, Pichard A, Casanegra P. Association of coronary artery disease and valvular heart disease in Chile. *Clin Cardiol*. 1983 Jul; 6(7):352-6.
- Sahi, R., Sayami, A., Gajurel, R. et al. Prevalence and patterns of coronary artery disease in patients undergoing cardiac surgery for rheumatic and non-rheumatic valvular heart disease in a tertiary care center of Nepal. *Nepalese Heart Journal*. 2018; 15(2):21-24.
- Kruczan DD, Silva NA, Pereira Bde B, Romão VA, Correa Filho WB, Morales FE. Coronary artery disease in patients with rheumatic and non-rheumatic valvular heart disease treated at a public hospital in Rio de Janeiro. *Arq Bras Cardiol*. 2008 Mar; 90(3):197-203.
- Farooq V, Serruys PW, Garcia-Garcia HM et al. The negative impact of incomplete angiographic revascularization on clinical outcomes and its association with total occlusions: the SYNTAX (Synergy between Percutaneous Coronary Intervention with Taxus and Cardiac Surgery) trial. *J Am Coll Cardiol*. 2013 Jan 22; 61(3):282-94
- Chadha SL, Radhakrishnan S, Ramachandran K, Kaul U, Gopinath N. Epidemiological study of coronary heart disease in urban population of Delhi. *Indian J Med Res*. 1990; 92:424-30.
- Krishnan MN, Zachariah G, Venugopal K, et al. Prevalence of coronary artery disease and its risk factors in Kerala, South India: a community based cross sectional study. *BMC Cardiovasc Disord* 2016; 16:12.



GLOBAL JOURNAL OF MEDICAL RESEARCH: I
SURGERIES AND CARDIOVASCULAR SYSTEM
Volume 20 Issue 4 Version 1.0 Year 2020
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-4618 & Print ISSN: 0975-5888

To Study the Sensitivity and Specificity of Ankle Brachial Index in Diagnosis of Peripheral Arterial Disease in Diabetics with Coronary Artery Disease at a Large Tertiary Care Teaching Hospital

By Dr. Sajad Hussain Bhat, Dr. Adil Majeed, Dr. Mohd Yousuf Dar & Mohd Yousuf Dar

Abstract- The aim of study was to determine the sensitivity and specificity of ankle brachial index in diagnosis of peripheral arterial disease in diabetics with coronary artery disease at a teaching hospital in North India.

Materials and methods: All diabetic patients admitted with coronary artery disease who undergo coronary angiography irrespective of their presentation (stable angina, unstable angina, NSTEMI, STEMI) were included in the study. Systolic blood pressures of both arms at the brachial arteries and both lower limbs at the dorsalis pedis arteries were taken with the help of sphygmomanometer and a hand held doppler probe and recorded in the proforma. The higher of the two systolic pressures recorded at the ankle was divided by the highest of the systolic pressures recorded in the arms to get the ankle brachial index. The results of ABI were compared with peripheral angiography.

Keywords: ABI; ankle brachial Index; PAD; peripheral arterial disease.

GJMR-I Classification: NLMC Code: WG 210



Strictly as per the compliance and regulations of:



© 2020. Dr. Sajad Hussain Bhat, Dr. Adil Majeed, Dr. Mohd Yousuf Dar & Mohd Yousuf Dar. This is a research/review paper, distributed under the terms of the Creative Commons Attribution-Noncommercial 3.0 Unported License (<http://creativecommons.org/licenses/by-nc/3.0/>), permitting all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

To Study the Sensitivity and Specificity of Ankle Brachial Index in Diagnosis of Peripheral Arterial Disease in Diabetics with Coronary Artery Disease at a Large Tertiary Care Teaching Hospital

Dr. Sajad Hussain Bhat ^α, Dr. Adil Majeed ^σ, Dr. Mohd Yousuf Dar ^ρ & Mohd Yousuf Dar ^ω

Abstract- The aim of study was to determine the sensitivity and specificity of ankle brachial index in diagnosis of peripheral arterial disease in diabetics with coronary artery disease at a teaching hospital in North India.

Materials and methods: All diabetic patients admitted with coronary artery disease who undergo coronary angiography irrespective of their presentation (stable angina, unstable angina, NSTEMI, STEMI) were included in the study. Systolic blood pressures of both arms at the brachial arteries and both lower limbs at the dorsalis pedis arteries were taken with the help of sphygmomanometer and a hand held doppler probe and recorded in the proforma. The higher of the two systolic pressures recorded at the ankle was divided by the highest of the systolic pressures recorded in the arms to get the ankle brachial index. The results of ABI were compared with peripheral angiography.

Results: Among the total of fifty (50) patients in the study group 80% (n=40) had a normal peripheral angiography while 20% (n=10) had an abnormal angiography. Out of the affected patients 4% (n=2) had plaquing and 16% (n=8) had stenosis of the peripheral arteries. The sensitivity, specificity, positive predictive value and negative predictive value of ABI by hand held doppler apparatus was found to be 90%, 97.5%, 90% and 97.5% respectively.

Conclusion: Ankle Brachial Index is a useful non invasive diagnostic modality for peripheral artery disease in diabetic patients with concomitant coronary artery disease.

Keywords: ABI; ankle brachial Index; PAD; peripheral arterial disease.

1. INTRODUCTION

Measurement of ankle brachial index (ABI) is useful for detecting peripheral arterial disease (PAD) and identifying persons at risk for future atherothrombotic events. The likelihood of symptomatic progression of PAD is lower than succumbing to coronary artery disease (CAD). Approximately 75 – 80% of non diabetic patients who present with mild to moderate claudication remain symptomatically stable. Deterioration is likely to occur in the remainder with approximately 1 -2 % of the group ultimately developing critical limb ischaemia each year. Approximately 25–30% of patients with critical limb ischaemia undergo

amputation within one year. The prognosis is worse in patients who continue to smoke cigarettes or who have diabetes mellitus. Although much is known regarding PAD in general population the assessment and management of PAD in those with diabetes is less clear and possess some special issues. At present there is no established guidelines regarding the care of patients with both diabetes and PAD¹. The highest prevalence of atherosclerotic PAD occurs in the sixth and seventh decades of life. The true prevalence of PAD in people with diabetes has been difficult to determine as most patients are asymptomatic, many do not report their symptoms, screening modalities have not been uniformly agreed upon, and pain perception may be blunted by the presence of peripheral neuropathy. For these reasons a patient with diabetes and PAD may be more likely to present with an ischemic ulcer or gangrene than a patient without diabetes. While amputation has been used by some as a measure for PAD prevalence, medical care and local indication for amputation versus revascularisation of the patient with critical limb ischemia widely vary. Thus amputation may be an imprecise measure of PAD.

The reported prevalence of PAD is also affected by the methods by which the diagnosis is sought. Two commonly used tests are the absence of peripheral pulses and the presence of claudication. Both however suffer from insensitivity. A more accurate estimation of the prevalence of PAD in diabetes should rely upon a validated and reproducible test. Such a test is the ankle brachial index (ABI) which involves measuring the systolic pressure in the ankles (dorsalis pedis and posterior tibial arteries) and arms (brachial arteries) using a hand held doppler and then calculating the ratio. Simple to perform it is non invasive, quantitative measurement of the patency of the lower extremity arterial system. Compared with an assessment of pulses or a medical history the ABI has been found to be more accurate. It has been validated against angiographically confirmed disease and found to be 95% sensitive and almost 100% specific²⁻⁴. ABI also serves as a marker of cardiovascular risk.⁵ Angiography is the gold standard for vascular imaging in PAD. It is primarily indicated for anatomical evaluation of the

Author: e-mail: drbhatsajad31@gmail.com

patient in whom a revascularisation procedure is intended. It is an invasive test and there is a small risk of contrast induced nephrotoxicity, allergic reaction to the contrast medium, thrombosis and embolism. For patients with suspected pedal ischemia the angiography should include an aortogram with selective unilateral run off and a magnified lateral view of foot. It should be noted that decision to perform an aortogram is made on a clinical basis and need for revascularisation.

In contrast to the variability of pulse assessment and the often non specific nature of inflammation obtained via history and other components of the physical examination, the ABI is a reproducible and reasonably accurate, non invasive measurement for the detection of PAD and the determination of disease severity. The diagnostic criteria for PAD based on ABI are interpreted as follows:⁶

- Normal if 0.91 – 1.30
- Mild Obstruction – 0.70 – 0.90
- Moderate obstruction if 0.40 – 0.69
- Severe obstruction if <0.40
- Poorly compressible if > 1.30

II. MATERIALS AND METHODS

The present study was a hospital based cross sectional study conducted in the postgraduate department of cardiology at Sher i Kashmir institute of medical sciences Soura. The present study was carried for a period of one year from 1st october 2014 to 30th September 2015.

a) Study population

All diabetic patients admitted with coronary artery disease who undergo coronary angiography irrespective of their presentation (stable angina, unstable angina, NSTEMI, STEMI) were included in the study.

b) Exclusion criteria

1. Patients with coronary artery disease without diabetes
2. Diabetic patients without coronary artery disease
3. Patients on vasodilators
4. Chronic kidney disease patients

After taking informed consent to participate in the study, Information regarding demographics, co morbidity, past history and family history was collected. Patients were interviewed and clinical profile of patients including risk factors of coronary artery disease like diabetes, hypertension, smoking, dyslipidemia, obesity and family history of coronary artery disease were assessed and recorded in the proforma. Investigations both non- invasive and invasive including coronary and peripheral angiography were done. Systolic blood pressures of both arms at the brachial arteries and both lower limbs at the dorsalis pedis arteries were taken with the help of sphygmomanometer and a hand held doppler probe and recorded in the proforma. The higher of the two systolic pressures recorded at the ankle was divided by the highest of the systolic pressures recorded in the arms to get the ankle brachial index. The results of ABI were compared with peripheral angiography.

The responses obtained on the questionnaires were converted into data over a Microsoft excel sheet. The variables of interest have been shown in term of frequency and percentages. The standard statistical test, Pearson's chi square test has been used to analyze the data. All the results so obtained were discussed at 5% level of significance (p-value<0.05). Also the appropriate statistical charts have been used to represent the results. SPSS V 20 has been used to analyze the data.

III. RESULTS

During the study period of two years after carefully considering inclusion and exclusion criteria, fifty (50) patients were enrolled in the study. Of the patients males were 37(74%) and 13(26%) were females with a male female ratio of 2.85:1. The mean age of the patients was with a range of 55.6+8.2 and mean duration_of diabetes was 6.8+8.4 years. Out of fifty patients in the study, 32%(n=16) were <50 yrs of age, 36%(n=18)were between 50-60 yrs of age, 32%(n=16) were above 60 yrs of age.

Table 1: Age Distribution

Age	Frequency	Percentage
< 50 yrs	16	32.0
50 – 60 yrs	18	36.0
>60 yrs	16	32.0
Total	50	100.0

Out of fifty (50) patients in study group 74% (n = 37) were males and 26% (n=13) were females.

Table 2: Sex Distribution

Gender	Frequency	Percent
Male	37	74
Female	13	26
Total	50	100.0

Among the total of fifty(50) patients in the study group 80% (n=40) had a normal peripheral angiography while 20% (n=10) had an abnormal angiography. Out of the affected patients 4% (n=2) had plaquing and 16% (n=8) had stenosis of the peripheral arteries.

Table 3: Number of patients with PAD on peripheral angiography

PAD	Frequency	Percent
Normal	40	80
Plaqueling	2	4
Stenosis	8	16
Total	50	100.0

Out of 10 patients having PAD 2% (n=1) were <50yrs of age, 4% (n=2) were between 50-60 yrs of age and 14% (n= 7) of the patients were above 60 yrs of age. The results were statistically significant in relation to age of patients (p = 0.014).

Table 3: Relationship between age and peripheral arterial disease

Age	Peripheral angiography		Total	P value
	Positive	Negative		
<50	1	15	16	0.014
50 - 60	2	18	18	
>60	7	9	16	
Total	10	40	50	
	100%	100%	100%	

Out of ten (10) affected patients, 70% (n=7) were males and 30% (n=3) were females. The relation between sex and PAD was not statistically significant (p= 0.707).

Table 4: Showing gender wise frequency of PAD

		Peripheral Angiography		Total	P Value
		Positive	Negative		
Sex	Male	7	30		0.707
		70%	30%		
	Female	3	10		
		30%	25%		
Total		10	40		
		100%	100%		

Among the angiographically proven PAD patients, 10%(n=1) had no obstruction on hand held doppler device, 20%(n=2) had mild obstruction (ABI = 0.70 – 0.90) and 70%(n=7) had moderate obstruction (ABI= 0.04 – 0.069). None of the patients had severe obstruction (ABI=<0.40) on doppler device.

Table 5: ABI in patients with peripheral arterial disease

ABI	NORMAL	1
	MILD	2
	MODERATE	7
Total		10

Among the patients with normal ABI 2% (n=1) had plaquing with no stenosis on peripheral angiography while among patients with mild obstruction, 2%(n=1) had plaquing and 2% (n=1) had arterial stenosis. Among the patients with moderate obstruction all the patients14% (n=7) had arterial stenosis.

Table 6: Comparing peripheral angiography results with ABI

		PERIPHERAL ANGIOGRAPHY			TOTAL
		PLAQUEING	STENOSIS	NORMAL	
ABI	NORMAL	1	0	39	40
	MILD	1	1	1	3
	MODERATE	0	7	0	7
TOTAL		2	8	40	50

In our study 10%(n=1) of patients with PAD were labelled normal by doppler calculated ABI while as in non – PAD group, 2.5 % were labelled as having PAD. The sensitivity, specificity, positive predictive value and

negative predictive value of ABI by hand held doppler apparatus was found to be 90%, 97.5%, 90% and 97.5% respectively.

Table 7: Sensitivity, Specificity, Positive predictive value and Negative predictive value of ABI

ABI VS PERIPHERAL ANGIOGRAPHY				
		Peripheral Angiography		Total
		Plaueing/ stenosis	Normal	
ABI	Obstruction	9 True Positives (a)	1 False positives (b)	10 a + b
	Normal	1 False Negatives (c)	39 True Negatives (d)	40 C + d
Total		10 (a + c)	40 (b + d)	50 (a + b + c+d)

Sensitivity = $a/a + c = 9/9 + 1 = 0.90 = 90\%$
 Specificity = $d/b + d = 39/39 + 1 = 97.5\%$
 Positive predictive value = $a/ a + b = 9/9 + 1 = 0.90 = 90\%$
 Negative predive value = $d/ c + d = 39/ 39 + 1 = 0.975 = 97.5\%$

IV. DISCUSSION

The present study was a hospital based study conducted in the postgraduate department of cardiology, Sher i kashmir institute of medical sciences Soura Srinagar. In this prospective study fifty(50) type 2 diabetes patients admitted with CAD were studied whose mean age was 55.6 ± 8.2 and mean duration of diabetes was 6.8 ± 8.4 . Not much of the research is currently available on the assessment of PAD in diabetic patients with concomitant CAD. Most of the studies in diabetic patients focus on assessment of CAD with or without other neurovascular complications. The study group included diabetic patients with CAD irrespective of their presentation as stable angina, unstable angina, NSTEMI, and STEMI. In the present study the prevalence of angiographically detected PAD was found to be 20%. Excluding four(4) patients with normal coronary angiography the actual prevalence of PAD in patients with concomitant CAD was equal to 21.73%. A K Agarwal et al found the prevalence of PAD to be 26% in their study of 146 patients with CAD⁷.

Among the angiographically proven PAD patients 10%(n=1) had no obstruction, 20% (n=2) had mild obstruction(ABI=0.70 – 0.90) and 70% (n=7) had moderate obstruction(ABI = 0.70 – 0.90) by using hand held doppler devic. None of the patients had severe obstruction (ABI = <0.40) on doppler device. In our study 10% of patients with PAD were labelled normal by Doppler calculated ABI index while as in non PAD group 2.5% were labeled as having PAD. The sensitivity, specificity, positive predictive value and negative predictive value of ABI by hand held Doppler apparatus was found to be 90%, 97.5%, 90% and 97.5% respectively. Heather Spencer Feigelson et al in their

study screened 421 normal subjects and 63 subjects with large vessel PAD. Segmental blood pressure ratios and flow velocities by Doppler ultrasound were used to define cases of large vessel PAD⁸. The sensitivity, specificity, positive predictive value and negative predictive value of each individual diagnostic algorithm were determined. Overall measurements of posterior tibial artery flow showed the highest sensitivity, specificity, positive predictive value and negative predictive value and overall accuracy. It was found that ABI < 0.80 yielded a test with sensitivity of 89%, specificity of 99%, positive predictive value of 90%, negative predictive value of 99%. The results are reasonably comparable to our study.

BIBLIOGRAPHY

1. Harrison's principals of internal medicine, 18th edition: 2012; vol 2, p – 2066 – 2067.
2. Hirsch AT, Haskal ZJ, Herter et al ; American association for vascular surgery ; Trans Atlantic inter society consensus; and vascular disease foundation. Circulation 2006;113:e463 – 654.
3. Nathaniel C; peripheral arterial disease in people with diabetes. American diabetes association. Diabetes care. 2003; 26:3333 – 3341.
4. Tseng CH. Prevalence and risk factors of peripheral arterial obstructive disease in Taiwanese type 2 diabetic patients. Angiology 2003;54(3):331 - 8.
5. Paul AK, Mash B et al. Peripheral Arterial Disease – High prevalence in rural black South Africans. SAMJ 2007;97(4):285 – 288.
6. Strandness DE Jr, Bell JW: Peripheral vascular disease: diagnosis and evaluation using strain guage. Ann Surg 161 (Suppl. 4):vol 60:27-32.

7. AK Agarwal, Manjeet Singh, Vivek Arya et al. Prevalence of peripheral arterial disease in type 2 diabetes mellitus and its correlation with coronary arterial disease and its risk factors. JAPI 2012; VOL 60:27-32.
8. Heather Spencer Feigelson, Michael H Criqui, Arnost Fronck. Screening for peripheral arterial disease: The sensitivity, specificity, and predictive value of non invasive tests in a defined population.



GLOBAL JOURNALS GUIDELINES HANDBOOK 2020

WWW.GLOBALJOURNALS.ORG

MEMBERSHIPS

FELLOWS/ASSOCIATES OF MEDICAL RESEARCH COUNCIL

FMRC/AMRC MEMBERSHIPS

INTRODUCTION



FMRC/AMRC is the most prestigious membership of Global Journals accredited by Open Association of Research Society, U.S.A (OARS). The credentials of Fellow and Associate designations signify that the researcher has gained the knowledge of the fundamental and high-level concepts, and is a subject matter expert, proficient in an expertise course covering the professional code of conduct, and follows recognized standards of practice. The credentials are designated only to the researchers, scientists, and professionals that have been selected by a rigorous process by our Editorial Board and Management Board.

Associates of FMRC/AMRC are scientists and researchers from around the world are working on projects/researches that have huge potentials. Members support Global Journals' mission to advance technology for humanity and the profession.

FMRC

FELLOW OF MEDICAL RESEARCH COUNCIL

FELLOW OF MEDICAL RESEARCH COUNCIL is the most prestigious membership of Global Journals. It is an award and membership granted to individuals that the Open Association of Research Society judges to have made a 'substantial contribution to the improvement of computer science, technology, and electronics engineering.

The primary objective is to recognize the leaders in research and scientific fields of the current era with a global perspective and to create a channel between them and other researchers for better exposure and knowledge sharing. Members are most eminent scientists, engineers, and technologists from all across the world. Fellows are elected for life through a peer review process on the basis of excellence in the respective domain. There is no limit on the number of new nominations made in any year. Each year, the Open Association of Research Society elect up to 12 new Fellow Members.



BENEFIT

TO THE INSTITUTION

GET LETTER OF APPRECIATION

Global Journals sends a letter of appreciation of author to the Dean or CEO of the University or Company of which author is a part, signed by editor in chief or chief author.



EXCLUSIVE NETWORK

GET ACCESS TO A CLOSED NETWORK

A FMRC member gets access to a closed network of Tier 1 researchers and scientists with direct communication channel through our website. Fellows can reach out to other members or researchers directly. They should also be open to reaching out by other.

Career

Credibility

Exclusive

Reputation



CERTIFICATE

CERTIFICATE, LOR AND LASER-MOMENTO

Fellows receive a printed copy of a certificate signed by our Chief Author that may be used for academic purposes and a personal recommendation letter to the dean of member's university.

Career

Credibility

Exclusive

Reputation



DESIGNATION

GET HONORED TITLE OF MEMBERSHIP

Fellows can use the honored title of membership. The "FMRC" is an honored title which is accorded to a person's name viz. Dr. John E. Hall, Ph.D., FMRC or William Walldroff, M.S., FMRC.

Career

Credibility

Exclusive

Reputation

RECOGNITION ON THE PLATFORM

BETTER VISIBILITY AND CITATION

All the Fellow members of FMRC get a badge of "Leading Member of Global Journals" on the Research Community that distinguishes them from others. Additionally, the profile is also partially maintained by our team for better visibility and citation. All fellows get a dedicated page on the website with their biography.

Career

Credibility

Reputation

FUTURE WORK

GET DISCOUNTS ON THE FUTURE PUBLICATIONS

Fellows receive discounts on the future publications with Global Journals up to 60%. Through our recommendation programs, members also receive discounts on publications made with OARS affiliated organizations.

Career

Financial



GJ INTERNAL ACCOUNT

UNLIMITED FORWARD OF EMAILS

Fellows get secure and fast GJ work emails with unlimited storage of emails that they may use them as their primary email. For example, john [AT] globaljournals [DOT] org.

Career

Credibility

Reputation



PREMIUM TOOLS

ACCESS TO ALL THE PREMIUM TOOLS

To take future researches to the zenith, fellows receive access to all the premium tools that Global Journals have to offer along with the partnership with some of the best marketing leading tools out there.

Financial

CONFERENCES & EVENTS

ORGANIZE SEMINAR/CONFERENCE

Fellows are authorized to organize symposium/seminar/conference on behalf of Global Journal Incorporation (USA). They can also participate in the same organized by another institution as representative of Global Journal. In both the cases, it is mandatory for him to discuss with us and obtain our consent. Additionally, they get free research conferences (and others) alerts.

Career

Credibility

Financial

EARLY INVITATIONS

EARLY INVITATIONS TO ALL THE SYMPOSIUMS, SEMINARS, CONFERENCES

All fellows receive the early invitations to all the symposiums, seminars, conferences and webinars hosted by Global Journals in their subject.

Exclusive





PUBLISHING ARTICLES & BOOKS

EARN 60% OF SALES PROCEEDS

Fellows can publish articles (limited) without any fees. Also, they can earn up to 70% of sales proceeds from the sale of reference/review books/literature/publishing of research paper. The FMRC member can decide its price and we can help in making the right decision.

Exclusive

Financial

REVIEWERS

GET A REMUNERATION OF 15% OF AUTHOR FEES

Fellow members are eligible to join as a paid peer reviewer at Global Journals Incorporation (USA) and can get a remuneration of 15% of author fees, taken from the author of a respective paper.

Financial

ACCESS TO EDITORIAL BOARD

BECOME A MEMBER OF THE EDITORIAL BOARD

Fellows and Associates may join as a member of the Editorial Board of Global Journals Incorporation (USA) after successful completion of three years as Fellow and as Peer Reviewer.

Career

Credibility

Exclusive

Reputation

AND MUCH MORE

GET ACCESS TO SCIENTIFIC MUSEUMS AND OBSERVATORIES ACROSS THE GLOBE

All members get access to 5 selected scientific museums and observatories across the globe. All researches published with Global Journals will be kept under deep archival facilities across regions for future protections and disaster recovery. They get 10 GB free secure cloud access for storing research files.

ASSOCIATE OF MEDICAL RESEARCH COUNCIL

ASSOCIATE OF MEDICAL RESEARCH COUNCIL is the membership of Global Journals awarded to individuals that the Open Association of Research Society judges to have made a 'substantial contribution to the improvement of computer science, technology, and electronics engineering.

The primary objective is to recognize the leaders in research and scientific fields of the current era with a global perspective and to create a channel between them and other researchers for better exposure and knowledge sharing. Members are most eminent scientists, engineers, and technologists from all across the world. Associate membership can later be promoted to Fellow Membership. Associates are elected for life through a peer review process on the basis of excellence in the respective domain. There is no limit on the number of new nominations made in any year. Each year, the Open Association of Research Society elect up to 12 new Associate Members.



BENEFIT

TO THE INSTITUTION

GET LETTER OF APPRECIATION

Global Journals sends a letter of appreciation of author to the Dean or CEO of the University or Company of which author is a part, signed by editor in chief or chief author.



EXCLUSIVE NETWORK

GET ACCESS TO A CLOSED NETWORK

A AMRC member gets access to a closed network of Tier 2 researchers and scientists with direct communication channel through our website. Associates can reach out to other members or researchers directly. They should also be open to reaching out by other.

Career

Credibility

Exclusive

Reputation



CERTIFICATE

CERTIFICATE, LOR AND LASER-MOMENTO

Associates receive a printed copy of a certificate signed by our Chief Author that may be used for academic purposes and a personal recommendation letter to the dean of member's university.

Career

Credibility

Exclusive

Reputation



DESIGNATION

GET HONORED TITLE OF MEMBERSHIP

Associates can use the honored title of membership. The "AMRC" is an honored title which is accorded to a person's name viz. Dr. John E. Hall, Ph.D., AMRC or William Walldroff, M.S., AMRC.

Career

Credibility

Exclusive

Reputation

RECOGNITION ON THE PLATFORM

BETTER VISIBILITY AND CITATION

All the Associate members of AMRC get a badge of "Leading Member of Global Journals" on the Research Community that distinguishes them from others. Additionally, the profile is also partially maintained by our team for better visibility and citation.

Career

Credibility

Reputation

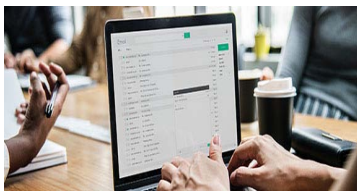
FUTURE WORK

GET DISCOUNTS ON THE FUTURE PUBLICATIONS

Associates receive discounts on future publications with Global Journals up to 30%. Through our recommendation programs, members also receive discounts on publications made with OARS affiliated organizations.

Career

Financial



GJ ACCOUNT

UNLIMITED FORWARD OF EMAILS

Associates get secure and fast GJ work emails with 5GB forward of emails that they may use them as their primary email. For example, john [AT] globaljournals [DOT] org.

Career

Credibility

Reputation



PREMIUM TOOLS

ACCESS TO ALL THE PREMIUM TOOLS

To take future researches to the zenith, fellows receive access to almost all the premium tools that Global Journals have to offer along with the partnership with some of the best marketing leading tools out there.

Financial

CONFERENCES & EVENTS

ORGANIZE SEMINAR/CONFERENCE

Associates are authorized to organize symposium/seminar/conference on behalf of Global Journal Incorporation (USA). They can also participate in the same organized by another institution as representative of Global Journal. In both the cases, it is mandatory for him to discuss with us and obtain our consent. Additionally, they get free research conferences (and others) alerts.

Career

Credibility

Financial

EARLY INVITATIONS

EARLY INVITATIONS TO ALL THE SYMPOSIUMS, SEMINARS, CONFERENCES

All associates receive the early invitations to all the symposiums, seminars, conferences and webinars hosted by Global Journals in their subject.

Exclusive





PUBLISHING ARTICLES & BOOKS

EARN 60% OF SALES PROCEEDS

Associates can publish articles (limited) without any fees. Also, they can earn up to 30-40% of sales proceeds from the sale of reference/review books/literature/publishing of research paper

Exclusive

Financial

REVIEWERS

GET A REMUNERATION OF 15% OF AUTHOR FEES

Associate members are eligible to join as a paid peer reviewer at Global Journals Incorporation (USA) and can get a remuneration of 15% of author fees, taken from the author of a respective paper.

Financial

AND MUCH MORE

GET ACCESS TO SCIENTIFIC MUSEUMS AND OBSERVATORIES ACROSS THE GLOBE

All members get access to 2 selected scientific museums and observatories across the globe. All researches published with Global Journals will be kept under deep archival facilities across regions for future protections and disaster recovery. They get 5 GB free secure cloud access for storing research files.



ASSOCIATE	FELLOW	RESEARCH GROUP	BASIC
<p>\$4800 lifetime designation</p> <hr/> <p>Certificate, LoR and Momento 2 discounted publishing/year Gradation of Research 10 research contacts/day 1 GB Cloud Storage GJ Community Access</p>	<p>\$6800 lifetime designation</p> <hr/> <p>Certificate, LoR and Momento Unlimited discounted publishing/year Gradation of Research Unlimited research contacts/day 5 GB Cloud Storage Online Presense Assistance GJ Community Access</p>	<p>\$12500.00 organizational</p> <hr/> <p>Certificates, LoRs and Momentos Unlimited free publishing/year Gradation of Research Unlimited research contacts/day Unlimited Cloud Storage Online Presense Assistance GJ Community Access</p>	<p>APC per article</p> <hr/> <p>GJ Community Access</p>



PREFERRED AUTHOR GUIDELINES

We accept the manuscript submissions in any standard (generic) format.

We typeset manuscripts using advanced typesetting tools like Adobe In Design, CorelDraw, TeXnicCenter, and TeXStudio. We usually recommend authors submit their research using any standard format they are comfortable with, and let Global Journals do the rest.

Alternatively, you can download our basic template from <https://globaljournals.org/Template>

Authors should submit their complete paper/article, including text illustrations, graphics, conclusions, artwork, and tables. Authors who are not able to submit manuscript using the form above can email the manuscript department at submit@globaljournals.org or get in touch with chiefeditor@globaljournals.org if they wish to send the abstract before submission.

BEFORE AND DURING SUBMISSION

Authors must ensure the information provided during the submission of a paper is authentic. Please go through the following checklist before submitting:

1. Authors must go through the complete author guideline and understand and *agree to Global Journals' ethics and code of conduct*, along with author responsibilities.
2. Authors must accept the privacy policy, terms, and conditions of Global Journals.
3. Ensure corresponding author's email address and postal address are accurate and reachable.
4. Manuscript to be submitted must include keywords, an abstract, a paper title, co-author(s') names and details (email address, name, phone number, and institution), figures and illustrations in vector format including appropriate captions, tables, including titles and footnotes, a conclusion, results, acknowledgments and references.
5. Authors should submit paper in a ZIP archive if any supplementary files are required along with the paper.
6. Proper permissions must be acquired for the use of any copyrighted material.
7. Manuscript submitted *must not have been submitted or published elsewhere* and all authors must be aware of the submission.

Declaration of Conflicts of Interest

It is required for authors to declare all financial, institutional, and personal relationships with other individuals and organizations that could influence (bias) their research.

POLICY ON PLAGIARISM

Plagiarism is not acceptable in Global Journals submissions at all.

Plagiarized content will not be considered for publication. We reserve the right to inform authors' institutions about plagiarism detected either before or after publication. If plagiarism is identified, we will follow COPE guidelines:

Authors are solely responsible for all the plagiarism that is found. The author must not fabricate, falsify or plagiarize existing research data. The following, if copied, will be considered plagiarism:

- Words (language)
- Ideas
- Findings
- Writings
- Diagrams
- Graphs
- Illustrations
- Lectures



- Printed material
- Graphic representations
- Computer programs
- Electronic material
- Any other original work

AUTHORSHIP POLICIES

Global Journals follows the definition of authorship set up by the Open Association of Research Society, USA. According to its guidelines, authorship criteria must be based on:

1. Substantial contributions to the conception and acquisition of data, analysis, and interpretation of findings.
2. Drafting the paper and revising it critically regarding important academic content.
3. Final approval of the version of the paper to be published.

Changes in Authorship

The corresponding author should mention the name and complete details of all co-authors during submission and in manuscript. We support addition, rearrangement, manipulation, and deletions in authors list till the early view publication of the journal. We expect that corresponding author will notify all co-authors of submission. We follow COPE guidelines for changes in authorship.

Copyright

During submission of the manuscript, the author is confirming an exclusive license agreement with Global Journals which gives Global Journals the authority to reproduce, reuse, and republish authors' research. We also believe in flexible copyright terms where copyright may remain with authors/employers/institutions as well. Contact your editor after acceptance to choose your copyright policy. You may follow this form for copyright transfers.

Appealing Decisions

Unless specified in the notification, the Editorial Board's decision on publication of the paper is final and cannot be appealed before making the major change in the manuscript.

Acknowledgments

Contributors to the research other than authors credited should be mentioned in Acknowledgments. The source of funding for the research can be included. Suppliers of resources may be mentioned along with their addresses.

Declaration of funding sources

Global Journals is in partnership with various universities, laboratories, and other institutions worldwide in the research domain. Authors are requested to disclose their source of funding during every stage of their research, such as making analysis, performing laboratory operations, computing data, and using institutional resources, from writing an article to its submission. This will also help authors to get reimbursements by requesting an open access publication letter from Global Journals and submitting to the respective funding source.

PREPARING YOUR MANUSCRIPT

Authors can submit papers and articles in an acceptable file format: MS Word (doc, docx), LaTeX (.tex, .zip or .rar including all of your files), Adobe PDF (.pdf), rich text format (.rtf), simple text document (.txt), Open Document Text (.odt), and Apple Pages (.pages). Our professional layout editors will format the entire paper according to our official guidelines. This is one of the highlights of publishing with Global Journals—authors should not be concerned about the formatting of their paper. Global Journals accepts articles and manuscripts in every major language, be it Spanish, Chinese, Japanese, Portuguese, Russian, French, German, Dutch, Italian, Greek, or any other national language, but the title, subtitle, and abstract should be in English. This will facilitate indexing and the pre-peer review process.

The following is the official style and template developed for publication of a research paper. Authors are not required to follow this style during the submission of the paper. It is just for reference purposes.



Manuscript Style Instruction (Optional)

- Microsoft Word Document Setting Instructions.
- Font type of all text should be Swis721 Lt BT.
- Page size: 8.27" x 11", left margin: 0.65, right margin: 0.65, bottom margin: 0.75.
- Paper title should be in one column of font size 24.
- Author name in font size of 11 in one column.
- Abstract: font size 9 with the word "Abstract" in bold italics.
- Main text: font size 10 with two justified columns.
- Two columns with equal column width of 3.38 and spacing of 0.2.
- First character must be three lines drop-capped.
- The paragraph before spacing of 1 pt and after of 0 pt.
- Line spacing of 1 pt.
- Large images must be in one column.
- The names of first main headings (Heading 1) must be in Roman font, capital letters, and font size of 10.
- The names of second main headings (Heading 2) must not include numbers and must be in italics with a font size of 10.

Structure and Format of Manuscript

The recommended size of an original research paper is under 15,000 words and review papers under 7,000 words. Research articles should be less than 10,000 words. Research papers are usually longer than review papers. Review papers are reports of significant research (typically less than 7,000 words, including tables, figures, and references)

A research paper must include:

- a) A title which should be relevant to the theme of the paper.
- b) A summary, known as an abstract (less than 150 words), containing the major results and conclusions.
- c) Up to 10 keywords that precisely identify the paper's subject, purpose, and focus.
- d) An introduction, giving fundamental background objectives.
- e) Resources and techniques with sufficient complete experimental details (wherever possible by reference) to permit repetition, sources of information must be given, and numerical methods must be specified by reference.
- f) Results which should be presented concisely by well-designed tables and figures.
- g) Suitable statistical data should also be given.
- h) All data must have been gathered with attention to numerical detail in the planning stage.

Design has been recognized to be essential to experiments for a considerable time, and the editor has decided that any paper that appears not to have adequate numerical treatments of the data will be returned unrefereed.

- i) Discussion should cover implications and consequences and not just recapitulate the results; conclusions should also be summarized.
- j) There should be brief acknowledgments.
- k) There ought to be references in the conventional format. Global Journals recommends APA format.

Authors should carefully consider the preparation of papers to ensure that they communicate effectively. Papers are much more likely to be accepted if they are carefully designed and laid out, contain few or no errors, are summarizing, and follow instructions. They will also be published with much fewer delays than those that require much technical and editorial correction.

The Editorial Board reserves the right to make literary corrections and suggestions to improve brevity.



FORMAT STRUCTURE

It is necessary that authors take care in submitting a manuscript that is written in simple language and adheres to published guidelines.

All manuscripts submitted to Global Journals should include:

Title

The title page must carry an informative title that reflects the content, a running title (less than 45 characters together with spaces), names of the authors and co-authors, and the place(s) where the work was carried out.

Author details

The full postal address of any related author(s) must be specified.

Abstract

The abstract is the foundation of the research paper. It should be clear and concise and must contain the objective of the paper and inferences drawn. It is advised to not include big mathematical equations or complicated jargon.

Many researchers searching for information online will use search engines such as Google, Yahoo or others. By optimizing your paper for search engines, you will amplify the chance of someone finding it. In turn, this will make it more likely to be viewed and cited in further works. Global Journals has compiled these guidelines to facilitate you to maximize the web-friendliness of the most public part of your paper.

Keywords

A major lynchpin of research work for the writing of research papers is the keyword search, which one will employ to find both library and internet resources. Up to eleven keywords or very brief phrases have to be given to help data retrieval, mining, and indexing.

One must be persistent and creative in using keywords. An effective keyword search requires a strategy: planning of a list of possible keywords and phrases to try.

Choice of the main keywords is the first tool of writing a research paper. Research paper writing is an art. Keyword search should be as strategic as possible.

One should start brainstorming lists of potential keywords before even beginning searching. Think about the most important concepts related to research work. Ask, "What words would a source have to include to be truly valuable in a research paper?" Then consider synonyms for the important words.

It may take the discovery of only one important paper to steer in the right keyword direction because, in most databases, the keywords under which a research paper is abstracted are listed with the paper.

Numerical Methods

Numerical methods used should be transparent and, where appropriate, supported by references.

Abbreviations

Authors must list all the abbreviations used in the paper at the end of the paper or in a separate table before using them.

Formulas and equations

Authors are advised to submit any mathematical equation using either MathJax, KaTeX, or LaTeX, or in a very high-quality image.

Tables, Figures, and Figure Legends

Tables: Tables should be cautiously designed, uncrowned, and include only essential data. Each must have an Arabic number, e.g., Table 4, a self-explanatory caption, and be on a separate sheet. Authors must submit tables in an editable format and not as images. References to these tables (if any) must be mentioned accurately.



Figures

Figures are supposed to be submitted as separate files. Always include a citation in the text for each figure using Arabic numbers, e.g., Fig. 4. Artwork must be submitted online in vector electronic form or by emailing it.

PREPARATION OF ELETRONIC FIGURES FOR PUBLICATION

Although low-quality images are sufficient for review purposes, print publication requires high-quality images to prevent the final product being blurred or fuzzy. Submit (possibly by e-mail) EPS (line art) or TIFF (halftone/ photographs) files only. MS PowerPoint and Word Graphics are unsuitable for printed pictures. Avoid using pixel-oriented software. Scans (TIFF only) should have a resolution of at least 350 dpi (halftone) or 700 to 1100 dpi (line drawings). Please give the data for figures in black and white or submit a Color Work Agreement form. EPS files must be saved with fonts embedded (and with a TIFF preview, if possible).

For scanned images, the scanning resolution at final image size ought to be as follows to ensure good reproduction: line art: >650 dpi; halftones (including gel photographs): >350 dpi; figures containing both halftone and line images: >650 dpi.

Color charges: Authors are advised to pay the full cost for the reproduction of their color artwork. Hence, please note that if there is color artwork in your manuscript when it is accepted for publication, we would require you to complete and return a Color Work Agreement form before your paper can be published. Also, you can email your editor to remove the color fee after acceptance of the paper.

TIPS FOR WRITING A GOOD QUALITY MEDICAL RESEARCH PAPER

1. Choosing the topic: In most cases, the topic is selected by the interests of the author, but it can also be suggested by the guides. You can have several topics, and then judge which you are most comfortable with. This may be done by asking several questions of yourself, like "Will I be able to carry out a search in this area? Will I find all necessary resources to accomplish the search? Will I be able to find all information in this field area?" If the answer to this type of question is "yes," then you ought to choose that topic. In most cases, you may have to conduct surveys and visit several places. Also, you might have to do a lot of work to find all the rises and falls of the various data on that subject. Sometimes, detailed information plays a vital role, instead of short information. Evaluators are human: The first thing to remember is that evaluators are also human beings. They are not only meant for rejecting a paper. They are here to evaluate your paper. So present your best aspect.

2. Think like evaluators: If you are in confusion or getting demotivated because your paper may not be accepted by the evaluators, then think, and try to evaluate your paper like an evaluator. Try to understand what an evaluator wants in your research paper, and you will automatically have your answer. Make blueprints of paper: The outline is the plan or framework that will help you to arrange your thoughts. It will make your paper logical. But remember that all points of your outline must be related to the topic you have chosen.

3. Ask your guides: If you are having any difficulty with your research, then do not hesitate to share your difficulty with your guide (if you have one). They will surely help you out and resolve your doubts. If you can't clarify what exactly you require for your work, then ask your supervisor to help you with an alternative. He or she might also provide you with a list of essential readings.

4. Use of computer is recommended: As you are doing research in the field of medical research then this point is quite obvious. Use right software: Always use good quality software packages. If you are not capable of judging good software, then you can lose the quality of your paper unknowingly. There are various programs available to help you which you can get through the internet.

5. Use the internet for help: An excellent start for your paper is using Google. It is a wondrous search engine, where you can have your doubts resolved. You may also read some answers for the frequent question of how to write your research paper or find a model research paper. You can download books from the internet. If you have all the required books, place importance on reading, selecting, and analyzing the specified information. Then sketch out your research paper. Use big pictures: You may use encyclopedias like Wikipedia to get pictures with the best resolution. At Global Journals, you should strictly follow here.



6. Bookmarks are useful: When you read any book or magazine, you generally use bookmarks, right? It is a good habit which helps to not lose your continuity. You should always use bookmarks while searching on the internet also, which will make your search easier.

7. Revise what you wrote: When you write anything, always read it, summarize it, and then finalize it.

8. Make every effort: Make every effort to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in the introduction—what is the need for a particular research paper. Polish your work with good writing skills and always give an evaluator what he wants. Make backups: When you are going to do any important thing like making a research paper, you should always have backup copies of it either on your computer or on paper. This protects you from losing any portion of your important data.

9. Produce good diagrams of your own: Always try to include good charts or diagrams in your paper to improve quality. Using several unnecessary diagrams will degrade the quality of your paper by creating a hodgepodge. So always try to include diagrams which were made by you to improve the readability of your paper. Use of direct quotes: When you do research relevant to literature, history, or current affairs, then use of quotes becomes essential, but if the study is relevant to science, use of quotes is not preferable.

10. Use proper verb tense: Use proper verb tenses in your paper. Use past tense to present those events that have happened. Use present tense to indicate events that are going on. Use future tense to indicate events that will happen in the future. Use of wrong tenses will confuse the evaluator. Avoid sentences that are incomplete.

11. Pick a good study spot: Always try to pick a spot for your research which is quiet. Not every spot is good for studying.

12. Know what you know: Always try to know what you know by making objectives, otherwise you will be confused and unable to achieve your target.

13. Use good grammar: Always use good grammar and words that will have a positive impact on the evaluator; use of good vocabulary does not mean using tough words which the evaluator has to find in a dictionary. Do not fragment sentences. Eliminate one-word sentences. Do not ever use a big word when a smaller one would suffice.

Verbs have to be in agreement with their subjects. In a research paper, do not start sentences with conjunctions or finish them with prepositions. When writing formally, it is advisable to never split an infinitive because someone will (wrongly) complain. Avoid clichés like a disease. Always shun irritating alliteration. Use language which is simple and straightforward. Put together a neat summary.

14. Arrangement of information: Each section of the main body should start with an opening sentence, and there should be a changeover at the end of the section. Give only valid and powerful arguments for your topic. You may also maintain your arguments with records.

15. Never start at the last minute: Always allow enough time for research work. Leaving everything to the last minute will degrade your paper and spoil your work.

16. Multitasking in research is not good: Doing several things at the same time is a bad habit in the case of research activity. Research is an area where everything has a particular time slot. Divide your research work into parts, and do a particular part in a particular time slot.

17. Never copy others' work: Never copy others' work and give it your name because if the evaluator has seen it anywhere, you will be in trouble. Take proper rest and food: No matter how many hours you spend on your research activity, if you are not taking care of your health, then all your efforts will have been in vain. For quality research, take proper rest and food.

18. Go to seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.

19. Refresh your mind after intervals: Try to give your mind a rest by listening to soft music or sleeping in intervals. This will also improve your memory. Acquire colleagues: Always try to acquire colleagues. No matter how sharp you are, if you acquire colleagues, they can give you ideas which will be helpful to your research.



20. Think technically: Always think technically. If anything happens, search for its reasons, benefits, and demerits. Think and then print: When you go to print your paper, check that tables are not split, headings are not detached from their descriptions, and page sequence is maintained.

21. Adding unnecessary information: Do not add unnecessary information like "I have used MS Excel to draw graphs." Irrelevant and inappropriate material is superfluous. Foreign terminology and phrases are not apropos. One should never take a broad view. Analogy is like feathers on a snake. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Never oversimplify: When adding material to your research paper, never go for oversimplification; this will definitely irritate the evaluator. Be specific. Never use rhythmic redundancies. Contractions shouldn't be used in a research paper. Comparisons are as terrible as clichés. Give up ampersands, abbreviations, and so on. Remove commas that are not necessary. Parenthetical words should be between brackets or commas. Understatement is always the best way to put forward earth-shaking thoughts. Give a detailed literary review.

22. Report concluded results: Use concluded results. From raw data, filter the results, and then conclude your studies based on measurements and observations taken. An appropriate number of decimal places should be used. Parenthetical remarks are prohibited here. Proofread carefully at the final stage. At the end, give an outline to your arguments. Spot perspectives of further study of the subject. Justify your conclusion at the bottom sufficiently, which will probably include examples.

23. Upon conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium through which your research is going to be in print for the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects of your research.

INFORMAL GUIDELINES OF RESEARCH PAPER WRITING

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form which is presented in the guidelines using the template.
- Please note the criteria peer reviewers will use for grading the final paper.

Final points:

One purpose of organizing a research paper is to let people interpret your efforts selectively. The journal requires the following sections, submitted in the order listed, with each section starting on a new page:

The introduction: This will be compiled from reference matter and reflect the design processes or outline of basis that directed you to make a study. As you carry out the process of study, the method and process section will be constructed like that. The results segment will show related statistics in nearly sequential order and direct reviewers to similar intellectual paths throughout the data that you gathered to carry out your study.

The discussion section:

This will provide understanding of the data and projections as to the implications of the results. The use of good quality references throughout the paper will give the effort trustworthiness by representing an alertness to prior workings.

Writing a research paper is not an easy job, no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record-keeping are the only means to make straightforward progression.

General style:

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear: Adhere to recommended page limits.



Mistakes to avoid:

- Insertion of a title at the foot of a page with subsequent text on the next page.
- Separating a table, chart, or figure—confine each to a single page.
- Submitting a manuscript with pages out of sequence.
- In every section of your document, use standard writing style, including articles ("a" and "the").
- Keep paying attention to the topic of the paper.
- Use paragraphs to split each significant point (excluding the abstract).
- Align the primary line of each section.
- Present your points in sound order.
- Use present tense to report well-accepted matters.
- Use past tense to describe specific results.
- Do not use familiar wording; don't address the reviewer directly. Don't use slang or superlatives.
- Avoid use of extra pictures—include only those figures essential to presenting results.

Title page:

Choose a revealing title. It should be short and include the name(s) and address(es) of all authors. It should not have acronyms or abbreviations or exceed two printed lines.

Abstract: This summary should be two hundred words or less. It should clearly and briefly explain the key findings reported in the manuscript and must have precise statistics. It should not have acronyms or abbreviations. It should be logical in itself. Do not cite references at this point.

An abstract is a brief, distinct paragraph summary of finished work or work in development. In a minute or less, a reviewer can be taught the foundation behind the study, common approaches to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Use comprehensive sentences, and do not sacrifice readability for brevity; you can maintain it succinctly by phrasing sentences so that they provide more than a lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study with the subsequent elements in any summary. Try to limit the initial two items to no more than one line each.

Reason for writing the article—theory, overall issue, purpose.

- Fundamental goal.
- To-the-point depiction of the research.
- Consequences, including definite statistics—if the consequences are quantitative in nature, account for this; results of any numerical analysis should be reported. Significant conclusions or questions that emerge from the research.

Approach:

- Single section and succinct.
- An outline of the job done is always written in past tense.
- Concentrate on shortening results—limit background information to a verdict or two.
- Exact spelling, clarity of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else.

Introduction:

The introduction should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable of comprehending and calculating the purpose of your study without having to refer to other works. The basis for the study should be offered. Give the most important references, but avoid making a comprehensive appraisal of the topic. Describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will give no attention to your results. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here.



The following approach can create a valuable beginning:

- Explain the value (significance) of the study.
- Defend the model—why did you employ this particular system or method? What is its compensation? Remark upon its appropriateness from an abstract point of view as well as pointing out sensible reasons for using it.
- Present a justification. State your particular theory(-ies) or aim(s), and describe the logic that led you to choose them.
- Briefly explain the study's tentative purpose and how it meets the declared objectives.

Approach:

Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done. Sort out your thoughts; manufacture one key point for every section. If you make the four points listed above, you will need at least four paragraphs. Present surrounding information only when it is necessary to support a situation. The reviewer does not desire to read everything you know about a topic. Shape the theory specifically—do not take a broad view.

As always, give awareness to spelling, simplicity, and correctness of sentences and phrases.

Procedures (methods and materials):

This part is supposed to be the easiest to carve if you have good skills. A soundly written procedures segment allows a capable scientist to replicate your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order, but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt to give the least amount of information that would permit another capable scientist to replicate your outcome, but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section.

When a technique is used that has been well-described in another section, mention the specific item describing the way, but draw the basic principle while stating the situation. The purpose is to show all particular resources and broad procedures so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step-by-step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

Materials may be reported in part of a section or else they may be recognized along with your measures.

Methods:

- Report the method and not the particulars of each process that engaged the same methodology.
- Describe the method entirely.
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures.
- Simplify—detail how procedures were completed, not how they were performed on a particular day.
- If well-known procedures were used, account for the procedure by name, possibly with a reference, and that's all.

Approach:

It is embarrassing to use vigorous voice when documenting methods without using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result, when writing up the methods, most authors use third person passive voice.

Use standard style in this and every other part of the paper—avoid familiar lists, and use full sentences.

What to keep away from:

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings—save it for the argument.
- Leave out information that is immaterial to a third party.



Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part as entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Use statistics and tables, if suitable, to present consequences most efficiently.

You must clearly differentiate material which would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matters should not be submitted at all except if requested by the instructor.

Content:

- Sum up your conclusions in text and demonstrate them, if suitable, with figures and tables.
- In the manuscript, explain each of your consequences, and point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation of an exacting study.
- Explain results of control experiments and give remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or manuscript.

What to stay away from:

- Do not discuss or infer your outcome, report surrounding information, or try to explain anything.
- Do not include raw data or intermediate calculations in a research manuscript.
- Do not present similar data more than once.
- A manuscript should complement any figures or tables, not duplicate information.
- Never confuse figures with tables—there is a difference.

Approach:

As always, use past tense when you submit your results, and put the whole thing in a reasonable order.

Put figures and tables, appropriately numbered, in order at the end of the report.

If you desire, you may place your figures and tables properly within the text of your results section.

Figures and tables:

If you put figures and tables at the end of some details, make certain that they are visibly distinguished from any attached appendix materials, such as raw facts. Whatever the position, each table must be titled, numbered one after the other, and include a heading. All figures and tables must be divided from the text.

Discussion:

The discussion is expected to be the trickiest segment to write. A lot of papers submitted to the journal are discarded based on problems with the discussion. There is no rule for how long an argument should be.

Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implications of the study. The purpose here is to offer an understanding of your results and support all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of results should be fully described.

Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact, you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved the prospect, and let it drop at that. Make a decision as to whether each premise is supported or discarded or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."



Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work.

- You may propose future guidelines, such as how an experiment might be personalized to accomplish a new idea.
- Give details of all of your remarks as much as possible, focusing on mechanisms.
- Make a decision as to whether the tentative design sufficiently addressed the theory and whether or not it was correctly restricted. Try to present substitute explanations if they are sensible alternatives.
- One piece of research will not counter an overall question, so maintain the large picture in mind. Where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

When you refer to information, differentiate data generated by your own studies from other available information. Present work done by specific persons (including you) in past tense.

Describe generally acknowledged facts and main beliefs in present tense.

THE ADMINISTRATION RULES

Administration Rules to Be Strictly Followed before Submitting Your Research Paper to Global Journals Inc.

Please read the following rules and regulations carefully before submitting your research paper to Global Journals Inc. to avoid rejection.

Segment draft and final research paper: You have to strictly follow the template of a research paper, failing which your paper may get rejected. You are expected to write each part of the paper wholly on your own. The peer reviewers need to identify your own perspective of the concepts in your own terms. Please do not extract straight from any other source, and do not rephrase someone else's analysis. Do not allow anyone else to proofread your manuscript.

Written material: You may discuss this with your guides and key sources. Do not copy anyone else's paper, even if this is only imitation, otherwise it will be rejected on the grounds of plagiarism, which is illegal. Various methods to avoid plagiarism are strictly applied by us to every paper, and, if found guilty, you may be blacklisted, which could affect your career adversely. To guard yourself and others from possible illegal use, please do not permit anyone to use or even read your paper and file.



CRITERION FOR GRADING A RESEARCH PAPER (COMPILATION)
BY GLOBAL JOURNALS

Please note that following table is only a Grading of "Paper Compilation" and not on "Performed/Stated Research" whose grading solely depends on Individual Assigned Peer Reviewer and Editorial Board Member. These can be available only on request and after decision of Paper. This report will be the property of Global Journals.

Topics	Grades		
	A-B	C-D	E-F
<i>Abstract</i>	Clear and concise with appropriate content, Correct format. 200 words or below	Unclear summary and no specific data, Incorrect form Above 200 words	No specific data with ambiguous information Above 250 words
<i>Introduction</i>	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
<i>Methods and Procedures</i>	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
<i>Result</i>	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
<i>Discussion</i>	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
<i>References</i>	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring



INDEX

A

Adjunct · 1
Amputation · 36
Anonymity · 3
Assert · 1

B

Brachial · 36, 37, 38

C

Cataract · 20, 21, 22, 23, 25, 26, 27, 28
Concomitant · 32, 36, 40
Congenital · 31

E

Ethnicity · 31

F

Feasible · 25

M

Manipulation · 11

P

Perforation · 15, 24
Precocity · 21
Probabilistic · 1, 3

S

Sedentary · 1, 7
Succumbing · 36
Symptomatic · 30, 31, 32, 33, 34, 36



save our planet



Global Journal of Medical Research

Visit us on the Web at www.GlobalJournals.org | www.MedicalResearchJournal.org
or email us at helpdesk@globaljournals.org

ISSN 9755896



© Global Journals