Online ISSN: 2249-4618
Print ISSN: 0975-5888

Global Journal

of Medical Research: C

Microbiology & Pathology

Clinico Haematological Lymphoblastic Leukemia

Highlights

Resistance Staphylococcus

Psammomatous Arteriovenous

Discovering Thoughts, Inventing Future

VOLUME 14 ISSUE 3 VERSION 1.0

Global Journal of Medical Research: C
Microbiology and Pathology

Global Journal of Medical Research: C
Microbiology and Pathology
Volume 14 Issue 3 (Ver. 1.0)

Open Association of Research Society

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

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
301st Edgewater Place Suite, 100 Edgewater Dr.-Pl,
Wakefield MASSACHUSETTS, Pin: 01880,
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
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 (Including by Air Parcel Charges):

For Authors:
22 USD (B/W) & 50 USD (Color)
Yearly Subscription (Personal & Institutional):
200 USD (B/W) & 250 USD (Color)

Integrated Editorial Board
(Computer Science, Engineering, Medical, Management, Natural Science, Social Science)

Dr. Bart Lambrecht
Director of Research in Accounting and FinanceProfessor of Finance
Lancaster University Management School
BA (Antwerp); MPhil, MA, PhD (Cambridge)

Dr. Carlos García Pont
Associate Professor of Marketing
IESE Business School, University of Navarra
Doctor of Philosophy (Management), Massachusetts Institute of Technology (MIT)
Master in Business Administration, IESE, University of Navarra
Degree in Industrial Engineering, Universitat Politècnica de Catalunya

Dr. Fotini Labropulu
Mathematics - Luther College
University of ReginaPh.D., M.Sc. in Mathematics
B.A. (Honors) in Mathematics
University of Windso

Dr. Lynn Lim
Reader in Business and Marketing
Roehampton University, London
BCom, PGDip, MBA (Distinction), PhD, FHEA

Dr. Mihaly Mezei
ASSOCIATE PROFESSOR
Department of Structural and Chemical Biology, Mount Sinai School of Medical Center
Ph.D., Etvs Lornd University
Postdoctoral Training,
New York University

Dr. Söhnke M. Bartram
Department of Accounting and FinanceLancaster University Management SchoolPh.D. (WHU Koblenz)
MBA/BBA (University of Saarbrücken)

Dr. Miguel Angel Ariño
Professor of Decision Sciences
IESE Business School
Barcelona, Spain (Universidad de Navarra)
CEIBS (China Europe International Business School).
Beijing, Shanghai and Shenzhen
Ph.D. in Mathematics
University of Barcelona
BA in Mathematics (Licenciatura)
University of Barcelona

Philip G. Moscoso
Technology and Operations Management
IESE Business School, University of Navarra
Ph.D in Industrial Engineering and Management, ETH Zurich
M.Sc. in Chemical Engineering, ETH Zurich

Dr. Sanjay Dixit, M.D.
Director, EP Laboratories, Philadelphia VA Medical Center
Cardiovascular Medicine - Cardiac Arrhythmia
Univ of Penn School of Medicine

Dr. Han-Xiang Deng
MD., Ph.D
Associate Professor and Research
Department Division of Neuromuscular Medicine
Davee Department of Neurology and Clinical NeuroscienceNorthwestern University
Feinberg School of Medicine

Dr. Pina C. Sanelli
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

Dr. Roberto Sanchez
Associate Professor
Department of Structural and Chemical Biology
Mount Sinai School of Medicine
Ph.D., The Rockefeller University

Dr. Wen-Yih Sun
Professor of Earth and Atmospheric SciencesPurdue University Director
National Center for Typhoon and Flooding Research, Taiwan
University Chair Professor
Department of Atmospheric Sciences, National Central University, Chung-Li, TaiwanUniversity Chair Professor
Institute of Environmental Engineering, National Chiao Tung University, Hsin-chu, Taiwan.Ph.D., MS The University of Chicago, Geophysical Sciences
BS National Taiwan University, Atmospheric Sciences
Associate Professor of Radiology

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

Dr. Bassey Benjamin Esu
B.Sc. Marketing; MBA Marketing; Ph.D Marketing
Lecturer, Department of Marketing, University of Calabar
Tourism Consultant, Cross River State Tourism Development Department
Co-ordinator , Sustainable Tourism Initiative, Calabar, Nigeria

Dr. Aziz M. Barbar, Ph.D.
IEEE Senior Member
Chairperson, Department of Computer Science
AUST - American University of Science & Technology
Alfred Naccash Avenue – Ashrafieh

Contents of the Volume

Global Journal of Medical research: C
Microbiology and Pathology
Volume 14 Issue 3 Version 1.0 Year 2014
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-4618 & Print ISSN: 0975-5888

Clinico Haematological Study of Acute Lymphoblasticleukemia

By Dr. Preethi C R
Jjm Medical College Davangere, India

Abstract- *Context:* Acute Lymphoblastic leukemia encom-passes a group of neoplasms composed of immature, precursor B (pre- B) or T (pre-T) lymphocytes referred to as lymphoblast.

Aims:

1. To know the relative incidence of Acute Lymphoblastic leukemia among the patients referred for complete haemogram at the department of pathology, JJMMC, Davangere.
2. To study the clinical manifestations and their correlation with various types of acute Lymphoblastic leukemia.
3. To study the haematological profiles in acute Lymphoblastic leukemia.

Settings and design: The study was a hospital based study conducted at haematology unit, Department of Pathology, JJM Medical college, Davangere.

Methods and material: The present study was done during the period of June 2006 to May 2008 at haematology unit department of Pathology, JJM Medical college, Davangere. Cases from chigateri general hospital, Bapuji hospital and other private hospitals situated in and around Davangere were included for the study.

Keywords: *leukemias, all, hospital-based study.*

GJMR-C Classification : *NLMC Code: QZ 350, WH 250*

Strictly as per the compliance and regulations of:

Clinico Haematological Study of Acute Lymphoblasticleukemia

Dr. Preethi C R

Abstract- Context: Acute Lymphoblastic leukemia encompasses a group of neoplasms composed of immature, precursor B (pre- B) or T (pre-T) lymphocytes referred to as lymphoblast.

Aims:

1. To know the relative incidence of Acute Lymphoblastic leukemia among the patients referred for complete haemogram at the department of pathology, JJMMC, Davangere.
2. To study the clinical manifestations and their correlation with various types of acute Lymphoblastic leukemia.
3. To study the haematological profiles in acute Lymphoblastic leukemia.

Settings and design: The study was a hospital based study conducted at haematology unit, Department of Pathology, JJM Medical college, Davangere.

Methods and material: The present study was done during the period of June 2006 to May 2008 at haematology unit department of Pathology, JJM Medical college, Davangere. Cases from chigateri general hospital, Bapuji hospital and other private hospitals situated in and around Davangere were included for the study. The case selection was based on clinical features and supported by laboratory evidence. Bone marrow aspiration was subsequently carried out after obtaining written consent from the patient or the guardian.

Statistics: The results were expressed in percentage.

Results and conclusion: A total of 1039 patients who were referred to the department of haematology out of which 13 patients were diagnosed as Acute Lymphoblastic Leukemia. The present study is to highlight that light microscopic features of peripheral smear and bone marrow will still remain mainstay in the diagnosis of acute Lymphoblastic leukemias.

Keywords: leukemias, all, hospital-based study.

I. Introduction

Acute lymphoblastic leukemia encompasses a group of neoplasms composed of immature, precursor(B- pre-B) or T (pre-T) lymphocytes re - ferred to as lymphoblast[1].

Although ALL affects all age groups, ALL has its highest incidence in children between ages, 1-5 years with a peak at 3-4 years[2]. In 1976, Bennet JM et al classified ALL into three sub types (L1, L2 and L3). According to

a) the occurance of individual cytological features
b) The degree of heterogeneity in the distribution among the leukemic population of some or all of these features. The features considered are cell size, nuclear chromatin, nuclear shape, nucleoli, amount and basophilia of the cytoplasm[3].

In the year 1985, the first MIC (morphologic, immunologic, cytogenetic cooperative study group) proposed a classification of ALL[4]. The children cancer study group (CCSG) has presented their own class - ification of ALL which borrows from FAB nomen - clature[5]. The latest WHO classification of the acute leukemias differs from the FAB classification in that greater than or equal to 20% blasts are used for the diagnosis of acute leukemias[6].

II. Objectives

1. To know the relative incidence of Acute lymphoblastic leukemia among the patients referred for complete haemogram at the department of pathology, JJMMC, Davangere.
2. To study the clinical manifestations and their correl- ation with various types of acute lymphoblastic leuk- emia.
3. To study the haematological profiles in acute lymph- oblastic leukemia.

III. Materials and Methods

The present study on "Clinico-Haematological study of Acute LymphoblasticLeukemias" was under- taken during the period of June 2006 to may 2008 at haematology unit, Department of Pathology, J J M Medical College, Davangere.

The cases from chigateri hospital, Bapuji hospital and other private hospitals situated in and around Davangere formed the material of the study. Case selection was based on clinical features and supported by laboratory evidences. Bone marrow aspiration was subsequently carried out after obtaining written consent from the patient or the guardian.

Inclusion criteria

- New cases of ALL

Exclusion criteria

- Treated cases of ALL

The following investigations were done:

1. Complete haemogram was performed and peripheral smear was stained by Leishman stain for all cases and examined in detail.

Author: Jjm Medical College Davangere.
e-mail: drpreethicr2013@gmail.com

2. Bone marrow aspiration and study was done in all cases and leishman stained smears were examined.

In all cases, the following cytochemical stains were employed for diagnosisand subtyping of leukemias.

- MPO – Myelo-peroxidase stain
- SBB – Sudan Black B
- PAS- Periodic Acid Schiff stain
- NSE- Non specific esterase stain

Acute lymphoblasticleukemias were classified based on FAB Criteria.

IV. Results

13 patients in this study were diagnosed as ALL. ALL patients were seen in the age range of 5months to 16 years with a mean age of 8.3 years. The mean ages for males and females were 9.2 years and 6.0 years respectively. Out of the 13 patients, 9 were males and 4 were females, with a male to female ratio of 2.2:1.

The main presenting symptoms were fever in 6 patients (46.1%), generalized weakness in 4 patients (30.8%) and backache in 3 patients (23%).

Physical examination showed pallor of varying degrees in all patients. Lymphadenopathy was present in 8 out of 13 patients constituting (61.5%). All the patients had localized lymphadenopathy among which cervical lymphadenopathy was common.

Mild to moderate Hepatomegaly was seen in 7 patients (53.8%).

Mild to moderate Splenomegaly was seen in 10 patients (76.9%).

Anemia of variable degree was seen an all patients of ALL. The Hb level ranged from 5.9-7.2gm/dl. The mean Hb level being 6.7gm/dl. TLC ranged from 16.9× 10^9/l to 210× 10^9/l. the mean TLC being 75.8× 10^9/l. 5 patients (38.4%) had count between 11-49× 10^9/l, 4 patients (30.7%) had counts between 50-100× 10^9/l, 4 (30.7%) patients had counts >100× 10^9/l.

All the 13 patients had thromobocytopenia at the time of diagnosis, 5 patients had counts from 11-49× 10^9/l, 4 patients had counts from 50-100× 10^9/l, 4 patients had counts >100× 10^9/l, with a mean platelet count of 82.3× 10^9/l.

10 out of 13 patients had an ESR of >50mm at the end of 1st hour and 3 patients between 20-50mm at the end of 1st hour.

Bone marrow aspiration was performed in all 13 patients. Lymphoblast was the predominant cell with an average of 85% blasts on differential count. All the patients had decreased megakaryocytes. All were subtyped on morphological basis using FAB criteria into 3 subtypes-L1, L2, and L3. The identification of lympho - blasts was mainly on morphological grounds as stated in the FAB proposals. MPO/SBB and PAS stains were performed. Most of the ALL patients were MPO/SBB negative, but characteristic block positivity on PAS was seen in 38.5% of the patients.

Table 1 : Haematological Parameters in FAB Subtypes of ALL

Haematological parameters	ALL (n=13)	L1	L2	L3
Hb (gm/dl) Range Mean	 5.9-7.2 6.7	 - -	 5.9-7.2 6.7	 - -
TLC (×10^9/L)				
Range	16.8-210	-	16.8-210	-
Mean	75.8	-	75.8	-
Platelets (×10^9/L)				
Range	0.46-145	-	0.46-145	-
Mean	82.3	-	82.3	-
Blast range (%)	60-90	-	60-90	-
Bone marrow decreased megakaryocytes	13	-	13	-
Blast mean	85%	-	85%	-

a) Acute Lymphoblastic Leukemia (L1)

No case of L1 was encountered in this study.

b) Acute Lymphoblastic Leukemia (L2)

All the 13 patients who were diagnosed as ALL were ALL-L2 in this study. The age range was 5 months to 16 years with a mean age of 8.3 years. The mean ages for males and females were 9.2 years and 6 years respectively. Out of the 13 patients, 9 were males and 4 were females, with a male to female ratio of 2.2:1.

The main presenting symptoms were fever in 6 patients (46.1%), generalized weakness in 4 patients (30.8%) and backache in 3patient (23%).

Physical examination showed pallor of varying degrees in all patients. Lymphadenopathy was present in 8 of the 13 patients constituting (61.5%). All the 8

patients had localized lymphadenopathy among which cervical lymphadenopathy was common.

Mild to moderate hepatomegaly was seen in 7 patients (53.8%).

Mild to moderate Splenomegaly was seen in 10 patients (76.9%).

Anemia of variable degree was seen an all patients of ALL. The Hb level ranged from 5.9-7.2gm/dl. The mean Hb level being 6.7gm/dl. TLC ranged from 16.9× 10^9/l to 210× 10^9/l. the mean TLC being 75.8× 10^9/l. 5 patients (38.4%) had count between 11-49× 10^9/l, 4 patients (30.7%) had counts between 50-100× 10^9/l, 4 (30.7%) patients had counts >100× 10^9/l.

All the 13 patients had thromobocytopenia at the time of diagnosis, 5 patients had counts from 11-49× 10^9/l, 4 patients had counts from 50-100× 109/l, 4 patients had counts >100× 10^9/l, with a mean platelet count of 82.3× 10^9/l.

10 out of 13 patients had an ESR of >50mm at the end of 1st hour and 3 patients between 20-50mm.

Bone marrow aspiration was done in all 13 patients. Marrow was hypercellular. Aspiration showed reduced erythropoiesis and megakaryopoiesis. Leucopoiesis showed a predominance of lymphoblasts which comprised of heterogenous population of both large and small lymphoblasts. The average blast count was 85%.

Cytochemical staining for MPO/SBB was negative and PAS positivity was seen in 38.5% of the patients.

c) Acute Lymphoblastic Leukemia (L3)

No case of L3 was encountered in this study.

V. Discussion

The mean age incidence in the present study was 8.3%. In studies conducted by Shome et al (1985)7 and Mathur (1993)8 et al, the mean age incidence was 15.6 and 29.7 respectively. This was more when compared to the present study.

The male female ratio in our study was 2.2:1. In studies done by Shome et al (1985) and Mathur (1993) et al, the male to female ratio was 3.4:1 and 2.4:1 respectively. This is more when compared to the present study.

The average figures for age incidences in the present study are less than the figures quoted in other Indian studies.

The main presenting symptoms were fever and generalized weakness in our study. The same was noted by Shome et al (1985) and Mathur (1993) et al. Bleeding manifestation as a presenting symptom was not noted in this study. Higher incidences of bleeding manifestations were noted by Shome et al (55%) and Mathur et al (47%). A high incidence of lymphad - enopathy was seen consistently in this study and also in other studies. Hepatosplenomegaly was also a prese - nting symptom in this study. Similar observation was noted by Shome et al (1985) and Mathur (1993) et al, but with a more frequency among patients. Backache was seen in 23% of the patients in this study. Backache was not seen in study done by Shome et al (1985) and Mathur (1993) et al.

Pallor was present in our study and it correlates well with a study done by Mathur (1993) et al.

Sternal tenderness was present in studies conducted by Shome et al (1985) and Mathur (1993) et al, but was not observed in the present study. CNS manifestations was present in study conducted by Sho - me et al (1985), but it was not observed in the present study.

Table 2 : Comparison of clinical features of ALL (in %)

Clinical features	Shome et al (1985)	Mathur et al (1993)	Present study (2008)
Fever	73	94	46.1
Generalized weakness	80	100	30.8
Bleeding	55	47	-
Pain abdomen	20	18	-
Pallor	87	100	100
Lymphadenopathy	80	88	61.5
Splenomegaly	77	75	76.9
Hepatomegaly	88	75	53.8
Sternal tenderness	39	53	-
Signs of haemorrhage	16	47	-
CNS manifestations	10	-	-
Back ache	-	-	23

Anemia was seen in all the cases of ALL in the present study. Similar finding was observed in study conducted by Mathur et al. Mean Hbpercent was 6.7gm/dl in the present study, and it was more compared to Mathur et al.

The mean TLC in the present study was 75.8×10^9/l. In the study done by Mathur et al, it was

35.8×10^9/l. This count was less when compared to the present study.

Thrombocytopenia was present in all the patients in the present study. The mean platelet count was 82.3×10^9/l in the present study. This was high when compared to the study conducted by Mathur et al, where it was 55.2×10^9/l.

Bone marrow examination was performed in all 13 cases.

The mean blast percentage was 85%. This was more when compared to Mathur et al where it was 57%.

Table 3 : Comparison of haematological parameters of ALL

Haematological parameters	Mathur et al (1993)	Present study (2008)
Hbgm/dl Range Mean	2-9.5 5.2	5.9-7.2 6.7
TLC ($\times10^9$/l) Range Mean	8-90 35.8	16.8-210 75.8
Platelets ($\times10^9$/l) Range Mean	20-150 55.2	0.46-145 82.3
Blasts (%) Range Mean	20-90 57	60-90 85

In the present study, all the patients, that were diagnosed as ALL were ALL-L2 (100%). In the study done by Mahendrakumar (1998)9 L2 was a predominant subtype. Shome et al (1985) reported an almost equal incidence of L1 and L2 (45.8% and 42.4%).

The mean age for L2 was 8.3 years in the present study. Shome et al (1985) reported a mean age of 17.7, whereas Mahendrakumar (1998) reported a mean age 13.6 for L2. In this study, the sex ratio showed a male predominance in L2 subtype (2.2:1). The Shome et al (1985) showed a sex ratio of 2.6:1 in L2 type, whereas the study of Mahendrakumar (1998) showed a sex ratio of 1.8:1 in L2 type.

The general pattern of clinical features varies with the findings of Shome et al (1985). Fever and generalized weakness were a common initial clinical presentation in the present study whereas in study done by Shome et al (1985) a higher percentage of fever and generalized weakness were noted. Lymphadenopathy was common in ALL-L2 in the present study (61.5%) and is less when compared to Shome et al (73%). Splenomegaly correlates well with study by Shome et al (1985). Hepatomegaly was seen in less frequency when compared to Shome et al (1985). Backache was seen in 23% of the patients in this study and was not seen in study conducted by byShome et al (1985).

The mean Hb levels in ALL-L2 subtype correlates with Shome et al study (1985). TLC also correlates with Shome et al series.

Thrombocytopenia was seen in all patients in this study. The mean platelet count was little less when compared to study done by Shome et al (1985).

Table 4 : Comparison of haematological parameters of in FAB subtypes of ALL

Haematological parameters	L1		L2		L3	
	PGI	PS	PGI	PS	PGI	PS
Hbgm/dl) Mean	6.6	-	6.8	6.7	8.4	-
TLC ($\times10^9$/l) Mean	39.10	-	77.6	75.8	29	-
Platelets ($\times10^9$/l) Mean	81	-	85	69.3	49.3	-
Bone marrow decreased megakaryocytes (in %)	96	-	90	100	100	-

In the present study PAS positivity was seen in only 38.5% of patients while study by Shome et al (1985) series reported PAS positivity in 20% of ALL patients. Mahendrakumar (1998) reported PAS positivity in 43.8% of ALL patients. Fayaz khan10 reported PAS positivity in 53.5% of ALL patients.

VI. Conclusion

ALL was diagnosed in 13 patients (20.63%). All the patients that were diagnosed with ALL were ALL-L2.

Lymphadenopathy was the most consistent feature with fever, generalised weakness, backache and

hepatomegaly. Anemia and thrombocytopenia were pre -sent in all the patients. TLC count ranged from 16.9 to 210×10^9 /l with a mean of 75.8×10^9 /. The mean blast percentage was 85%.

The present study is to highlight that light microscopic features of peripheral smear and bone marrow still remain mainstay in the diagnosis of acute leukemias, whereas immunotyping and cytogenetics are complimentary procedures at specialized centres.

However, with newer modalities of therapy and rewarding curative results in haematological malign - ancies, the use of cytochemistry, immunotyping and cytogenetics have become gold standards for arriving at a specific diagnosis.

References Références Referencias

1. Abdul abbas, Nelson fausto: chapter 14: Diseases of white blood cells, lymph nodes, spleen and thymus: Robbins and cotran's Pathologic basis of disease: seventh edition: Elsevier, Saunders comp - any: page no 661-709.
2. Whitlock A James and Gaynon S Paul: Acute lymphoblastic leukemia in children: Chapter 80 in Wintrobe's clinical haematology: 11thed: Lippincot Williams and Wilkins company: 2004: Vol 2:2143-2169pp.
3. Bennet JM et al: Proposals for classification of the acute leukemias: Br J Haematol: 1976:33: 451-458pp.
4. Bennet JM et al: Morphologic, immunologic and cytogenetic (MIC) working classification of the acute myeloid leukemias second MIC co-operative study group: Br J Haematol: 1988:68: 487-494pp.
5. Behm G Frederick: Morphologic and cytochemical characteristics of childhood lymphoblastic leukemia: HaematolOncolClin North Am: 1990: 4: 715-774pp.
6. Schumacher, Harold et al: Acute leukemia, Clinlabmed: 2002: 22: 153-192pp.
7. Shome DK et al: The leukemias at presentation: Clinical, Demographic and cytologic variables: Ind J Cancer: 1985: sept 194-209pp.
8. Mathur SK et al: Clinical profile of acute leukemias: A study of 50 cases: Indian Practitioner: 1993: 46: 171-174pp.
9. Mahendra Kumar H: Clinico-haematological study of leukemias(unpublished doctoral dissertation, Kuvempu University, Shimoga, 1998): 150pp.
10. Khan FayazMukarab: Clinico-haematological study of childhood acute leukemia (unpublished doctoral dissertation, Rajiv Gandhi University of Health Sciences, Karnataka, 2003): 146pp.

This page is intentionally left blank

Global Journal of Medical research: C
Microbiology and Pathology
Volume 14 Issue 3 Version 1.0 Year 2014
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-4618 & Print ISSN: 0975-5888

Psammomatous Arteriovenous Malformation-Brain: A Rare Histological Presentation Leading to Diagnostic Dilemma

By Sanjay Piplani, Rahul Mannan, Manas Madan, Harjot Kaur, Saumil Garg & Monika Lalit

Baba Farid University, India

Abstract- Occurrence of psammoma bodies (PB) in CNS is strongly associated with meningiomas. Its occurrence with arterio-venous malformation (AVM) is rare. We report a case of an unconscious 70 year old male who presented in the emergency department with mass lesion and on histopathology revealed a lesion composed of variable sized dilated and congested vascular channels which were mainly thin walled but with few thick walled vascular channels as well. Also noted were numerous lamellated calcified bodies (PB) which were present both intra-vascularly in small vascular channels as well as extra-vascular glial tissue. The minimal glial tissue included in the biopsy showed astrocytic proliferation showing mild anisonucleosis and hyperchromasia. Hence on light microscopy a differential diagnosis of Psammomatous cavernous haemangioma with a possibility of concurrent meningioma was suggested, as the synchronous presence of both the lesions is well documented in literature. A possibility of angiomatous variant of meningioma was also suggested.

Keywords: av malformation, cns, psamomma bodies.

GJMR-C Classification : NLMC Code: WL 300

Strictly as per the compliance and regulations of:

Psammomatous Arteriovenous Malformation-Brain: A Rare Histological Presentation Leading to Diagnostic Dilemma

Sanjay Piplani [α], Rahul Mannan [σ], ManasMadan [ρ], HarjotKaur [ω], SaumilGarg [¥] & Monika Lalit [§]

Abstract- Occurrence of psammoma bodies (PB) in CNS is strongly associated with meningiomas. Its occurrence with arterio-venous malformation (AVM) is rare. We report a case of an unconscious 70 year old male who presented in the emergency department with mass lesion and on histop - athology revealed a lesion composed of variable sized dilated and congested vascular channels which were mainly thin walled but with few thick walled vascular channels as well. Also noted were numerous lamellated calcified bodies (PB) which were present both intra-vascularly in small vascular channels as well as extra-vascular glial tissue. The minimal glial tissue included in the biopsy showed astrocytic prolife - ration showing mild anisonucleosis and hyperchromasia. Hence on light microscopy a differential diagnosis of Psammomatous cavernous haemangioma with a possibility of concurrent meningioma was suggested, as the synchronous presence of both the lesions is well documented in literature. A possibility of angiomatous variant of meningioma was also suggested. For confirmation of diagnosis, immunohi - stochemical studies were recommended which confirmed the lesion to be arising from vascular endothelial cells; so thereby conclusively ruling out meningotheliomatous neoplasm. Hence a final diagnosis of psammomatousarteriovenous malfor - mation was rendered.

Present case report is worth publishing as it not only documents the presence of PB in setting of AVM, but also highlights the importance of utilizing IHC tool to conclusively diagnose or rule out meningiomas in all such settings. It is important because angiomatous variant of meningioma with presence of PB can closely mimic AVM leading to a wrong diagnosis and further wrong management of the patient.

Keywords: av malformation, cns, psamomma bodies.

I. Introduction

Psammoma body (from Greek word psammos meaning “sand”) is a lamellated round collection of calcium. It is an example of dystrophic calcification seen mainly in various neoplastic and non neoplastic lesions. [1] Its occurrence in CNS is strongly associated with meningotheliomatous malignancies (meningiomas).

We present an interesting case of CNS lesion in a 70 year old male presenting with increased psamm – omatous calcification in angiomatous malformation (AVM) leading to a diagnostic dilemma.

II. Case Report

A 70 year old male presented in the emergency department of a tertiary care teaching hospital post trauma head after a road side accident. On admission, patient was unconscious. His Glasgow coma scale was 9. Patient was taken up for routine haematological, biochemical and serological investigations which were within normal limits. On ophthalmological examination, evidence of increased intracranial tension was suggested and patient was taken to the radiodiagnosis department for CT Head. Radiological opinion revealed a hyperdense lesion of size 7.2x3.4x5.7cm associated with hemorrhage seen in the region of right temporal lobe, right basal ganglia and corona radiate. Effacement of sylvian tissue with compression of right lateral ventricle and midline shift of 6 mm towards left side was noted.[Figure-1] To relieve the intracranial tension and to reach a conclusive diagnosis regarding the nature and etiology of mass lesion, craniotomy was done. The blood clots along with tissue fragments were evacuated and the specimen thus collected was sent to the pathology department for histopathological examination (HPE). The tissue was processed; 3-4 micron thick sections were cut and stained with haematoxylin and eosin stain. The sections processed showed variable sized dilated and congested vascular channels which were mainly thin walled but with few thick walled vascular channels as well. Also noted were numerous lamellated calcified bodies (psammoma bodies) which were present both intra-vascularly in small vascular channels as well as extra-vascular glial tissue. [Figure-2 and 3]

Author α σ ρ ω ¥ §: Sgrdimsr, Amritsar, Punjab (India).
e-mails:sanjaymikki@gmail.com, rahulmannan@gmail.com
manasmadan@gmail.com, harjotbhandari@gmail.com
monika.lalit@yahoo.com

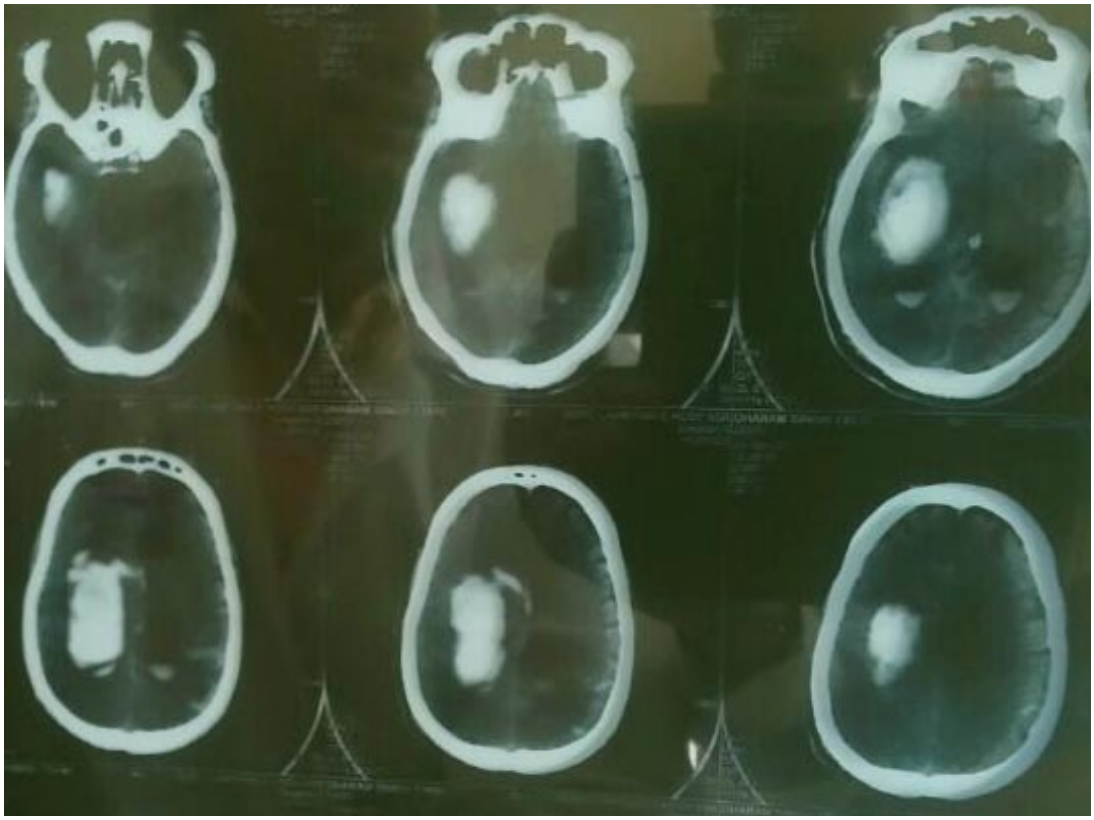


Figure 1 : Mass lesion seen in temporal lobe on CT scan plate

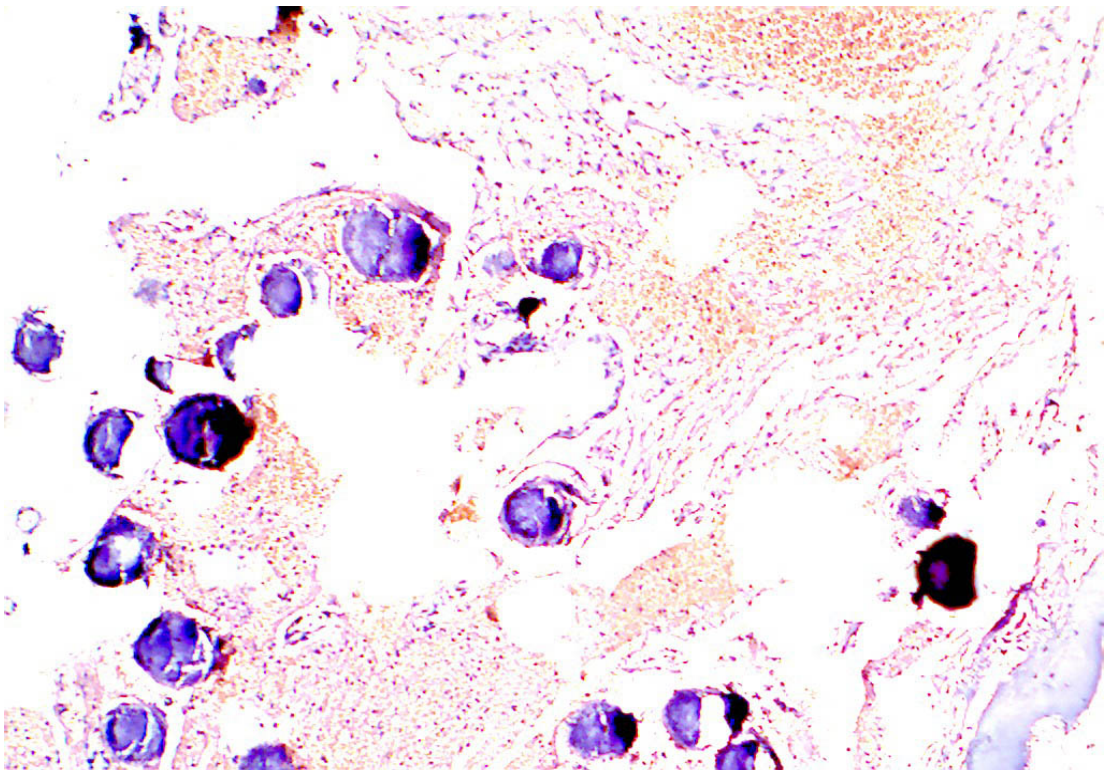


Figure 2 : Multiple lamaelated calcified psammoma bodies lying amidst hemorrhagic glial tissue. The glial tissue itself is exhibiting mild anisonucleosis. [H & E 200 X]

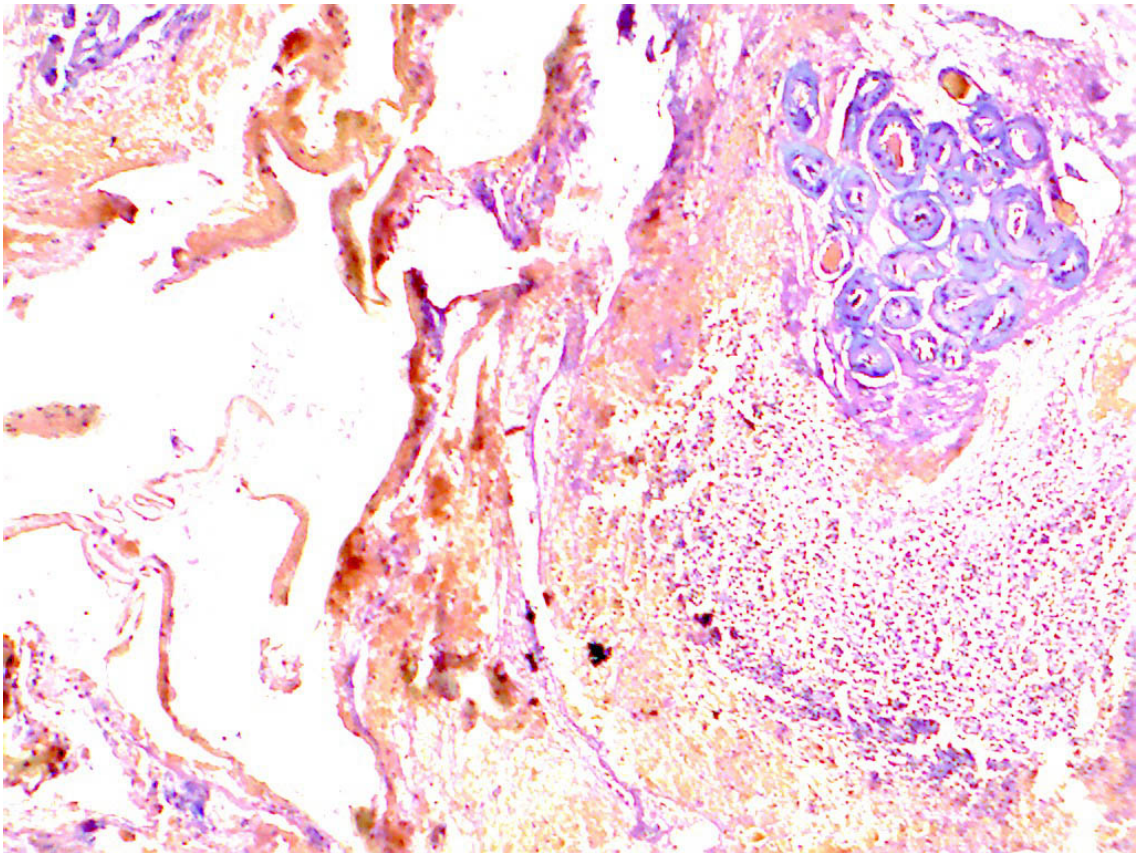


Figure 3 : Areas of haemorrhage and presence of both thin walled dilated vascular channels as well as few thick walled muscular channels. [H & E 200 X]

The minimal glial tissue included in the biopsy showed astrocytic proliferation showing mild anisonu - cleosis and hyperchromasia. Slightly angulated nuclei were also noted. However; no obvious paranuclear vacu -oles or grooving was noted. Hence on light microscopy a differential diagnosis of Psammomatous cavernous haemangioma with a possibility of concurrent menin - gioma was suggested, as the synchronous presence of both the lesions is well documented in literature. A possibility of angiomatous variant of meningioma was also suggested.

For confirmation of diagnosis, immunoh - istochemical studies(IHC studies) were recommended which demonstrated immunoreactivity with CD31 and CD34 and immuno-negativity for EMA and CK-18. IHC therefore confirmed the lesion to be arising from vas - cular endothelial cells; so thereby conclusively ruling out meningotheliomatous neoplasm. The exuberant cha - nges noted in the glial tissue were attributed to the phenomenon of reactive gliosis arising in setting of haemorrhagic diathesis of a vascular neoplasm post trauma. Hence a final diagnosis of psammomat - ousarteriovenous malformation was rendered.

III. Discussion

Psammoma bodies (PB) arelamillated baso - philic structures which stain for mucin, calcium and iron. Osteopontin produced by the macrophages is closely linked to their pathogenesis in the setting of dystrophic calcification.[2]

Although conventionally presence of PB is harbinger of malignancy; for example, its presence in locations such as thyroid or cervical lymph node, almost always points towards a diagnosis of papillary carcin - oma thyroid. Its presence is documented in various - tumours such as papillary renal cell carcinoma, papillary serous cyst-adenocarcinoma, endometrial adenoc - arcinoma, mesotheliomas, somatostatinomas of pancr - eas and prolactinomas in pituitary gland. In central nervous system (CNS), its presence in mass lesions is often a red-herring for neuro-pathologist towards a diagnosis of meningioma as seen in present case rep - ort.

PB can however also be seen in certain non-neoplastic lesions such as endosalpingiosis of female genital tract[3], psammomatousmelanoticschwanoma and even melanocytic naevi.

Apart from meningiomas, in CNS; PB are associated with a rare benign vascular malformation ari - sing in capillary telangiectasis-"Calcified telangiect -

atichamartoma" or "hemangiomacalcificans."[4] Its asso -ciation with (AVM) is rare as noted in present case report. The situation is confounded further by the fact that AVM have been found in association with a variety of intracranial neoplasms. The simultaneous occurrence is thought to be coincidental but at many times it may also reflect common origin.[5]

Various hypothesis regarding synchronocity have been postulated such as AVM induce tumour development and vise-a-versa. Also it has been prop -osed that certain humoral factors secreted by tumours can induce AVM as an acquired condition and that any focus of chronic irritationarising out of haemo -rrhagic diathesis on the arachnoid cells could cause a meningioma to develop.[6, 7]

Although CT report did point towards a diagnosis of AVM, the presence of atypical looking meningothelial cells (later attributed to reactive gliosis) did create a diagnostic dilemma in setting of large number of PB on biopsy.

It was important to rule out a possibility of meningioma as the management is different in the setting of intracranial AVM associated with meningioma. IHC is a useful tool in such cases. Meningiomas exhibit (at least focally) membranous as well as diffuse cytoplasmic immunolabelling for EMA, a feature foreign to vascular neoplasms of CNS such as hemangio -pericytoma, nerve sheath tumours, solitary fibrous tumour and other fibroblastic tumours. Also on immune -labelling for cytokeratins, it is typically positive for CK-18 and negative for CK-20.[8] Both these markers were negative in the present case thereby comprehensively ruling out any possibility of meningioma. Also all the endothelial markers were positive on IHC. The optimal therapy for AVM has many options such as surgery, neuro-surgical treatment with radiosurgery or embolization or a combination of surgical and non surgical methods.

Present case report is worth publishing as it not only documents the presence of PB in setting of AVM, but also highlights the importance of utilizing IHC tool to conclusively diagnose or rule out meningiomas in all such settings. It is important because angiomatous variant of meningioma with presence of PB can closely mimic AVM leading to a wrong diagnosis and further wrong management of the patient.

References Références Referencias

1. Johannessen JV, Sobrinho-Simoes M. The origin and significance of thyroid psammoma bodies. Lab Invest. 1980;43(3):287-96.
2. Tunio GM, Hirota S, Nomura S, Kitamura Y. possible relation of osteopontin to development of psammoma bodies in human papillary thyroid cancer. Arch Pathol Lab Med 1998, 122: 1087-90.
3. Hallman KB, Nahhas WA, Connelly PJ. Endosal -pingosis as a source of psammoma bodies in a papanicolau smear. A case report. J Reprod Med. 199; 36(9):675-8.
4. Ghosh P, Saha K. Hemangiomacalcificans: a rare entity with epileptiogenic potential. South Asian J Cancer 2013; 2(4):231.
5. Çayli SR, Sokmen O, Bulut T. Intracranial arterio -venous malformation associated with meningioma: An Unusual case. Turkish Neurosurgery. 2001; 11: 126-9.
6. Folkman J: Tumor angiogenesis. Adv Cancer Res. 1974; 19: 331-58.
7. Fukawa J, Tanata T, Takekawa: The association of intracranial meningioma with arteriovenous malfo -rmation and aneurysm. Report of a case. No ShinkeiGeka 1997; 5: 175-80.
8. Juan Rosai. Ackerman's and Rosai's Surgical Pathology; 9thedn; Vol II. Missouri: C.V. Mosby and Co.

Global Journal of Medical research: C
Microbiology and Pathology
Volume 14 Issue 3 Version 1.0 Year 2014
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-4618 & Print ISSN: 0975-5888

Benign Tumors of Skin

By Dr. Shivaprasad. P.N., Dr. Prabhu. M.H., Dr. Siraj Ahmed S. & Dr. Aftab Begum

Rajiv Gandhi University of Health Sciences, India

Introduction- The skin is a complex and the largest organ in the body. Wide range of diseases can develop from the skin including tumors from surface epidermis. The vast diversity of these lesions and descriptive data, often overlapping produces confusion in the area of nomenclature and difficulty in diagnosis.1 Histopathological study is valuable means of diagnosis in dermatology. But it has limitations; som - etimes, in case of tumors definitive diagnosis cannot be made.2 The distinction between benign and malignant neoplasm are rather more difficult to define when they appear in skin than when found elsewhere3 and histopathological examination is frequently required to establish a definitive diagnosis. Diagnosis of any skin tumors can be done by correlating clinical features and histological features, which can be supported by histochemistry, immuno-histochemistry and electron microscopy.

GJMR-C Classification : NLMC Code: QZ 310

Strictly as per the compliance and regulations of:

Benign Tumors of Skin

Dr. Shivaprasad. P.N. [α], Dr. Prabhu. M.H. [σ], Dr. Siraj Ahmed S. [ρ] & Dr. Aftab Begum [ω]

I. Introduction

The skin is a complex and the largest organ in the body. Wide range of diseases can develop from the skin including tumors from surface epidermis. The vast diversity of these lesions and descriptive data, often overlapping produces confusion in the area of nomenclature and difficulty in diagnosis.[1]

Histopathological study is valuable means of diagnosis in dermatology. But it has limitations; som - etimes, in case of tumors definitive diagnosis cannot be made.[2]

The distinction between benign and malignant neoplasm are rather more difficult to define when they appear in skin than when found elsewhere[3] and histopathological examination is frequently required to establish a definitive diagnosis.

Diagnosis of any skin tumors can be done by correlating clinical features and histological features, which can be supported by histochemistry, immuno-histochemistry and electron microscopy.

II. Methodology

This study of "Tumors of the skin" was carried out from November 2005 to April 2007 over a period of 18 months.

Inclusion Criteria: All benign and malignant tumors of skin were included.

Exclusion Criteria: All non-neoplastic lesions and mesenchymal tumors were excluded.

Brief clinical history and findings were noted. Gross features were examined; Incisional or excisional biopsy study was done to assess nature of tumors, and fixed all specimens in 10% formalin for 12-36 hours. Further, tissue was processed and embedded in paraffin blocks. Sections of 6 micron thickness were taken and stained with hematoxylin and eosin and studied. Special stains were used whenever necessary. According to WHO classification of skin tumors (1974)[4] cases were classified into:

1. Epidermal tumors and tumors-like lesions
2. Precancerous lesions

Infective conditions were omitted

Statistical Methods Applied

1. Cross tabs Procedure
2. Chi-square test
3. Descriptive statistics

III. Results

During the period of 18 months from November 2005 to April 2007, out of the total surgical specimens received in Department of Pathology, for histopat - hological study 790 were of tumors and out of these 54 were skin tumors.

Table 1 : Incidence of skin tumors

Total number of tumors	Number of skin tumors	Percentage
790	54	6

Of the 54 cases, 14 were diagnosed as benign tumors and 40 as malignant tumors. The benign tumors constituted 25.92% and malignant tumors constituted 74.07%.

The study also showed there was male predominance and the male to female ratio was 2.7:1.

Author α: Narayana multispeciality hospital, CAH-1, Mysore-9.
Author σ: Navodaya Medical College & Hospital, Raichur.
Author ρ: GIMS, Gadag. India. e-mail: drsms70@gmail.com
Author ω: KAMS, Karwar,Karnataka.

Table 2 : Age incidence of tumors of skin

Age in years	Number of cases	Percentage
0-19	2	4
20-29	2	4
30-39	1	2
40-49	13	23.5
50-59	11	20
60-69	13	23.5
70-79	10	19
80-89	2	4
Total	54	100

$\chi^2 = 30.741$; $p < 0.000$ (Highly Significant)

In the present study the peak age group was between 5th and 7th decade.

Table 3 : Sex incidence of tumors of skin

Sex	Number of cases	Percentage
Male	40	74
Female	14	26
Total	54	100

$\chi^2 = 12.519$; $p < 0.000$ (Highly Significant)

The study showed there was male predominance with the male to female ratio of 2.7:1.

a) Benign tumors of skin

In the present study, benign tumors amounted to 14 (25.92%) out of total 54 skin tumors.

Table 4 : Incidence of benign tumors of skin

Tumor	Number of cases	Percentage
Epidermal		
Seborrheic Keratosis	8	57
Keratoacanthoma	4	29
Warty dyskeratosis	2	14
Total	14	100

b) Benign tumors of epidermis

i. *Seborrheic keratosis*

In the present study, 8 cases (57%) of Seborrheioc keratosis were encountered, out of which one is melanoacanthoma. Two male patients were between age group of 60-65 years.

Gross examination showed tumor within the epidermis limited by horizontal line. (Figure 4A and 4B)

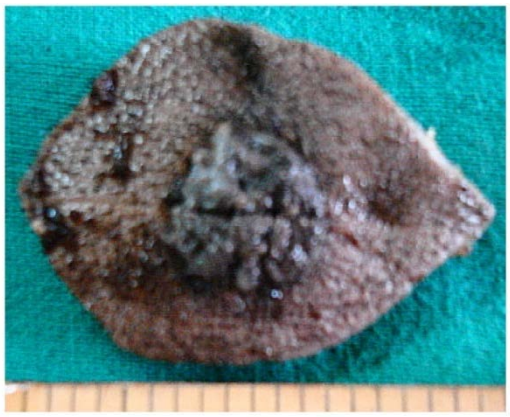


Figure 4A : Seborrheic keratosis-Gross: shows excised tumor arising from the skin surface

Figure 4B : Cut section of A showing tumor limited to the epidermis above a horizontal line

Histologically, all the 8 lesions were of acanthotic type showing proliferation of basaloid cells with horn cysts and infiltration of dermis with chronic inflammatory cells. One case showed melanin pigment in the basaloid cells. (Figure 5)

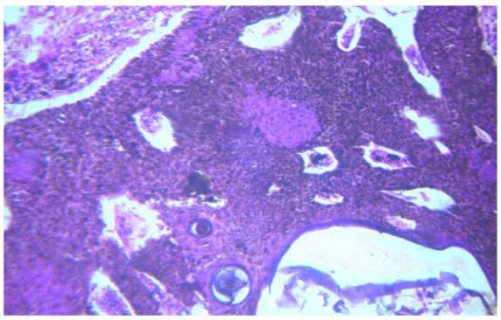


Figure 5 : Seborrheic keratosis- HP: Sheets of basaloid cells with increased melanocytes. Intervening horn cysts are also made out(100X)

ii. *Keratoacanthoma*

Four cases of keratoacanthoma were encoun - tered.These were solitary lesion over the expo -sed area in old males of few months duration.

Histologically, it showed a central keratin filled crater and proliferation of epidermis form the base of the crater into the dermis. Dermis showed chronic inflammatory cell infiltrates.

iii. *Warty dyskeratoma*

Two cases of warty dyskeratoma were encou - ntered. These were solitary lesions over the scalp in old females.

Histologically, it showed hyperkeratosis, acant - hosis, parakeratosis and cup shaped invagination of the epidermis filled with keratinous material. Dermis showed chronic inflammatory cell infiltrates.

IV. Discussion

Skin tumors constitute a small but significant proportion of patients with cancer. Skin tumors are an ideal subject for study from clinical, morphological and therapeutic point of view and are so ubiquitous that they can affect people of all ages.

In this study, the WHO classification of skin tumors[5] was followed. All non-neoplastic lesions and dermal tumors were excluded from this study. However, keratoacanthoma and warty dyskeratoma have been included under benign tumors of epidermis following the recent classification of tumors of epidermis by WHO.[6]

During this 18 month study period (November 2005 to April 2007) a total of 790 specimens of neopl - asms were received in the Department of Path -ology, K.R. Hospital, Mysore. Out of these, tumors of epide - rmis, epidermal adnexal and melanogenic system were 54, constituting 6.83%.

In the present study it was observed that malignant epidermal tumors were the most common (61%), followed by benign tumors of epidermal appen - dages (13%), benign tumors of epidermis (11%), malig - nant melanogenic tumors (9%), malignant adnexal neo - plasms (4%) and benign melanogenic tumor (2%).

Of these 54 cases studied, the ratio of benign (14) to malignant tumors (40) was 1:2.85.

In India, skin cancers constitute about 1-2% of all diagnosed cancers. Various cancer registries in India reported cumulative incidence of skin cancer varying from 0.5 to 2 per 1,00,000 population.[7]

V. Conclusion

Skin tumors constitute a small but significant proportion of patients with cancer. The anxiety of the patients to differentiate benign from malignant tumors, can be solved by histopathology. Histopathological study is one of the most valuable means of diagnosis in dermatology and diagnosis of skin tumors can be done by correlating clinical features gross and histological appearances. In this study advance age and male preponderance seen, maybe because of excess sun and irritants exposure.

In some cases rare entities and problems of differential diagnosis encountered maybe solved with the help of histochemical and/or electron microscopic studies.

VI. Summary

Out of 54 cases, histopathologically 40 were diagnosed as malignant and 14 as benign lesions.

The ratio of malignant to benign tumors was 2.8:1. The peak incidence of tumors was in 5th and 6th decades with a male to female ratio of 2.8:1.

Of the benign epidermal tumors, 8 (57%) were seborrheic keratosis 4(29%) keratoacanthoma and 2(14%) warty dyskeratoma.

References Références Referencias

1. Rosai J, Ackerman. Ackerman's Surgical Pathology. 9th ed. Elsevier; 1:130-87.
2. David E, Rosalie E, Ragsdale BD. Tumors of epide - rmal appendages. Histopathology of skin. 8th ed. Philadelphia: Lippincott Raven; 1997. pp. 747-804.
3. Chu DH, Haake AR, Holbrook K, Loomis CA. The structure and development of skin. 4th ed. In: Fitzp - atrick, Textbook of Dermatology in General Medi - cine. McGraw-Hill; 2003. pp. 58-88.
4. McGrath JA, Raj E, Pope FM. Anatomy and organization of human skin. 7th ed. In: Rook, Wilki-

nson, Ebling's Textbook of Dermatology. Blackwell; 2004. p. 3.1-3.84.
5. Seldon REJ. Histological typing of skin tumors. In: International Classification of Tumors. Geneva: WHO; 1974.
6. Nigel K. Tumors and cysts of the epidermis: Lever's histopathology of skin. 8th ed. Philadelphia: Lippin - cott Raven; 1997. p. 685-746.
7. Deo SV. Surgical management of skin cancers: Experience from a regional cancer centre in North India. Ind J Cancer 2005;42:145-50.

Global Journal of Medical research: C
Microbiology and Pathology
Volume 14 Issue 3 Version 1.0 Year 2014
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-4618 & Print ISSN: 0975-5888

Argan Oil as A Novel Anti-Methicillin Resistance *Staphylococcus Aureus* (MRSA), Iraq

By Dr. Habeeb Saheb Naher, Anwar Kadhim Al-Saffar, Dr.Hussein Oleiwi Al-Dahmoshi, Noor Salman Al-Khafaji, Noor Saadallah Naji & Ahmed Abbas Abed Zuwaid

Babylon University, College of Medicine, Iraq

Abstract- Methicillin-resistant Staphylococcusaureus (MRSA) infections are most medically threat, hard to treat infection among medical care units. MRSA isolates emerged from Staphylococcusaureus strain how carry mecA gene which confer their resistance to methicillin. The standard drug of choice to resolve MRSA infections is vancomycin which late replaced by teicoplanin due to their renal toxicity. During this study 20 MRSA isolates were obtained from the Central Laboratory of Babylon Health Directorate and previously diagnosed as MRSA using both phenotypic (by VITEK 2 compact system) and genotypic (mecA gene detection) diagnostics methods. Teicoplanin disk diffusion were achieved acc -ording to CLSI 2012.Well diffusion method was used to test the effects of mixture of Argan Oil and 1.5 % H2O2 with ratios: (1:1, 1:2, and 2:1 Argan oil: 1.5% H2O2). The effect of the mentioned mixtures in addition to the effect of 1.5% H2O2 alone and Argan oil alone were tested using well diffusion method according to CLSI 2012. The results of inhibition zone for mixture were recorded and compared with the inhibition of teicoplanin.

Keywords: *argan oil, mrsa, teicoplanin, tocopherol.*

GJMR-C Classification : *NLMC Code: WC 204*

Strictly as per the compliance and regulations of:

Argan Oil as A Novel Anti-Methicillin Resistance *Staphylococcus Aureus* (MRSA), Iraq

Dr. Habeeb Saheb Naher [α], Anwar Kadhim Al-Saffar [σ], Dr.Hussein Oleiwi Al-Dahmoshi [ρ], Noor Salman Al-Khafaji [ω], Noor Saadallah Naji [¥] & Ahmed Abbas Abed Zuwaid [§]

Abstract- Methicillin-resistant Staphylococcusaureus (MRSA) infections are most medically threat, hard to treat infection among medical care units. MRSA isolates emerged from *Staphylococcusaureus* strain how *carry mecA* gene which confer their resistance to methicillin. The standard drug of choice to resolve MRSA infections is vancomycin which late replaced by teicoplanin due to their renal toxicity. During this study 20 MRSA isolates were obtained from the Central Laboratory of Babylon Health Directorate and previously diagnosed as MRSA using both phenotypic (by VITEK 2 compact system) and genotypic (*mecA* gene detection) diagnostics methods. Teicoplanin disk diffusion were achieved acc -ording to CLSI 2012.Well diffusion method was used to test the effects of mixture of Argan Oil and 1.5 % H2O2 with ratios: (1:1, 1:2, and 2:1 Argan oil: 1.5% H2O2). The effect of the mentioned mixtures in addition to the effect of 1.5% H2O2 alone and Argan oil alone were tested using well diffusion method according to CLSI 2012. The results of inhibition zone for mixture were recorded and compared with the inhibition of teicoplanin. The results revealed ability of argan oil: H2O2 mixture with ration 2:1 to inhibit growth 80% of MRSA isolates and give inhibition zone similar to those of teicoplanin ≥ 14mm. This study concludes the satisfactoriness of use Argan oil as anti-MRSA medical oil with high level of safety and low level of uncomfortable effects.

Keywords: argan oil, mrsa, teicoplanin, tocopherol.

I. Introduction

Methicillin-resistant *Staphylococcusaureus* (MR – SA) is a bacterium accountable for several hard to treat infections among human. Any isolate of S. aureus that become resistant to β -lactam antibiotics, like penicillins (methicillin, dicloxacillin, nafcillin and oxa -cillin) and cephalosporins, called MRSA; while those isolates that incapable to resist these antibiotics are classified as methicillin-sensitive *Staphylococcusaureus,* or MSSA [1].*Staphylococcusaureus* is one of the most frequent bacterial causes of infections including endo -carditis, osteomyelitis and abscesses and MRSA respo -nsible for skin infection cause severe damage to the patient. The bacteriologist regard Methicillin-resistant *Staphylococcusaureus* more virulent than methicillin-sensitive Staphylococcus aureus due to fact that the resistancecause MRSA infection more challenging to treat with usual types of antibiotics and thus more risky.

Author α: Babylon University, College of Medicine, Microbiology Dept., Hilla- Iraq.

Author σ ρ ω ¥ §: Babylon University, College of Sciences, Biology Dept., Hilla- Iraq. e-mail: dr.dahmoshi@yahoo.com

MRSA is particularlyworrying in hospitals and nursing homes, where patients with open wounds, invasive de -vices, and weakened immune systems are at greater risk of infection than the general public [2].

Staphylococcusaureus mainly colonize nostrils; open wounds, intravenous catheters, and the urinary tract are also potential sites for infection.MRSA are often classified as Hospital-Associated MRSA (HA-MRSA) or Community-Associated MRSA (CA-MRSA), dependent upon the situations of disease acquisition [3].

Medical oils, essential oils and Plant extracts have importance to use for different purposes. Essential oils have been searched for their antibacterial, antifu -ngal, antiviral, insecticidal, anticancer and antioxidant properties [4]. All these plant oils were proved to have antibacterial activity which is mainly attributed to the presence of two plant phenolic compounds, thymol and carvacrol [5]. The anti-MRSA effects of many essential oils like thymus and eucalyptus oils were studied and the results revealed high sensitivity of MRSA to these oils using both disk and well diffusion methods and these effects attributed to the presence of thymol and to eucalyptol in thymus and eucalyptus respectively [6].

Argan oil is a plant oil produced from the kernels of the Argan tree (*Argania spinosa L.*) that is endemic to Morocco.The fruits of the Argan tree are nut-sizes and may be round, oval or conical in shape. The fruits are covered by a thick peel which covers the fleshy pulp. The pulp surrounds a hard-shelled nut which repr -esents approximately 25% of the weight of the fresh fruit. Contained within the nut are one to three Argan oil–rich kernels. Argan oil is extracted from the kernels, with yields varying from 30% to 55% depending on the extraction method used [7]. Argan oil consist of 42.8% oleic, 36.8% linoleic,12% palmitic, 6% stearic and <0.5% Linolenic. Argan oil contains tocopherols (vitamin E), phenols, carotenes, squalene, and fatty acids, (80% unsaturated fatty acids). The main natural phenols in argan oil are caffeic acid, oleuropein, vanillic acid, tyrosol, catechol, resorcinol, epicatechin and catechin. Depending on the extraction method, argan oil may be more resistant to oxidation than olive oil [8].

Until yet few studies concern antibacterial effect of Argan oil published. The positive antipseudomonal effect of Argan oil against pseudomonasaeruginosa isolated from burn was stated in Iraq previously [9]. While the antibacterial effect of argan oil against MRSA

not stated otherwise, the current study aimed to study the effect of argan oil against MRSA using well diffusion method in comparison with first choice antibiotics to get rid MRSA infection, Teicoplanin.

II. Material and Methods

a) Bacterial Isolates

Twenty MRSA isolates were used in this study. All isolates obtained from the Central Laboratory of Babylon Health Directorate and previously diagnosed as MRSA using both phenotypic and genotypic diagnostics methods. For more confirmation all isolates were rediagnosed using VITEK 2 compact system.

b) Well Diffusion Method

The virgin stock argan oils bring from Morocco and the mixture of Argan Oil and 1.5 % H2O2 were prepared with following ratios: (1:1, 1:2, and 2:1 Argan oil:1.5% H2O2). The effect of the mentioned mixtures in addition to the effect of 1.5% H2O2 alone and argan oil alone were tested using well diffusion method. According to CLSI 2012[10], the MRSA isolate suspension was standardized with 0.5 McFarland and the streaked on Muller Hinton agar plates and the wells made using cork poorer after inoculation of each plate with MRSA isolate. Each plate contains five wells for 1:1, 1:2, and 2:1 Argan oil: 1.5% H2O2 I addition to 1.5% H2O2 alone and Argan oil alone. The results recorder as diameter of inhibition zone and then comparing the results with the diameter of inhibition zone of commonly used antibiotic for Staphylococcusaureus treatment.

c) Disk diffusion Method

This method used to check the sensitivity of all MRSA isolates to teicoplanin according to CLSI 2012.

III. Results

The effects of Argan oil on MRSA not studied in Iraq and most of Arabian countries yet. Effect of this oil on MRSA isolates were recorded as inhibition zone (mm) and the results revealed no effect of 1.5% H2O2 alone and Argan oil alone. The effect of Argan oil: An H2O2 mixture was positive and gives same results using different ratio (1:1, 1:2 and 2:1 of Argan oil: H2O2). The mean of inhibition zone were 13.2mm, 14mm and 14.4mm respectively (figure 1).

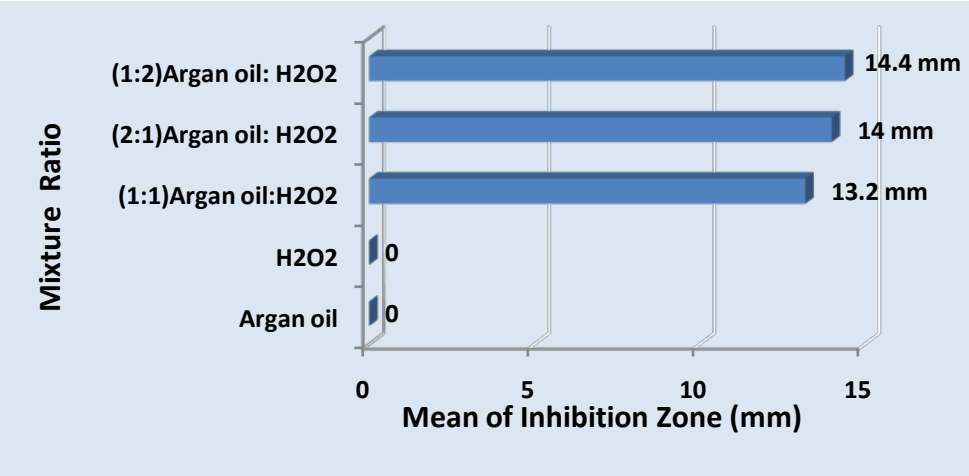


Figure 1 : Mean of inhibition zone diameter (mm)

The percentage of sensitivity of MRSA isolates were 0.00%, 0.00%, 45.00%, 80.00% and 70.00% for (Argan oil, 1.5% H2O2, 1:1, 2:1 and 1:2 ratio of Argan oil:H2O2 respectively) (figure2). All MRSA isolates show no sensitivity to argan oil alone and to H2O2 alone while 45%, 80% and 70% of isolates were sensitive to 1:1, 2:1 and 1:2 of Argan oil: H2O2 respectively.

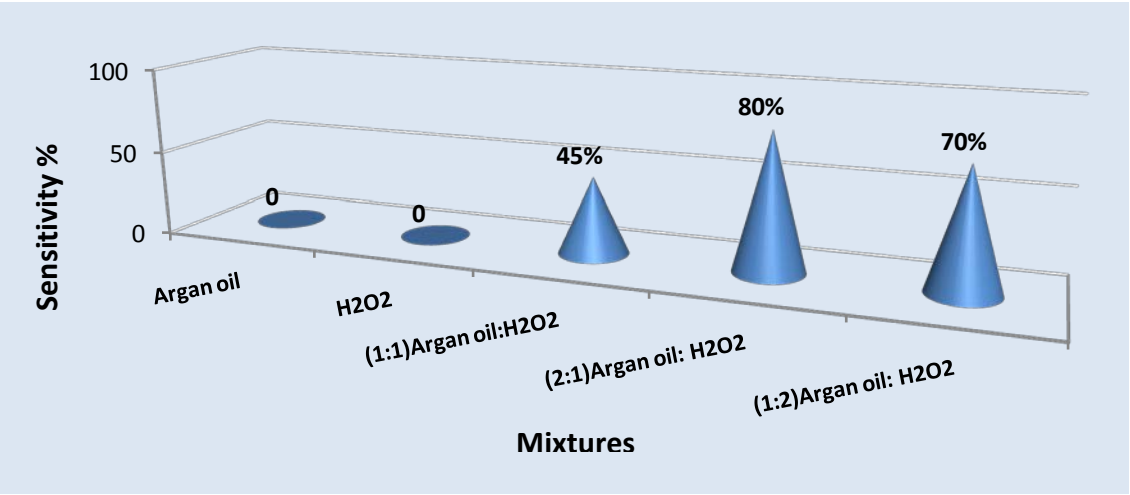


Figure 2 : Percentage of sensitive MRSA isolates toward argan oil mixtures

To increase the acceptability of Argan oil as anti-MRSA, the comparison of their effect with common antibiotics used to treat MRSA infections must be achieved. Both teicoplanin and vancomycin are effective against MRSA,but there is an apprehension that vanco -mycin may be more toxic, especially for the kidneys and so the comparison is with effect of teicop -lanin and argan oil. The results display that all isolates (100%) were sensitive to teicoplanin (inhibition zone ≥14mm) while 6(30%), 16(80%) and 11(55%) of isolates were sensitive (give same results for teicoplanin (inhibition zone ≥14mm)) to 1:1, 2:1 and 1:2 of Argan oil: H2O2 respectively table (1). The results show the similar effe -cts of argan oil and teicoplanin especially for 2:1 Argan oil: H2O2 (high argan oil concentration mixture).

Table 1 : Teicoplanin and argan oil mixture effects on MRSA isolates

Agent	Inhibition zone (mm)	Sensitivity	
		No.	%
Teicoplanin	≥14	20	100
1:1 Argan oil:H2O2	≥14	6	30
2:1 Argan oil:H2O2	≥14	16	80
1:2 Argan oil:H2O2	≥14	11	55

IV. Discussion

The central dogmas of using Argan oil as anti-MRSA agents that, herbal oil with great medical value, safe, cheap and available. The real needs to use medical or herbal oil emerged from the fact that there is little or no resistance along with reducing their disadvantageous side effects of the routine antibiotics [11]. There is no value for H2O2 as anti-MRSA and be used as solubilizer to facilitate dissemination and dispersion of Argan oil through the Muller Hinton agar plate and have the same effect as tween 20 [6].

The glycopeptides antibiotics vancomycin and teicoplanin remain the standards for treating most MRSA infections but the toxicity of vancomycin push the teicoplanin to be first choice against MRSA infections and the teicoplanin wassuperior in terms of antibacterial effects [12].the great findings that the argan oil has similar in vitro effect of teicoplanin and can be used as safely alternative medication to get rid such infections.

Argan oil consists of 42.8% oleic acid, 36.8% linoleic acid, 12% palmitic acid, 6% stearic acid and 0.5% Linolenic acid. It is also contain Unsaponifiable matter,Such as carotenes, tocopherols, triterpene alcohols, sterols, and xanthophylls. Specific health benefits of argan oils are attributed to its composition of unsaponifiable matter and high tocopherol content [13].Gamma-Tocopherol composes 69% of Argan oil total tocopherol content. Because tocopherols and sterols can act synergistically, the specific combination of molecules found in the unsaponifiable matter is theorized to contribute to the therapeutic aspects of Argan oil [14]. Previous studied revealed great effect of Argan oil on *Pseudomonasaeruginosa* isolates in Iraq [9].

V. Conclusion

Current study reveal the beneficially effect of argan oil to treat MRSA infections beside their safety for human use and accessibility in addition to their role as antioxidants.

References Références Referencias

1. Yan M., Pamp S.J., Fukuyama J., Hwang P.H., Cho D.Y., Holmes S. and Relman D.A. (2013). "Nasal microenvironments and interspecific interactions influence nasal microbiota complexity and *S.aureus carriage*". Cell Host Microbe 14 (6): 631–40.
2. Hussein O. M. Al-Dahmoshi.(2013). Genotypic investigation of intercellular adhesion loci (ICA) in *staphylococcusaureus* isolates responsible for rec - urrent skin infections in Hilla city, Iraq.Inter. J. of Advanced Boil.Research. 3(3):443-449.
3. McCaughey B. (2007). "Unnecessary Deaths: The Human and Financial Costs of Hospital Infections" (PDF) (2nd. ed.). Archived from the original on July 11, 2007.Retrieved 2007-08-05.
4. Sylvestre M., Pichette A., Longtin A., Nagau F. andLegault J. (2006). Essential oil analysis and anticancer activity of leaf essential oil of croton flavens L. form Guadeloupe. Journal of Ethnop - harmacology. 103: 99-102.
5. Chao S.C., Young D.G., Oberg C.J. (2000). Scree - ning for inhibitory activity of essential oils on selected bacteria, fungi and viruses.Journal of Essential Oil Research. 12:639-649.
6. Tohidpour A., Sattari M., Omidbaigi R., Yadegar A. andNazemi J. (2010). Antibacterial effect of esse - ntial oils from two medicinal plants against Meth - icillin-resistant Staphylococcus aureus (MRSA). Phytomedicine, 17(2):142-145.
7. Khallouki F., Younos C., Soulimani R., Oster T., Charrouf Z., Spiegelhalder B., Bartsch, H. and Owen, RW .(2003). "Consumption of argan oil (Morocco) with its unique profile of fatty acids, tocopherols, squalene, sterols and phenolic comp - ounds should confer valuable cancer chemo - preventive effects". European journal of cancer prevention 12 (1): 67–75.
8. Charrouf Z. and Guillaume D. (2007). "Phenols and Polyphenols from Argania spinosa". Am. J. of Food Technology 2 (7): 679.doi: 10.3923/ ajft.2007. 679. 683.
9. Naher H.S., Al-Dahmoshi H.O., Al-Khafaji N.S., AL-Saffar A.K. and AL-Saffar H.K. (2014). Anti-Pseud - omonal Effect of Argan Oil on *Pseudomonasaer - uginosa* Recovered from Burn Patients in Hilla City, Iraq. The Journal of Infectious Diseases. Photon 113, 270-276.
10. Clinical and Laboratory Standards Institute (CLSI).(2012). Performance standards for antimic - robial-susceptibility testing.Informational supple - ment. M 100-S22., Wayne, Pannsylvannia; 32(3):1-184.
11. Wagner H. and Ulrich-Merzenich G. (2009). Synergy research:Approaching a new generation of phytop - harmaceuticals. Phytomedicine, 16:97-110.
12. Chang Y. , Wen-Chien C., Pang-Hsin H., Dave W.C., Mel S.L., Hsin-Nung S. and Steve W. N.U. (2011). In Vitro Activities of Daptomycin-, Vancomycin-, and Teicoplanin-Loaded Polymeth - ylmethacrylate against Methicillin-Susceptible, Met - hicillin-Resistant, and Vancomycin-Intermediate Strains of *Staphylococcusaureus*. Antimicrobial. Agents and Chemotherapy, 55(12):5480–5484.
13. Charrouf Z. and Guillaume D. (2008). Argan oil: Occurrence, composition and impact on human health. European Journal of Lipid Science and Technology. 110, 632-635.
14. Monfalouti H.E., Guillaume D., Denhez C. and Charrouf Z.(2010). Therapeutic potential of Argan oil: a review. The Journal of Pharmacy and Pharma - cology. 62, 1669–75.

Global Journal of Medical research: C
Microbiology and Pathology
Volume 14 Issue 3 Version 1.0 Year 2014
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-4618 & Print ISSN: 0975-5888

Should FNAC be Restricted to an Elite Estigation-an Experience of 20,237 Aspirations Including More than 8000 Aspirations from Head and Neck Region

By Sudip Kumar Das, Sanjay Sengupta, Senjuti Dasgupta, Malabika Misra, Mamata Guha Mallick & Pranab Kumar Biswas
Medical college kolkata, India

Abstract- *Objectives:* Cytological evaluations of a vast number of cases were presented in this study. More than 2/5th of the cases were reported from head and neck region. Our objectives were to prove the diagnostic value of FNAC and to judge its feasibility in peripheral health institutes.

Method: this study was done in pathology department of Me - dical College & Hospital, Kolkata for a period of 10 years. Aspirates were classified into one of the three interpretation groups (easy, moderately difficult, and highly difficult) according to set up criteria. Cytohistological correlations were done in all possible cases.

Results: out of total 20,237 cases undergoing cytological evaluation during study period, 1774 cases (8.77%) needed guidance for aspiration.3.16%of the rest 18,463 cases could not be reported for lack of adequate aspirate.

Keywords: *fnac, interpretative categorization, large series.*

GJMR-C Classification : *NLMC Code: WC 209*

Strictly as per the compliance and regulations of:

Should FNAC be Restricted to an Elite Estigation-an Experience of 20,237 Aspirations Including More than 8000 Aspirations from Head and Neck Region

Sudip Kumar Das [α], Sanjay Sengupta [σ], Senjuti Dasgupta [ρ], Malabika Misra [ω], Mamata Guha Mallick [¥] & Pranab Kumar Biswas [§]

Abstract- Objectives: Cytological evaluations of a vast number of cases were presented in this study. More than 2/5th of the cases were reported from head and neck region. Our objectives were to prove the diagnostic value of FNAC and to judge its feasibility in peripheral health institutes.

Method: this study was done in pathology department of Me - dical College & Hospital, Kolkata for a period of 10 years. Aspirates were classified into one of the three interpretation groups (easy, moderately difficult, and highly difficult) according to set up criteria. Cytohistological correlations were done in all possible cases.

Results: out of total 20,237 cases undergoing cytological evaluation during study period, 1774 cases (8.77%) needed guidance for aspiration.3.16%of the rest 18,463 cases could not be reported for lack of adequate aspirate. Rest 17879 cases were categorized in 3 interpretation groups as follows: easy- 90.03% (16098 cases), moderately difficult- 6.72% (1203 cases), highly difficult- 3.25% (578 cases). Breast aspirates seemed comparatively easier to interpret whereas salivary aspirates were much difficult. Cytohistological correlations were possible in 5807 cases yielding 84.78% correlation. The study was alsoquite sensitive and specific in detecting malignancy with 14.93% false positive and 10.48% false negative results.

Conclusion: it is evident from the present study that FNAC is not only a useful method of tissue diagnosis but also the only cheap method requiring moderately trained personnel for interpretation in majority of cases. So its blessings should be extended to the block level.

Keywords: fnac, interpretative categorization, large series.

I. Introduction

Needle aspiration cytology was successfully utilized by Greig and Gutheri as early as 1904 for diagnosis of sleeping sickness from cervical lymphnode aspirates[1].but for the next 50 years this method of diagnosis was largely ignored due to complications like tissue injury and needle track dessim–ination[2]. Later on Cardoza (1954),Franzen, Geirtz and Zajicek (1960) etc workers introduced the technique of FNAC with lesser complications and reasonable success rate[3,4].

Last 4 decades experienced spectacular developments in the field of aspiration cytology and now it has emerged as diagnostic method of preoperative assess -ment any type of swelling. Use of thinner needle has reduced tissue injury to a minimum enabling aspiration from vascular hamartomas or large thyroid lesions[5]. Reported incidence of needle track dissem-ination after FNAC was also negligible[2]. Even testicular malignancies can now be aspirated safely[6].

FNAC is also a reasonably accurate method of diagnosis. Different workers reported more than 75% accuracy in predicting a definite diagnosis on cytological evaluation[5, 7, 8, 9, 10]. This is quite comparable with success rate of modern radiological or serological investigations. FNAC can also be used in tandem with modern radiological procedures like USG, mamm - ography, CT scans with improved diagnostic accuracy in comparison to outcome of any single procedure employed[9].

Principal limiting factor of accurate cytodia - gnosis is adequacy of aspirate[11]. In spite of repeated aspirations every worker has reported variable percent - tage of failed aspirations in their series[5, 9, 10]. Radiological guidance often helps in obtaining enha - nced amount of aspirates at the cost of increased expenditure[12]. Another major handicap of FNAC is diagnosis of a large lesion with heterogeneous tissue composition. In those cases variability of aspirates from different sites causes considerable confusion[11, 13]. Guiding methods can be helpful in choosing appropriate site / sites for aspiration in these cases[9, 12, 13].

In spite of those two serious drawbacks, FNAC became an important wing of diagnostic medicine because it delivers report with minimum expenditure of money and time in comparison to any other method with comparable safety and accuracy[12]. In our series, a large number of aspirate from all parts of body were evaluated to establish the reliability of this method of diagnosis. Aspirates from head and neck region accounted for almost half of the cases. Our main objectives were:

Author α σ ρ ω ¥ §: Medical college, Kolkata.
e-mail: misra_malabika@rediffmail.com

- To show that interpretation of aspiration in majority of the cases are simple and straight forward.
- To establish that FNAC is a cheap procedure capable of predicting final tissue diagnosis with reasonable accuracy and should be encouraged to be done at grass root level.

II. Material and Methods

This method was conducted in the Pathology department of Medical College Hospital, Kolkata for a period of 10 years (1st January, 2000 to 31st December 2010). All cases coming to pathology department for FNAC during the mentioned period were included in our study group. FNAC was done using standard proce - dures and aspirates were stained with May- Grunwald – Giemsa (MGG) stain, Haematoxylin and Eosin (E & O) stain, Papanicolaou stain[12]. Stained slides of each case were evaluated by two separate observers simultan - eously to be categorized into one of the three groups mentioned below:

- Interpretation easy:Two observers reached same definitive diagnosis on initial assessment separately without consultation of any reference material.
- Interpretation moderately difficult: two observers reached same definitive diagnosis only after consu -ltation of reference books or journals individually and / after discussion between each other.
- Interpretation highly difficult: two observers failed to substantiate a unanimous definitive diagnosis even after consultation of books and discussion between each other.

Cytological correlations were done in all the cases with available histology considering histological diagnosis as 100% accurate.

III. Observation

Table 1 : No of cases

Total cases	No. of cases needed guidance	%	No ofcases without guidance	%
20237(100%)	1774	8.77	18463	91.23

Out of 20237 cases 1774 (8.77%) needed guided aspiration.

Table 2 : adequacy of aspiration

No of cases aspirated without guidance	No. of inadequate aspirates	%	No. of adequate aspirate	
18463(100%)	584	3.16	17879	96.84

Despite repeated aspiration 584 (3.16%) cases was failed.

Table 3 : Categorization of aspirates

No. of adequate aspirate	Interpretative categorization					
	Interpretation easy		Interpretation moderately difficult		Interpretation highly difficult	
17879 (100%)	No	%	No	%	No	%
	16098	90.03	1203	6.72	578	3.25

Moderately difficult interpretation was in 6.72 %(1203) and highly difficult in 3.25%(578).

Table 4 : region wise distribution of cases

No. of cases adequately aspiration	Regions aspirated					
	Head and neck	Thorax	Superior extrimity	Inferior extrimity	Abdomen	Multiple region
17879(100%)	8466 (47.30%)	4119 (23.10%)	2693 (15.10%)	1911 (10.70%)	207 (1.10%)	483(2.70%)

Maximum no of cases (8466 / 17879) 47.30% were done from head and neck region followed by thorax (23.1%) & superior extremity (15.1%). Out of the 8466 head and neck aspirates lymph node biopsy are the most common (37.8%). Closely followed by thyroid (34.5%).

Table 5 : organ wise distribution of head and neck lesion

Total no. of aspirates from head and neck region	Organ wise distribution						
	Lymph node	Thyroid	Salivary gland	Nasal, naso & oropharyngeal	Skin and soft tissue and oral	Orbital	Multiple sites
8466 (100%)	3205 (37.8%)	2923 (34.5%)	978 (11.5%)	439 (5.2%)	386 (4.5 %)	276 (3.3%)	259 (3.2%)

Table 6 : organ wise distribution of all cases with interpretation categorization

No of adequate aspirates	Sites of aspiration	No of cases	%	Interpretation categorization					
				Easy		Moderately difficult		Highly difficult	
				No	%	No	%	No	%
17879 (100%)	Lymph node	5134	28.71	4433	86.3	402	7.8	299	5.9
	Breast	3961	22.15	3749	94.64 (max)	143	3.61 (min)	69	1.75 (min)
	Thyroid	2923	16.35	2648	90.6	216	7.38	59	2.02
	Skin and soft tissue	1957	10.94	1836	93.82	85	4.34	36	1.84
	Bone and joints	1186	6.63	1076	90.72	71	5.99	39	3.29
	Salivary glands	978	5.47	761	77.8 (min)	189	19.32 (max)	28	2.88
	Nasal & naso/oropharyngeal	439	2.45	396	90.2	34	7.74	9	2.06
	Orbital	276	1.54	257	93.11	13	4.71	6	2.18
	Intra-abdominal	138	0.77	117	84.78	9	6.52	12	8.70 (max)
	Intra-thoracic	65	0.36	54	83.07	6	9.23	5	7.70
	Multiple sites	822	4.59	771	93.79	35	4.26	16	1.95

Lymph nodes were the single most common target of aspiration (28.71%), followed by breast; thyroid, skin etc. intra-abdominal, intra-thoracic sites are the least common. Breast aspirates are easier to interpret (94.64%) but salivary gland aspirates are least easy to interpret (77.8%). Intra-abdominal cases are the most difficult (8.70%) to interpret.

Table 7 : Cytohistological correction

No. of cases with histology	cytodiagnosis	No of cases	Histological diagnosis			Cases with correction		Cases with disparity	
			Non-neoplastic	Benign	Malignant	No	%	No	%
5807 (100%)	Non-neoplastic	906	752	109	45	4923	84.78	884	15.22
	Benign	2282	50	1943	289				
	Malignant	2619	38	353	2228				

Table 8 : detection of malignancy

No of cases with histology	cytodiagnosis	No	Histological diagnosis		False positive malignant cases		False negative malignant cases		sensitivity	specificity	Predictive value	Negative predictive value
			Non malignant	Malignant	No	%	No	%				
5807 (100)	Nonmalignant	3188	2854	334	391	14.93	334	10.48	85.07	59.52	86.96	87.95
	Malignant	2619	391	2228								

It shows the efficacy in detecting malignancy of FNAC. It has sensitivity of 85.07% and specificity of 59.52%.

IV. Discussion

In the present study, 1774 cases (8.77%) were aspirated under various radiological guidance (CT scan, USG, fluoroscopy). These cases were not included in final analysis because of higher expenditure and poor availability of the guiding techniques at peripheral levels. Among the cases aspirated without guidance (18463), 3.16% (584 cases) could not be reported due to inade - quate aspirate. Reported incidence of inadequate aspir - ate in various studies ranges from 32.2% to 2.5%[7, 8, 14]. Comparatively lower incidence in our series could be attributable to repeated aspiration attempts by multiple persons in more than one sitting.

More than 90% cases (16098 out of 17879) of present group were categorized into easy to interpret, 6.72% cases were moderately difficult and 3.25% were highly difficult demanding highest level of collective expertise – only available at referral centers. Different workers reported incidence of misdiagnosis during cytological evaluation of large number of cases in their series ranging from 0% to as high as 33%[10, 9, 15, 16].

Head and neck lesion accumulated for majority of the cases (47.3%) in our series. Lymph nodes were the commonest target (37.8%) among head and neck aspirates. Similar data was also published by other researchers[10, 12].

In our study breast aspirates were comparatively easy with less than 2% cases belonging to highly difficult. Similar results were shared by other workers[8, 9]. We faced maximum difficulty during distinction between proliferative breast disease with variable dysplasia and breast carcinoma in situ as also by other researchers[17]. In cases of salivary glands only 77.8% were easy to interpret. Different workers admitted various pitfalls and problems during salivary gland aspiration study[18, 19]. 8.7% of abdominal aspirates were highly difficult to interpret.

In this study we achieved almost 85% Cyto-histological correction. Reported incidences of false positive and false negative malignant cases were 14.93% and 10.48% respectively. Sensitivity, specificity, positive and negative predictive value for detection of malignancy was between 85.07% to 89.52%. These data's quite clearly establish the diagnostic value of aspiration cytology. Comparable results were published by a lot of cytopathologists dealing with large number of cases[7, 8, 10, 16].

V. Conclusion

from the above discussion it is quite clear that FNAC is a reliable method of pathological diagnosis, for lesion of all parts of body including head and neck region.

But we want to interpret our results from another angle. During the last 4 decades diagnostic medicine has undergone a sea of changes. Unfortunately all the diagnostic approaches of recent discovery are much costly. But apart from human resources one has to spend less than RS 1000 for FNAC. Butwith routine stains cost is less than Rs 20. FNAC can quickly diagnose malignancy around 90% of cases. In developing countries FNAC is a very useful tool for tissue diagnosis.

Cytopathology should not be treated as a highly sophisticated diagnostic procedure but a cheap and efficient measure that can be used routinely by trained persons. Hope this change of approach should come soon from our community to bloom the fullest potentiality of this unique diagnostic tool.

References Références Referencias

1. Greig EDM, Grey ACH,notes on the lymphatic glands in sleeping sickness. Lancet 1904; 1: 570.
2. Engzell U, Espoti PL, Rubio C, Sigurdson A, Zajicek J, Investigation of tumour spread in conection with aspiration biopsy.Acta Cytol 1971; 10: 385- 98.
3. Cardoza PL, 1954; quated by Tao et al; 1980, Loc Cit.
4. Franzen S, Giertz gajcek J,cytological diagnosis of prostatic tumor by transrectal aspiration biopsy. Brit J Urol 1960; 32:193.
5. Amrikachi M, Ramji I, Rubenfled S, Wheeler TM, Accuracy of fine needle aspirarion of thyroid :a review of 6226 cases and correlation with surgical and clinical outcome. Arch pathol Lab Med 2001; 125, 484- 88.
6. Verma K, Ram TR, Kapila K, value of fine needle cytology in the diagnosis of testicular neoplasm. Acta Cytol 1989, 33: 630- 34.
7. Tabaqchali MA, Hanson JM, Jhonson SJ, Wadehra V, Lennard TWJ, Proud G, Thyroid aspiration cytology in Newcastle: a 6 yers cytology/ histology correlation study. Ann R Coll Surg Engl 2000; 82, 149-55.
8. Alastice OI, Lalwal OO, Olasode OO, Adesunkami ARK. Breast fine needle aspiration cytology in a Nigerian tertiary hospital. East and Central African Journal of surgery 2006;
9. Eltahir A, Jibril AJ, Squair J et al. the accuracy of one stop diagnosis for 1110 patients presenting to a symptomatic breast clinic. J R Coll. Surg Edinb. 1999 (august);44: 226- 30.
10. Jain M, Majumder DD, Agarwal KK, Bais AS, Choudhury M, FNAC a diagnostic tool in paeditric head and neck lesion. Indian paeditrics 1999; 36: 921- 23.
11. Hall TL, Layfield LJ, Phillipe A, Rosenthal DL. Sources of diagnostic error in fine needle aspiration biopsy. AM J Surg 1885; 149: 540- 45.
12. Smit TJ, Safali H, Foster EA, Reinhold RB. Accuracy and cost- effectiveness of fine needle aspiration biopsy. Am J Surg 1985: 149; 540- 45.

13. Domanski H–. Fine needle aspiration cytology of soft tissue lesion. Diagnostic challenges. Diagn Cytopathol 2007: 35; 768- 73.
14. Rekhi B, Gorag BD, Kakadc AC, Chinoy RF. Scope of FNAC in the diagnosis of soft tissue tumors – A study from tertiary cancer referral center in India, Cytojournal 2007; 4:20.
15. Gatphoh ED, Gaytri S, Babina S, Singh AM. Fine needle aspiration cytology of liver. a study of 202 cases. Indian Journa of Medical Sciences 2003; 57 (1)22-5.
16. Park IA, Kim CW, FNAC of malignant lymphoma in an area with high incidence of T- cell lymphoma. Correlation of cytologic diagnosis with histologic subtype and immunophenotype. Acta cytol1999 (Nov- Dec) ; 43(6) : 1059- 69.
17. Frost AR, Aksu A, Kurstin R, Sidway MK, can non-proliferative breast disease and proliferative breast disease without atypia be distinguished by fine needle cytology? Cancer (cancer cytopathol) 1997; 81: 22-28.
18. Boccatoo P, Altavilla G, Blandamura S, fine needle aspiration biopsy of salivary gland lesion- a reappraisal of the pitfalls and problems. Acta Cytol 1998; 42: 888-98.
19. Orell SR, Nettle WJS, fine needle aspiration biopsy of salivary gland tumors- problems and pitfalls. Pathology 1988; 20: 332-37.

Global Journals Inc. (US) Guidelines Handbook 2014

www.GlobalJournals.org

FELLOWS

FELLOW OF ASSOCIATION OF RESEARCH SOCIETY IN MEDICAL (FARSM)

Global Journals Incorporate (USA) is accredited by Open Association of Research Society (OARS), U.S.A and in turn, awards "FARSM" title to individuals.The 'FARSM' title is accorded to a selected professional after the approval of the Editor-in-Chief/Editorial Board Members/Dean.

- The "FARSM" is a dignified title which is accorded to a person's name viz. Dr. John E. Hall,Ph.D., FARSS or William Walldroff, M.S., FARSM.

FARSM accrediting is an honor. It authenticates your research activities. After recognition as FARSM, you can add 'FARSM' title with your name as you use this recognition as additional suffix to your status. This will definitely enhance and add more value and repute to your name. You may use it on your professional Counseling Materials such as CV, Resume, and Visiting Card etc.

The following benefits can be availed by you only for next three years from the date of certification:

FARSM designated members are entitled to avail a 40% discount while publishing their research papers (of a single author) with Global Journals Incorporation (USA), if the same is accepted by Editorial Board/Peer Reviewers. If you are a main author or co-author in case of multiple authors, you will be entitled to avail discount of 10%.

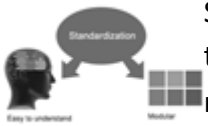
Once FARSM title is accorded, the Fellow is authorized to organize a symposium/seminar/conference on behalf of Global Journal Incorporation (USA). The Fellow can also participate in conference/seminar/symposium organized by another institution as representative of Global Journal. In both the cases, it is mandatory for him to discuss with us and obtain our consent.

You may join as member of the Editorial Board of Global Journals Incorporation (USA) after successful completion of three years as Fellow and as Peer Reviewer. In addition, it is also desirable that you should organize seminar/symposium/conference at least once.

We shall provide you intimation regarding launching of e-version of journal of your stream time to time.This may be utilized in your library for the enrichment of knowledge of your students as well as it can also be helpful for the concerned faculty members.

The FARSM can go through standards of OARS. You can also play vital role if you have any suggestions so that proper amendment can take place to improve the same for the benefit of entire research community.

As FARSM, you will be given a renowned, secure and free professional email addres with 100 GB of space e.g. johnhall@globaljournals.org. This will include Webmail, Spam Assassin, Email Forwarders,Auto-Responders, Email Delivery Route tracing, etc.



The FARSM will be eligible for a free application of standardization of their researches. Standardization of research will be subject to acceptability within stipulated norms as the next step after publishing in a journal. We shall depute a team of specialized research professionals who will render their services for elevating your researches to next higher level, which is worldwide open standardization.

The FARSM member can apply for grading and certification of standards of their educational and Institutional Degrees to Open Association of Research, Society U.S.A. Once you are designated as FARSM, you may send us a scanned copy of all of you credentials. OARS will verify, grade and certify them. This will be based on your academic records, quality of research papers published by you, and some more criteria. After certification of all your credentials by OARS, they will be published on your Fellow Profile link on website https://associationofresearch.org which will be helpful to upgrade the dignity.

The FARSM members can avail the benefits of free research podcasting in Global Research Radio with their research documents. After publishing the work, (including published elsewhere worldwide with proper authorization) you can upload your research paper with your recorded voice or you can utilize chargeable services of our professional RJs to record your paper in their voice on request.

The FARSM member also entitled to get the benefits of free research podcasting of their research documents through video clips. We can also streamline your conference videos and display your slides/ online slides and online research video clips at reasonable charges, on request.

The FARSM is eligible to earn from sales proceeds of his/her researches/reference/review Books or literature, while publishing with Global Journals. The FARSS can decide whether he/she would like to publish his/her research in a closed manner. In this case, whenever readers purchase that individual research paper for reading, maximum 60% of its profit earned as royalty by Global Journals, will be credited to his/her bank account. The entire entitled amount will be credited to his/her bank account exceeding limit of minimum fixed balance. There is no minimum time limit for collection. The FARSM member can decide its price and we can help in making the right decision.

The FARSM member is eligible to join as a paid peer reviewer at Global Journals Incorporation (USA) and can get remuneration of 15% of author fees, taken from the author of a respective paper. After reviewing 5 or more papers you can request to transfer the amount to your bank account.

MEMBER OF ASSOCIATION OF RESEARCH SOCIETY IN MEDICAL (MARSM)

The ' MARSM ' title is accorded to a selected professional after the approval of the Editor-in-Chief / Editorial Board Members/Dean.

The "MARSM" is a dignified ornament which is accorded to a person's name viz. Dr. John E. Hall, Ph.D., MARSM or William Walldroff, M.S., MARSM.

MARSM accrediting is an honor. It authenticates your research activities. Afterbecoming MARSM,you can add 'MARSM' title with your name as you use this recognition as additional suffix to your status. This will definitely enhance and add more value and repute to your name. You may use it on your professional Counseling Materials such as CV, Resume, Visiting Card and Name Plate etc.

The following benefitscan be availed by you only for next three years from the date of certification.

MARSM designated members are entitled to avail a 25% discount while publishing their research papers (of a single author) in Global Journals Inc., if the same is accepted by our Editorial Board and Peer Reviewers. If you are a main author or co-author of a group of authors, you will get discount of 10%.

As MARSM, you willbe given a renowned, secure and free professional email address with 30 GB of space e.g. johnhall@globaljournals.org. This will include Webmail, Spam Assassin, Email Forwarders,Auto-Responders, Email Delivery Route tracing, etc.

We shall provide you intimation regarding launching of e-version of journal of your stream time to time.This may be utilized in your library for the enrichment of knowledge of your students as well as it can also be helpful for the concerned faculty members.

The MARSM member can apply for approval, grading and certification of standards of their educational and Institutional Degrees to Open Association of Research, Society U.S.A.

Once you are designated as MARSM, you may send us a scanned copy of all of your credentials. OARS will verify, grade and certify them. This will be based on your academic records, quality of research papers published by you, and some more criteria.

It is mandatory to read all terms and conditions carefully.

AUXILIARY MEMBERSHIPS

Institutional Fellow of Open Association of Research Society (USA) - OARS (USA)

Global Journals Incorporation (USA) is accredited by Open Association of Research Society, U.S.A (OARS) and in turn, affiliates research institutions as "Institutional Fellow of Open Association of Research Society" (IFOARS).

The "FARSC" is a dignified title which is accorded to a person's name viz. Dr. John E. Hall, Ph.D., FARSC or William Walldroff, M.S., FARSC.

The IFOARS institution is entitled to form a Board comprised of one Chairperson and three to five board members preferably from different streams. The Board will be recognized as "Institutional Board of Open Association of Research Society"-(IBOARS).

The Institute will be entitled to following benefits:

The IBOARS can initially review research papers of their institute and recommend them to publish with respective journal of Global Journals. It can also review the papers of other institutions after obtaining our consent. The second review will be done by peer reviewer of Global Journals Incorporation (USA) The Board is at liberty to appoint a peer reviewer with the approval of chairperson after consulting us.

The author fees of such paper may be waived off up to 40%.

The Global Journals Incorporation (USA) at its discretion can also refer double blind peer reviewed paper at their end to the board for the verification and to get recommendation for final stage of acceptance of publication.

The IBOARS can organize symposium/seminar/conference in their country on behalf of Global Journals Incorporation (USA)-OARS (USA). The terms and conditions can be discussed separately.

The Board can also play vital role by exploring and giving valuable suggestions regarding the Standards of "Open Association of Research Society, U.S.A (OARS)" so that proper amendment can take place for the benefit of entire research community. We shall provide details of particular standard only on receipt of request from the Board.

The board members can also join us as Individual Fellow with 40% discount on total fees applicable to Individual Fellow. They will be entitled to avail all the benefits as declared. Please visit Individual Fellow-sub menu of GlobalJournals.org to have more relevant details.

We shall provide you intimation regarding launching of e-version of journal of your stream time to time. This may be utilized in your library for the enrichment of knowledge of your students as well as it can also be helpful for the concerned faculty members.

After nomination of your institution as "Institutional Fellow" and constantly functioning successfully for one year, we can consider giving recognition to your institute to function as Regional/Zonal office on our behalf.
The board can also take up the additional allied activities for betterment after our consultation.

The following entitlements are applicable to individual Fellows:

Open Association of Research Society, U.S.A (OARS) By-laws states that an individual Fellow may use the designations as applicable, or the corresponding initials. The Credentials of individual Fellow and Associate designations signify that the individual has gained knowledge of the fundamental concepts. One is magnanimous and proficient in an expertise course covering the professional code of conduct, and follows recognized standards of practice.

Open Association of Research Society (US)/ Global Journals Incorporation (USA), as described in Corporate Statements, are educational, research publishing and professional membership organizations. Achieving our individual Fellow or Associate status is based mainly on meeting stated educational research requirements.

Disbursement of 40% Royalty earned through Global Journals : Researcher = 50%, Peer Reviewer = 37.50%, Institution = 12.50% E.g. Out of 40%, the 20% benefit should be passed on to researcher, 15 % benefit towards remuneration should be given to a reviewer and remaining 5% is to be retained by the institution.

We shall provide print version of 12 issues of any three journals [as per your requirement] out of our 38 journals worth $ 2376 USD.

Other:

The individual Fellow and Associate designations accredited by Open Association of Research Society (US) credentials signify guarantees following achievements:

- The professional accredited with Fellow honor, is entitled to various benefits viz. name, fame, honor, regular flow of income, secured bright future, social status etc.

- In addition to above, if one is single author, then entitled to 40% discount on publishing research paper and can get 10%discount if one is co-author or main author among group of authors.
- The Fellow can organize symposium/seminar/conference on behalf of Global Journals Incorporation (USA) and he/she can also attend the same organized by other institutes on behalf of Global Journals.
- The Fellow can become member of Editorial Board Member after completing 3yrs.
- The Fellow can earn 60% of sales proceeds from the sale of reference/review books/literature/publishing of research paper.
- Fellow can also join as paid peer reviewer and earn 15% remuneration of author charges and can also get an opportunity to join as member of the Editorial Board of Global Journals Incorporation (USA)
- • This individual has learned the basic methods of applying those concepts and techniques to common challenging situations. This individual has further demonstrated an in–depth understanding of the application of suitable techniques to a particular area of research practice.

Note :

"

- In future, if the board feels the necessity to change any board member, the same can be done with the consent of the chairperson along with anyone board member without our approval.
- In case, the chairperson needs to be replaced then consent of 2/3rd board members are required and they are also required to jointly pass the resolution copy of which should be sent to us. In such case, it will be compulsory to obtain our approval before replacement.
- In case of "Difference of Opinion [if any]" among the Board members, our decision will be final and binding to everyone.

"

Process of submission of Research Paper

The Area or field of specialization may or may not be of any category as mentioned in 'Scope of Journal' menu of the GlobalJournals.org website. There are 37 Research Journal categorized with Six parental Journals GJCST, GJMR, GJRE, GJMBR, GJSFR, GJHSS. For Authors should prefer the mentioned categories. There are three widely used systems UDC, DDC and LCC. The details are available as 'Knowledge Abstract' at Home page. The major advantage of this coding is that, the research work will be exposed to and shared with all over the world as we are being abstracted and indexed worldwide.

The paper should be in proper format. The format can be downloaded from first page of 'Author Guideline' Menu. The Author is expected to follow the general rules as mentioned in this menu. The paper should be written in MS-Word Format (*.DOC,*.DOCX).

The Author can submit the paper either online or offline. The authors should prefer online submission.Online Submission: There are three ways to submit your paper:

(A) (I) First, register yourself using top right corner of Home page then Login. If you are already registered, then login using your username and password.

(II) Choose corresponding Journal.

(III) Click 'Submit Manuscript'. Fill required information and Upload the paper.

(B) If you are using Internet Explorer, then Direct Submission through Homepage is also available.

(C) If these two are not conveninet , and then email the paper directly to dean@globaljournals.org.

Offline Submission: Author can send the typed form of paper by Post. However, online submission should be preferred.

Preferred Author Guidelines

MANUSCRIPT STYLE INSTRUCTION (Must be strictly followed)

Page Size: 8.27" X 11'"

- Left Margin: 0.65
- Right Margin: 0.65
- Top Margin: 0.75
- Bottom Margin: 0.75
- Font type of all text should be Swis 721 Lt BT.
- Paper Title should be of Font Size 24 with one Column section.
- Author Name in Font Size of 11 with one column as of Title.
- Abstract Font size of 9 Bold, "Abstract" word in Italic Bold.
- Main Text: Font size 10 with justified two columns section
- Two Column with Equal Column with of 3.38 and Gaping of .2
- First Character must be three lines Drop capped.
- Paragraph before Spacing of 1 pt and After of 0 pt.
- Line Spacing of 1 pt
- Large Images must be in One Column
- Numbering of First Main Headings (Heading 1) must be in Roman Letters, Capital Letter, and Font Size of 10.
- Numbering of Second Main Headings (Heading 2) must be in Alphabets, Italic, and Font Size of 10.

You can use your own standard format also.
Author Guidelines:

1. General,

2. Ethical Guidelines,

3. Submission of Manuscripts,

4. Manuscript's Category,

5. Structure and Format of Manuscript,

6. After Acceptance.

1. GENERAL

Before submitting your research paper, one is advised to go through the details as mentioned in following heads. It will be beneficial, while peer reviewer justify your paper for publication.

Scope

The Global Journals Inc. (US) welcome the submission of original paper, review paper, survey article relevant to the all the streams of Philosophy and knowledge. The Global Journals Inc. (US) is parental platform for Global Journal of Computer Science and Technology, Researches in Engineering, Medical Research, Science Frontier Research, Human Social Science, Management, and Business organization. The choice of specific field can be done otherwise as following in Abstracting and Indexing Page on this Website. As the all Global

Journals Inc. (US) are being abstracted and indexed (in process) by most of the reputed organizations. Topics of only narrow interest will not be accepted unless they have wider potential or consequences.

2. ETHICAL GUIDELINES

Authors should follow the ethical guidelines as mentioned below for publication of research paper and research activities.

Papers are accepted on strict understanding that the material in whole or in part has not been, nor is being, considered for publication elsewhere. If the paper once accepted by Global Journals Inc. (US) and Editorial Board, will become the copyright of the Global Journals Inc. (US).

Authorship: The authors and coauthors should have active contribution to conception design, analysis and interpretation of findings. They should critically review the contents and drafting of the paper. All should approve the final version of the paper before submission

The Global Journals Inc. (US) follows the definition of authorship set up by the Global Academy of Research and Development. According to the Global Academy of R&D authorship, criteria must be based on:

1) Substantial contributions to conception and acquisition of data, analysis and interpretation of the 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.

All authors should have been credited according to their appropriate contribution in research activity and preparing paper. Contributors who do not match the criteria as authors may be mentioned under Acknowledgement.

Acknowledgements: Contributors to the research other than authors credited should be mentioned under acknowledgement. The specifications of the source of funding for the research if appropriate can be included. Suppliers of resources may be mentioned along with address.

Appeal of Decision: The Editorial Board's decision on publication of the paper is final and cannot be appealed elsewhere.

Permissions: It is the author's responsibility to have prior permission if all or parts of earlier published illustrations are used in this paper.

Please mention proper reference and appropriate acknowledgements wherever expected.

If all or parts of previously published illustrations are used, permission must be taken from the copyright holder concerned. It is the author's responsibility to take these in writing.

Approval for reproduction/modification of any information (including figures and tables) published elsewhere must be obtained by the authors/copyright holders before submission of the manuscript. Contributors (Authors) are responsible for any copyright fee involved.

3. SUBMISSION OF MANUSCRIPTS

Manuscripts should be uploaded via this online submission page. The online submission is most efficient method for submission of papers, as it enables rapid distribution of manuscripts and consequently speeds up the review procedure. It also enables authors to know the status of their own manuscripts by emailing us. Complete instructions for submitting a paper is available below.

Manuscript submission is a systematic procedure and little preparation is required beyond having all parts of your manuscript in a given format and a computer with an Internet connection and a Web browser. Full help and instructions are provided on-screen. As an author, you will be prompted for login and manuscript details as Field of Paper and then to upload your manuscript file(s) according to the instructions.

To avoid postal delays, all transaction is preferred by e-mail. A finished manuscript submission is confirmed by e-mail immediately and your paper enters the editorial process with no postal delays. When a conclusion is made about the publication of your paper by our Editorial Board, revisions can be submitted online with the same procedure, with an occasion to view and respond to all comments.

Complete support for both authors and co-author is provided.

4. MANUSCRIPT'S CATEGORY

Based on potential and nature, the manuscript can be categorized under the following heads:

Original research paper: Such papers are reports of high-level significant original research work.

Review papers: These are concise, significant but helpful and decisive topics for young researchers.

Research articles: These are handled with small investigation and applications

Research letters: The letters are small and concise comments on previously published matters.

5.STRUCTURE AND FORMAT OF MANUSCRIPT

The recommended size of original research paper is less than seven thousand words, review papers fewer than seven thousands words also.Preparation of research paper or how to write research paper, are major hurdle, while writing manuscript. The research articles and research letters should be fewer than three thousand words, the structure original research paper; sometime review paper should be as follows:

Papers: These are reports of significant research (typically less than 7000 words equivalent, including tables, figures, references), and comprise:

(a)Title should be relevant and commensurate with the theme of the paper.

(b) A brief Summary, "Abstract" (less than 150 words) containing the major results and conclusions.

(c) Up to ten keywords, that precisely identifies the paper's subject, purpose, and focus.

(d) An Introduction, giving necessary background excluding subheadings; objectives must be clearly declared.

(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, unless non-standard.

(f) Results should be presented concisely, by well-designed tables and/or figures; the same data may not be used in both; suitable statistical data should be given. All data must be obtained with attention to numerical detail in the planning stage. As reproduced design has been recognized to be important to experiments for a considerable time, the Editor has decided that any paper that appears not to have adequate numerical treatments of the data will be returned un-refereed;

(g) Discussion should cover the implications and consequences, not just recapitulating the results; conclusions should be summarizing.

(h) Brief Acknowledgements.

(i) References in the proper form.

Authors should very cautiously consider the preparation of papers to ensure that they communicate efficiently. Papers are much more likely to be accepted, if they are cautiously designed and laid out, contain few or no errors, are summarizing, and be conventional to the approach and instructions. They will in addition, be published with much less delays than those that require much technical and editorial correction.

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

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

Format

Language: The language of publication is UK English. Authors, for whom English is a second language, must have their manuscript efficiently edited by an English-speaking person before submission to make sure that, the English is of high excellence. It is preferable, that manuscripts should be professionally edited.

Standard Usage, Abbreviations, and Units: Spelling and hyphenation should be conventional to The Concise Oxford English Dictionary. Statistics and measurements should at all times be given in figures, e.g. 16 min, except for when the number begins a sentence. When the number does not refer to a unit of measurement it should be spelt in full unless, it is 160 or greater.

Abbreviations supposed to be used carefully. The abbreviated name or expression is supposed to be cited in full at first usage, followed by the conventional abbreviation in parentheses.

Metric SI units are supposed to generally be used excluding where they conflict with current practice or are confusing. For illustration, 1.4 l rather than 1.4 × 10-3 m3, or 4 mm somewhat than 4 × 10-3 m. Chemical formula and solutions must identify the form used, e.g. anhydrous or hydrated, and the concentration must be in clearly defined units. Common species names should be followed by underlines at the first mention. For following use the generic name should be constricted to a single letter, if it is clear.

Structure

All manuscripts submitted to Global Journals Inc. (US), ought to include:

Title: The title page must carry an instructive 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) wherever the work was carried out. The full postal address in addition with the e-mail address of related author must be given. Up to eleven keywords or very brief phrases have to be given to help data retrieval, mining and indexing.

Abstract, used in Original Papers and Reviews:

Optimizing Abstract for Search Engines

Many researchers searching for information online will use search engines such as Google, Yahoo or similar. By optimizing your paper for search engines, you will amplify the chance of someone finding it. This in turn will make it more likely to be viewed and/or cited in a further work. Global Journals Inc. (US) have compiled these guidelines to facilitate you to maximize the web-friendliness of the most public part of your paper.

Key Words

A major linchpin in research work for the writing research paper is the keyword search, which one will employ to find both library and Internet resources.

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

Search engines for most searches, use Boolean searching, which is somewhat different from Internet searches. The Boolean search uses "operators," words (and, or, not, and near) that enable you to expand or narrow your affords. Tips for research paper while preparing research paper are very helpful guideline of research paper.

Choice of key words is first tool of tips to write research paper. Research paper writing is an art.A few tips for deciding as strategically as possible about keyword search:

- One should start brainstorming lists of possible keywords before even begin 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 research paper?" Then consider synonyms for the important words.
- It may take the discovery of only one relevant paper to let steer in the right keyword direction because in most databases, the keywords under which a research paper is abstracted are listed with the paper.
- One should avoid outdated words.

Keywords are the key that opens a door to research work sources. Keyword searching is an art in which researcher's skills are bound to improve with experience and time.

Numerical Methods: Numerical methods used should be clear and, where appropriate, supported by references.

Acknowledgements: Please make these as concise as possible.

References

References follow the Harvard scheme of referencing. References in the text should cite the authors' names followed by the time of their publication, unless there are three or more authors when simply the first author's name is quoted followed by et al. unpublished work has to only be cited where necessary, and only in the text. Copies of references in press in other journals have to be supplied with submitted typescripts. It is necessary that all citations and references be carefully checked before submission, as mistakes or omissions will cause delays.

References to information on the World Wide Web can be given, but only if the information is available without charge to readers on an official site. Wikipedia and Similar websites are not allowed where anyone can change the information. Authors will be asked to make available electronic copies of the cited information for inclusion on the Global Journals Inc. (US) homepage at the judgment of the Editorial Board.

The Editorial Board and Global Journals Inc. (US) recommend that, citation of online-published papers and other material should be done via a DOI (digital object identifier). If an author cites anything, which does not have a DOI, they run the risk of the cited material not being noticeable.

The Editorial Board and Global Journals Inc. (US) recommend the use of a tool such as Reference Manager for reference management and formatting.

Tables, Figures and Figure Legends

Tables: Tables should be few in number, 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. Vertical lines should not be used.

Figures: Figures are supposed to be submitted as separate files. Always take in a citation in the text for each figure using Arabic numbers, e.g. Fig. 4. Artwork must be submitted online in electronic form by e-mailing them.

Preparation of Electronic Figures for Publication

Even though low quality images are sufficient for review purposes, print publication requires high quality images to prevent the final product being blurred or fuzzy. Submit (or e-mail) EPS (line art) or TIFF (halftone/photographs) files only. MS PowerPoint and Word Graphics are unsuitable for printed pictures. Do not use pixel-oriented software. Scans (TIFF only) should have a resolution of at least 350 dpi (halftone) or 700 to 1100 dpi (line drawings) in relation to the imitation size. 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: It is the rule of the Global Journals Inc. (US) for authors 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.

Figure Legends: Self-explanatory legends of all figures should be incorporated separately under the heading 'Legends to Figures'. In the full-text online edition of the journal, figure legends may possibly be truncated in abbreviated links to the full screen version. Therefore, the first 100 characters of any legend should notify the reader, about the key aspects of the figure.

6. AFTER ACCEPTANCE

Upon approval of a paper for publication, the manuscript will be forwarded to the dean, who is responsible for the publication of the Global Journals Inc. (US).

6.1 Proof Corrections

The corresponding author will receive an e-mail alert containing a link to a website or will be attached. A working e-mail address must therefore be provided for the related author.

Acrobat Reader will be required in order to read this file. This software can be downloaded

(Free of charge) from the following website:

www.adobe.com/products/acrobat/readstep2.html. This will facilitate the file to be opened, read on screen, and printed out in order for any corrections to be added. Further instructions will be sent with the proof.

Proofs must be returned to the dean at dean@globaljournals.org within three days of receipt.

As changes to proofs are costly, we inquire that you only correct typesetting errors. All illustrations are retained by the publisher. Please note that the authors are responsible for all statements made in their work, including changes made by the copy editor.

6.2 Early View of Global Journals Inc. (US) (Publication Prior to Print)

The Global Journals Inc. (US) are enclosed by our publishing's Early View service. Early View articles are complete full-text articles sent in advance of their publication. Early View articles are absolute and final. They have been completely reviewed, revised and edited for publication, and the authors' final corrections have been incorporated. Because they are in final form, no changes can be made after sending them. The nature of Early View articles means that they do not yet have volume, issue or page numbers, so Early View articles cannot be cited in the conventional way.

6.3 Author Services

Online production tracking is available for your article through Author Services. Author Services enables authors to track their article - once it has been accepted - through the production process to publication online and in print. Authors can check the status of their articles online and choose to receive automated e-mails at key stages of production. The authors will receive an e-mail with a unique link that enables them to register and have their article automatically added to the system. Please ensure that a complete e-mail address is provided when submitting the manuscript.

6.4 Author Material Archive Policy

Please note that if not specifically requested, publisher will dispose off hardcopy & electronic information submitted, after the two months of publication. If you require the return of any information submitted, please inform the Editorial Board or dean as soon as possible.

6.5 Offprint and Extra Copies

A PDF offprint of the online-published article will be provided free of charge to the related author, and may be distributed according to the Publisher's terms and conditions. Additional paper offprint may be ordered by emailing us at: editor@globaljournals.org .

Before start writing a good quality Computer Science Research Paper, let us first understand what is Computer Science Research Paper? So, Computer Science Research Paper is the paper which is written by professionals or scientists who are associated to Computer Science and Information Technology, or doing research study in these areas. If you are novel to this field then you can consult about this field from your supervisor or guide.

TECHNIQUES FOR WRITING A GOOD QUALITY RESEARCH PAPER:

1. Choosing the topic: In most cases, the topic is searched by the interest of author but it can be also suggested by the guides. You can have several topics and then you can judge that in which topic or subject you are finding yourself most comfortable. This can be done by asking several questions to yourself, like Will I be able to carry our search in this area? Will I find all necessary recourses to accomplish the search? Will I be able to find all information in this field area? If the answer of these types of questions will be "Yes" then you can choose that topic. In most of the cases, you may have to conduct the surveys and have to visit several places because this field is related to Computer Science and Information Technology. Also, you may have to do a lot of work to find all rise and falls regarding the various data of that subject. Sometimes, detailed information plays a vital role, instead of short information.

2. Evaluators are human: First thing to remember that evaluators are also human being. They are not only meant for rejecting a paper. They are here to evaluate your paper. So, present your Best.

3. Think Like Evaluators: If you are in a confusion or getting demotivated that your paper will be accepted by evaluators or not, then think and try to evaluate your paper like an Evaluator. Try to understand that what an evaluator wants in your research paper and automatically you will have your answer.

4. 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.

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

6. Use of computer is recommended: As you are doing research in the field of Computer Science, then this point is quite obvious.

7. Use right software: Always use good quality software packages. If you are not capable to judge good software then you can lose quality of your paper unknowingly. There are various software programs available to help you, which you can get through Internet.

8. Use the Internet for help: An excellent start for your paper can be by using the Google. It is an excellent search engine, where you can have your doubts resolved. You may also read some answers for the frequent question how to write my research paper or find model research paper. From the internet library you can download books. If you have all required books make important reading selecting and analyzing the specified information. Then put together research paper sketch out.

9. Use and get big pictures: Always use encyclopedias, Wikipedia to get pictures so that you can go into the depth.

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

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

12. Make all efforts: Make all efforts to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in introduction, that what is the need of a particular research paper. Polish your work by good skill of writing and always give an evaluator, what he wants.

13. Have backups: When you are going to do any important thing like making research paper, you should always have backup copies of it either in your computer or in paper. This will help you to not to lose any of your important.

14. Produce good diagrams of your own: Always try to include good charts or diagrams in your paper to improve quality. Using several and unnecessary diagrams will degrade the quality of your paper by creating "hotchpotch." So always, try to make and include those diagrams, which are made by your own to improve readability and understandability of your paper.

15. Use of direct quotes: When you do research relevant to literature, history or current affairs then use of quotes become essential but if study is relevant to science then use of quotes is not preferable.

16. Use proper verb tense: Use proper verb tenses in your paper. Use past tense, to present those events that happened. Use present tense to indicate events that are going on. Use future tense to indicate future happening events. Use of improper and wrong tenses will confuse the evaluator. Avoid the sentences that are incomplete.

17. Never use online paper: If you are getting any paper on Internet, then never use it as your research paper because it might be possible that evaluator has already seen it or maybe it is outdated version.

18. Pick a good study spot: To do your research studies always try to pick a spot, which is quiet. Every spot is not for studies. Spot that suits you choose it and proceed further.

19. Know what you know: Always try to know, what you know by making objectives. Else, you will be confused and cannot achieve your target.

20. Use good quality grammar: Always use a good quality grammar and use words that will throw positive impact on evaluator. Use of good quality grammar does not mean to use tough words, that for each word the evaluator has to go through dictionary. Do not start sentence with a conjunction. Do not fragment sentences. Eliminate one-word sentences. Ignore passive voice. Do not ever use a big word when a diminutive one would suffice. Verbs have to be in agreement with their subjects. Prepositions are not expressions to finish sentences with. It is incorrect to ever divide an infinitive. Avoid clichés like the disease. Also, always shun irritating alliteration. Use language that is simple and straight forward. put together a neat summary.

21. 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 to your topic. You may also maintain your arguments with records.

22. Never start in last minute: Always start at right time and give enough time to research work. Leaving everything to the last minute will degrade your paper and spoil your work.

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

24. Never copy others' work: Never copy others' work and give it your name because if evaluator has seen it anywhere you will be in trouble.

25. Take proper rest and food: No matter how many hours you spend for your research activity, if you are not taking care of your health then all your efforts will be in vain. For a quality research, study is must, and this can be done by taking proper rest and food.

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

27. Refresh your mind after intervals: Try to give rest to your mind by listening to soft music or by sleeping in intervals. This will also improve your memory.

28. Make colleagues: Always try to make colleagues. No matter how sharper or intelligent you are, if you make colleagues you can have several ideas, which will be helpful for your research.

29. Think technically: Always think technically. If anything happens, then search its reasons, its benefits, and demerits.

30. Think and then print: When you will go to print your paper, notice that tables are not be split, headings are not detached from their descriptions, and page sequence is maintained.

31. Adding unnecessary information: Do not add unnecessary information, like, I have used MS Excel to draw graph. Do not add irrelevant and inappropriate material. These all will create superfluous. Foreign terminology and phrases are not apropos. One should NEVER take a broad view. Analogy in script is like feathers on a snake. Not at all use a large word when a very small one would be sufficient. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Amplification is a billion times of inferior quality than sarcasm.

32. Never oversimplify everything: To add material in your research paper, never go for oversimplification. This will definitely irritate the evaluator. Be more or less specific. Also too, by no means, ever use rhythmic redundancies. Contractions aren't essential and shouldn't be there used. Comparisons are as terrible as clichés. Give up ampersands and abbreviations, and so on. Remove commas, that are, not necessary. Parenthetical words however should be together with this in commas. Understatement is all the time the complete best way to put onward earth-shaking thoughts. Give a detailed literary review.

33. Report concluded results: Use concluded results. From raw data, filter the results and then conclude your studies based on measurements and observations taken. Significant figures and appropriate number of decimal places should be used. Parenthetical remarks are prohibitive. Proofread carefully at final stage. In the end give outline to your arguments. Spot out perspectives of further study of this subject. Justify your conclusion by at the bottom of them with sufficient justifications and examples.

34. After 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 though which your research is going to be in print to 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 in 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 criterion for grading the final paper by peer-reviewers.

Final Points:

A purpose of organizing a research paper is to let people to interpret your effort selectively. The journal requires the following sections, submitted in the order listed, each section to start on a new page.

The introduction will be compiled from reference matter and will reflect the design processes or outline of basis that direct you to make study. As you will carry out the process of study, the method and process section will be constructed as like that. The result segment will show related statistics in nearly sequential order and will direct the reviewers next to the similar intellectual paths throughout the data that you took to carry out your study. The discussion section will provide understanding of the data and projections as to the implication of the results. The use of good quality references all through the paper will give the effort trustworthiness by representing an alertness of 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 the 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 evade

- Insertion a title at the foot of a page with the subsequent text on the next page
- Separating a table/chart or figure - impound each figure/table to a single page
- Submitting a manuscript with pages out of sequence

In every sections of your document

· Use standard writing style including articles ("a", "the," etc.)

· Keep on paying attention on the research topic of the paper

· Use paragraphs to split each significant point (excluding for the abstract)

· Align the primary line of each section

· Present your points in sound order

· Use present tense to report well accepted

· Use past tense to describe specific results

· Shun familiar wording, don't address the reviewer directly, and don't use slang, slang language, or superlatives

· Shun use of extra pictures - include only those figures essential to presenting results

Title Page:

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

Abstract:

The summary should be two hundred words or less. It should briefly and clearly explain the key findings reported in the manuscript--must have precise statistics. It should not have abnormal acronyms or abbreviations. It should be logical in itself. Shun citing 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 approach 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. Yet, use comprehensive sentences and do not let go readability for briefness. You can maintain it succinct by phrasing sentences so that they provide more than 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 maintain the initial two items to no more than one ruling each.

- Reason of the study - 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 quantitative data; results of any numerical analysis should be reported
- Significant conclusions or questions that track from the research(es)

Approach:

- Single section, and succinct
- As a outline of job done, it is always written in past tense
- A conceptual should situate on its own, and not submit to any other part of the paper such as a form or table
- Center on shortening results - bound background information to a verdict or two, if completely necessary
- What you account in an conceptual must be regular with what you reported in the manuscript
- Exact spelling, clearness 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 to comprehend and calculate the purpose of your study without having to submit to other works. The basis for the study should be offered. Give most important references but shun difficult to make a comprehensive appraisal of the topic. In the introduction, describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will have no attention in your result. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here. Following approach can create a valuable beginning:

- Explain the value (significance) of the study
- Shield the model - why did you employ this particular system or method? What is its compensation? You strength remark on its appropriateness from a abstract point of vision as well as point out sensible reasons for using it.
- Present a justification. Status your particular theory (es) or aim(s), and describe the logic that led you to choose them.
- Very for a short time explain the tentative propose and how it skilled 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 with every section. If you make the four points listed above, you will need a least of four paragraphs.

- Present surroundings information only as desirable in order hold up a situation. The reviewer does not desire to read the whole thing you know about a topic.
- Shape the theory/purpose 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 sound written Procedures segment allows a capable scientist to replacement 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 for the least amount of information that would permit another capable scientist to spare 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 object, mention the specific item describing a way but draw the basic principle while stating the situation. The purpose is to text 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:

- Explain materials individually only if the study is so complex that it saves liberty this way.
- Embrace particular materials, and any tools or provisions that are not frequently found in laboratories.
- Do not take in frequently found.
- If use of a definite type of tools.
- Materials may be reported in a part section or else they may be recognized along with your measures.

Methods:

- Report the method (not 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 - details how procedures were completed not how they were exclusively performed on a particular day.
- If well known procedures were used, account the procedure by name, possibly with reference, and that's all.

Approach:

- It is embarrassed or not possible to use vigorous voice when documenting methods with no using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result when script up the methods most authors use third person passive voice.
- Use standard style in this and in 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 a 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. Carry on to be to the point, by means of statistics and tables, if suitable, to present consequences most efficiently.You must obviously differentiate material that would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matter should not be submitted at all except requested by the instructor.

Content

- Sum up your conclusion in text and demonstrate them, if suitable, with figures and tables.
- In manuscript, explain each of your consequences, point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation an exacting study.
- Explain results of control experiments and comprise 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 in manuscript form.

What to stay away from

- Do not discuss or infer your outcome, report surroundings information, or try to explain anything.
- Not at all, take in raw data or intermediate calculations in a research manuscript.
- Do not present the similar data more than once.
- Manuscript should complement any figures or tables, not duplicate the identical information.
- Never confuse figures with tables - there is a difference.

Approach

- As forever, use past tense when you submit to 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 part.

Figures and tables

- If you put figures and tables at the end of the details, make certain that they are visibly distinguished from any attach appendix materials, such as raw facts
- Despite of position, each figure must be numbered one after the other and complete with subtitle
- In spite of position, each table must be titled, numbered one after the other and complete with heading
- All figure and table must be adequately complete that it could situate on its own, divide from text

Discussion:

The Discussion is expected the trickiest segment to write and describe. A lot of papers submitted for journal are discarded based on problems with the Discussion. There is no head of state for how long a 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 implication of the study. The purpose here is to offer an understanding of your results and hold up for all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of result should be visibly 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 with prospect, and let it drop at that.

- Make a decision if each premise is supported, 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 the experiment might be personalized to accomplish a new idea.
- Give details all of your remarks as much as possible, focus on mechanisms.
- Make a decision if the tentative design sufficiently addressed the theory, and whether or not it was correctly restricted.
- Try to present substitute explanations if sensible alternatives be present.
- One 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 available information
- Submit to work done by specific persons (including you) in past tense.
- Submit to generally acknowledged facts and main beliefs in present tense.

Administration Rules Listed Before Submitting Your Research Paper to Global Journals Inc. (US)

Please carefully note down following rules and regulation before submitting your Research Paper to Global Journals Inc. (US):

Segment Draft and Final Research Paper: You have to strictly follow the template of research paper. If it is not done your paper may get rejected.

- The **major constraint** is that you must independently make all content, tables, graphs, and facts that are offered in the paper. You must write each part of the paper wholly on your own. The Peer-reviewers need to identify your own perceptive of the concepts in your own terms. NEVER extract straight from any foundation, and never rephrase someone else's analysis.

- Do not give permission to anyone else to "PROOFREAD" your manuscript.

- Methods to avoid Plagiarism is applied by us on every paper, if found guilty, you will be blacklisted by all of our collaborated research groups, your institution will be informed for this and strict legal actions will be taken immediately.)
- To guard yourself and others from possible illegal use please do not permit anyone right to use to your paper and files.

Criterion for Grading a Research Paper (Compilation) by Global Journals Inc. (US)

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 Inc. (US).

Topics	Grades		
	A-B	**C-D**	**E-F**
Abstract	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
Introduction	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
Methods and Procedures	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
Result	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
Discussion	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
References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

INDEX

Global Journal of Medical Research

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

ISSN 9755896