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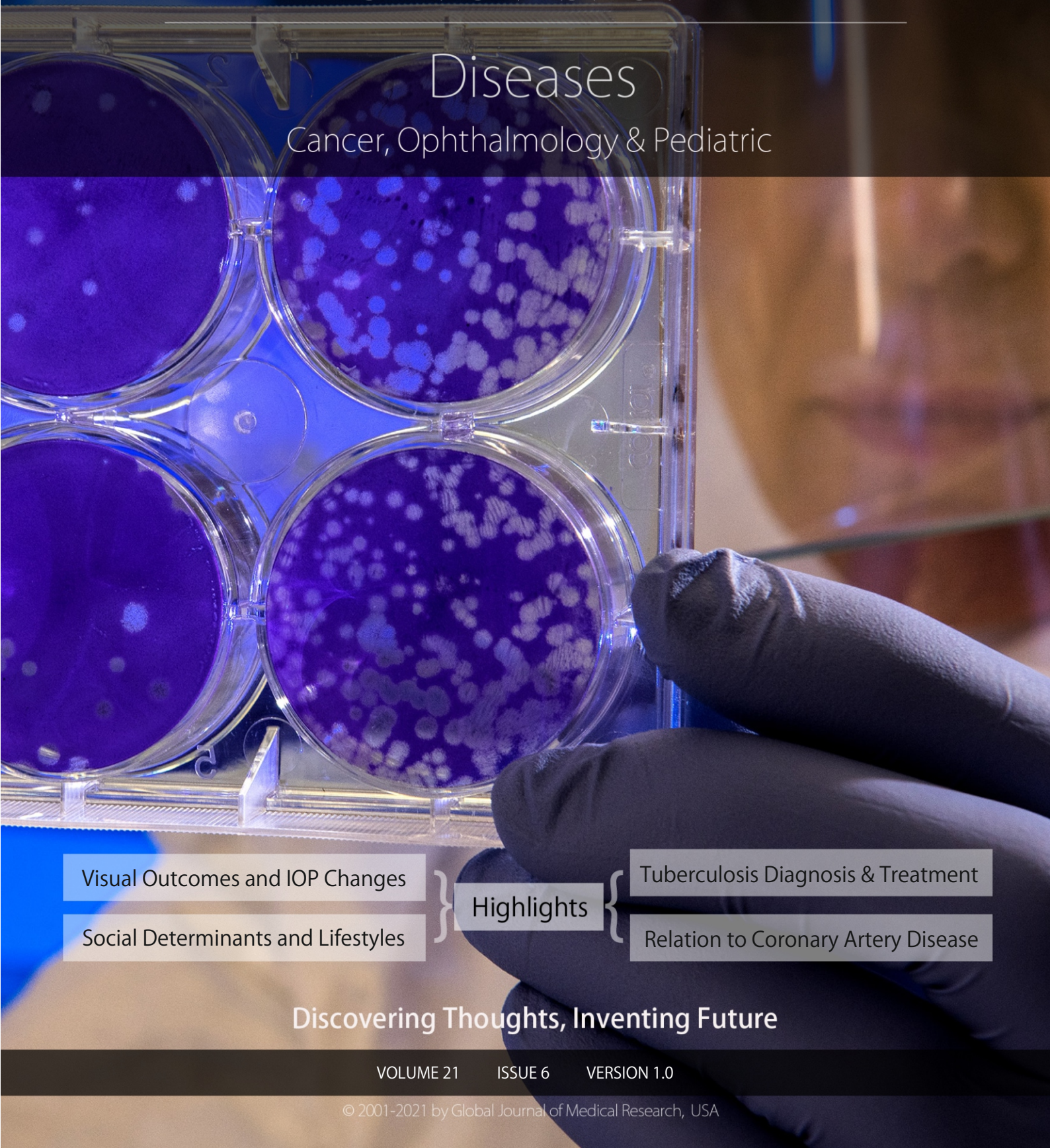

Visual Outcomes and IOP Changes

Social Determinants and Lifestyles

Highlights

Tuberculosis Diagnosis & Treatment

Relation to Coronary Artery Disease

Discovering Thoughts, Inventing Future

VOLUME 21 ISSUE 6 VERSION 1.0

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Herpes Zoster Ophthalmicus Following COVID-19 Vaccination: A Case Report

By Elisse Park MD, Christian Mays MD, Sneha Konda MD & Christopher Leffler MD

Virginia Commonwealth University

Abstract- Herpes zoster ophthalmicus is a manifestation of herpes zoster infection, typically with eye symptoms. We report a case of herpes zoster ophthalmicus in a patient who had recently received the Johnson & Johnson COVID-19 vaccine. There have been other case reports of HZO in patients who recently got the same vaccine.

GJMR-F Classification: NLMC Code: WW 168

HERPESZOSTEROPHTHALMICUSFOLLOWINGCOVID19VACCINATIONACASEREPORT

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Herpes Zoster Ophthalmicus Following COVID-19 Vaccination: A Case Report

Elisse Park MD [α], Christian Mays MD [σ], Sneha Konda MD [ρ] & Christopher Leffler MD [ω]

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I. Introduction

Herpes zoster ophthalmicus (HZO) is an uncommon manifestation of herpes Zoster which affects the ophthalmic nerve. Ophthalmic manifestations of HZO include keratitis, dermatitis, conjunctivitis, trabeculitis, retinitis, choroiditis, conjunctivitis, scleritis, episcleritis, and cranial nerve palsies.

II. Case Presentation

We report a case of herpes zoster ophthalmicus in a patient who had recently received the Johnson & Johnson COVID-19 vaccine.

A 57-year-old woman with history of hypertension and asthma was referred to the eye clinic due to concern for herpes zoster near the right eye. The patient received the Johnson & Johnson COVID-19 vaccine 5 days prior to the visit. She reports that she began having eye pain 2-3 days prior to the visit and then developed a rash.

She denied a history of cancer, diabetes mellitus, radiation therapy, or other conditions associated with systemic immunosuppression.

The visual acuity with her current glasses was 20/100 in the right eye and 20/40 in the left eye. The eye pressure was 16 in the right eye and 16 in the left eye. There was a vesicular rash on the right side of the face in the V1 distribution, including the right upper eyelid. The conjunctiva and sclera of the right eye was mildly injected, while the left eye was white and quiet. The cornea of both eyes was clear. The anterior chamber of both eyes was deep and quiet. The posterior segment exam was normal for both eyes. The patient was started on acyclovir 800 mg by mouth, 5 times daily.

The patient returned for follow up 7 days later. She felt that the rash was improving and that she was able to her open her eye more. Eye examination showed crusting of some of the vesicles (Figure 1). Her right cornea had a new epithelial defect and multiple punctate epithelial erosions (Figure 2). The patient was started on bacitracin ophthalmic ointment to the right eye and affected areas twice daily morning and night, with the option to use three times daily on affected areas if more needed, and continued acyclovir.

III. Discussion

This patient received the Johnson & Johnson (J&J) vaccine. While Pfizer and Moderna vaccines are made using mRNA to make a surface protein (known as "the spike") to activate the immune system; J&J vaccine uses a viral vectored vaccine, an adenovirus, to make spike proteins which then triggers the immune system to create antibodies.

An observational study from Israel reported 6 cases of herpes zoster (HZ) after patients with autoimmune rheumatic diseases received the BNT162b2 mRNA COVID-19 vaccine (tozinameran, Pfizer).1 Additionally, there have been case reports of patients without known autoimmune conditions that have experienced a reactivation of herpes zoster described in literature in European journals of medicine and dermatology.2 Although this correlation is new, it is not necessarily unexpected, as there are other cases of HZO reactivation with recent stress or immunomodulation, such as spaceflight, recent vaccinations against influeza, hepatits A, or rabies.3-5

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Figures

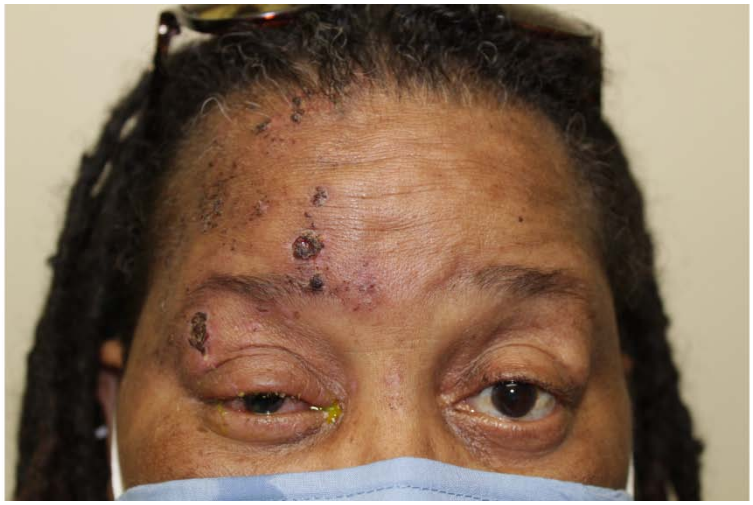

Figure 1: Vesicular rash in right V1 distribution.

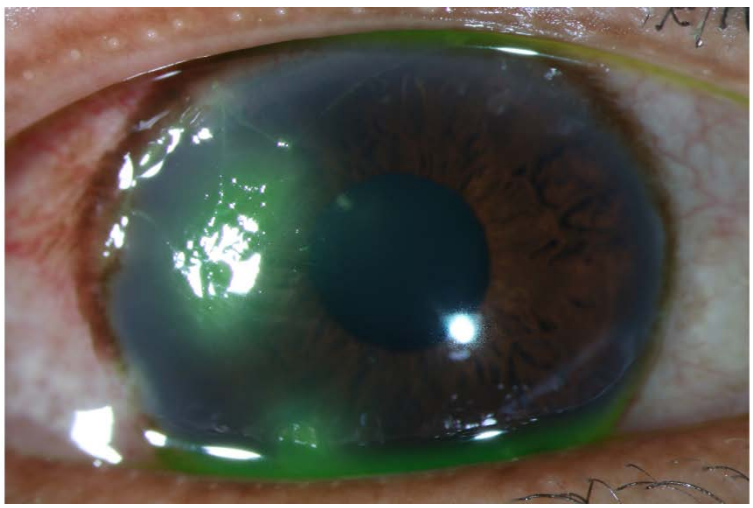

Figure 2: Epithelial defect on right cornea.

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Metabolic Syndrome in Mexican Older Adults and its Association with Social Determinants and Lifestyles

By Maria Luisa Ponce López, Ph.D., Alejandro Zarco Villavicencio, MD, Marco Antonio Cardoso Gómez, Ph.D., Irma Araceli Aburto López, MD & Bernardo Adrián Robles Aguirre, Ph.D.

Universidad Nacional Autónoma de México

Abstract- *Introduction:* The metabolic syndrome is a clinical, biochemical and anthropometric entity that precedes the possibility of intervening towards cardiometabolic risk. In an observational and cross-sectional study, the prevalence of metabolic syndrome in older adults was identified, as well as its association with health determinants, observing a greater association in women than in men due to the influence of socioeconomic conditions and lifestyles that influence health. the state of health.

Objetive: To identify the association between biological and social factors, lifestyles and the presence of metabolic syndrome in a population of older adults in Mexico City.

Material and methods: Descriptive, observational, cross-sectional and prolective study, applying a questionnaire to 161 elderly people, exploring socioeconomic variables, BMI, ICC, fasting glycemia, cholesterol, triglycerides and T/A were measured, applying ATP III / NCPE criteria for MS.

Keywords: *metabolic syndrome, older adults, social determinants, lifestyles.*

GJMR-F Classification: *NLMC Code: WD 200*

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Metabolic Syndrome in Mexican Older Adults and its Association with Social Determinants and Lifestyles

Maria Luisa Ponce López, Ph.D. [α], Alejandro Zarco Villavicencio, MD [α], Marco Antonio Cardoso Gómez, Ph.D. [α], Irma Araceli Aburto López, MD [α] & Bernardo Adrián Robles Aguirre, Ph.D. [α]

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Objetive: To identify the association between biological and social factors, lifestyles and the presence of metabolic syndrome in a population of older adults in Mexico City.

Material and methods: Descriptive, observational, cross-sectional and prolective study, applying a questionnaire to 161 elderly people, exploring socioeconomic variables, BMI, ICC, fasting glycemia, cholesterol, triglycerides and T/A were measured, applying ATP III / NCPE criteria for MS. It was analyzed with t-test and ANOVA for continuous variables, categorical variables with X^2 considering $p < 0.05$, multivariate analysis with logistic regression considering $p > 0.20$.

Results: Of 161 older adults, of 37.2% (60) men and 62.7% (101) women, BMI men 25.7 ±3.4 and women 29.6± 4.8, glucose 105.8 ± 26.4 mg / dl men and 112.4 ± 52.1 mg / dl women ($p < 0.05$) obesity I men 40.0% and 18.3% women and II is 44.6% and 41.6% respectively ($p < 0.05$), ICC men 66.6% and women 71.2% ($p < 0.05$). Women low or medium socioeconomic level 80.2% against men 41.7% ($p < .001$), alcohol consumption "has always drunk" men 71.2% comparing women 19.8% ($p < 0.05$), 93.3% men had economic income against 46.5% women ($p < 0.01$) and men 61.7%, had medical attention most of the time women 43.6%. Male gender low socioeconomic level 3.7 times risk and alcohol consumption as always 2.7 risk of MS. Women without a partner 2.1 times more risk, low or medium socioeconomic level 3.4 times risk, carried out physical activity once 2.5 times more risk and had work part of the time 2 times more risk of metabolic syndrome ($p < 0.20$).

Conclusions: There is an association between socioeconomic determinants and the presence of a metabolic syndrome with a disadvantage in females.

Keywords: metabolic syndrome, older adults, social determinants, lifestyles.

I. Introducción

El síndrome metabólico (SM) se define como el conjunto de anormalidades metabólicas que comprenden: obesidad abdominal, colesterol HDL bajo, cifras elevadas de triglicéridos, glicemia y tensión arterial, que aumentan el riesgo de mortalidad por diabetes mellitus (DM) y enfermedad cardiovascular (ECV) en la población adulta en general, [1] siendo esta última la principal causa de muerte en todo el mundo, incluyendo México. Se estima que hasta el 80% de las personas que presentan síndrome metabólico mueren por complicaciones cardiovasculares.[2]

Aunque existen múltiples criterios diagnósticos para el SM los más utilizados son los establecidos por la Organización Mundial de la Salud (OMS) y el Tercer Panel para el tratamiento de adultos del Programa Nacional de Educación en Colesterol (ATP III/NCEP) y la Federación Internacional de Diabetes.[2] En este sentido, los criterios del ATP III son los más utilizados en los estudios epidemiológicos por su aplicación clínica y práctica, debido a que son más sensibles que los de la OMS, lo que permite anticiparnos en las acciones preventivas. Aunque los componentes del SM se consideran en conjunto, es muy probable que exista una interacción causal entre ellos, ya que mientras algunos de los componentes pueden ser la causa del SM, otros probablemente sean la consecuencia de los primeros. Aún más, es posible que exista una secuencia temporal en la aparición de los distintos componentes, según sea la relación causa/efecto, prueba de ello, es la secuencia: *dieta, obesidad, resistencia a la insulina, diabetes, dislipidemia* y, finalmente, *ateroesclerosis*. [3,4] Sin embargo, esta sucesión de eventos no es invariable, ya que depende de la predisposición genética y estilos de vida de los individuos.[5]

Algunos estudios epidemiológicos han demostrado que el SM se presenta con mayor frecuencia en las personas adultas mayores, sugiriendo que los cambios metabólicos inherentes al envejecimiento podrían ser factores determinantes de la mayor prevalencia e incidencia de esta alteración durante la vejez. [6,7,8] La presencia de SM depende de numerosos factores como el exceso de peso,

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sedentarismo, tipo y calidad de la alimentación, con mayor frecuencia en los adultos mayores, debido a los cambios en la composición corporal, como disminución de la masa muscular y aumento de masa grasa, especialmente la intrabdominal [9] y en la menopausia por los cambios hormonales que llevan al incremento de tejido adiposo visceral, hiperglicemia y dislipidemia. [10]

Se ha reportado que el envejecimiento es uno de los principales factores de riesgo para el SM, ya que la prevalencia se incrementa de un 6 a 10% entre los individuos de 20 a 29 años hasta alcanzar cifras superiores al 50% en los sujetos mayores de 60 años. Al respecto se ha observado que los mayores de 65 años tienen 5 veces mayor probabilidad de presentar SM en comparación con los jóvenes de 20 a 34 años de edad, sin embargo, algunos estudios epidemiológicos muestran diferencias significativas en la prevalencia del SM en la vejez acorde con la región, sugiriendo que el envejecimiento *per se* no es un determinante de SM, sino que existen factores socioculturales vinculados con dicha alteración.[11, 12]

Existen factores determinantes biológicos, genéticos y sociales que influyen en la presencia del síndrome metabólico como el ingreso económico, el estado civil, la escolaridad y el género entre otros, que están vinculados a la aparición de la enfermedad con una distribución desigual, desarrollándose durante la historia de vida en los grupos humanos. Así mismo, los componentes clínicos y bioquímicos del SM van aumentando conforme aumenta la edad y su distribución es desigual.[13, 14,15]

El propósito del presente estudio fue determinar la presencia de SM, basada en los criterios de la OMS y el Tercer Panel para el tratamiento de adultos del Programa Nacional de Educación en Colesterol (ATP III/NCEP) en un grupo de adultos de 60 y más años de la Delegación Gustavo A. Madero de la Ciudad de México y explorar algunas asociaciones con variables sociodemográficas.

II. Material y Métodos

a) Sujetos y diseño

Se realizó un estudio observacional, transversal en una muestra de 161 ancianos (≥ 60 años); 101 mujeres y 60 hombres. Los sujetos eran residentes de la Delegación Gustavo A. Madero, de la Ciudad de México durante 5 años o más. Se distribuyeron folletos informativos en la comunidad especificando los objetivos del estudio y los criterios de admisión, como ser adultos mayores funcionales. Los sujetos aceptaron participar en el estudio dando su consentimiento informado. El Comité de Ética de la Universidad Nacional Autónoma de México, Campus Zaragoza, aprobó el protocolo de investigación para este estudio.

b) Síndrome metabólico

El SM se definió de acuerdo con los criterios establecidos en el tercer informe del Panel de expertos del Programa Nacional de Educación sobre el Colesterol sobre Detección, Evaluación y Tratamiento del Colesterol Alto en la Sangre en Adultos (Panel de Tratamiento de Adultos III).[16]

c) Medidas antropométricas

Después de registrar la historia clínica y realizar la exploración física, se obtuvieron las siguientes medidas antropométricas: peso, talla, índice de masa corporal (IMC) y circunferencia de cintura. El peso se midió mientras el sujeto vestía ropa interior y una bata de hospital y estaba en ayunas (después de la evacuación). Se utilizó una escala Torino® (Tecno Lógica Mexicana, Ciudad de México, México), calibrada antes de cada medición. La altura se obtuvo con un estadiómetro de cursor de aluminio graduado en milímetros. El sujeto estaba descalzo con la espalda y la cabeza en contacto con el estadiómetro en el plano horizontal de Frankfurt. El IMC se calculó dividiendo el peso (kg) entre la altura al cuadrado (m^2). La circunferencia de la cintura (cm) se midió con una precisión de 0.5 cm con una cinta métrica al nivel de la cicatriz umbilical.[17]

d) Presión sanguínea

La presión arterial se midió con un manómetro de mercurio en ambos brazos, tres veces por la mañana en ayunas o dos horas después del desayuno en posición sentada y de pie. Los sujetos con pseudohipertensión fueron identificados mediante la aplicación de la técnica de Osler, es decir, sintiendo el pulso radial cuando el manómetro registró valores por encima de la presión sistólica verdadera. La presión arterial fue tomada por técnicos médicos que habían asistido a sesiones de capacitación para estandarizar los procedimientos. Los técnicos fueron supervisados para evitar posibles sesgos en la medición. Se consideró presión arterial alta, según criterios de la Norma Oficial Mexicana (Norma Oficial Mexicana), si el sujeto había tenido diagnóstico previo y detección de presión arterial sistólica (PAS) ≥ 140 mmHg y / o presión arterial diastólica (PAD) ≥90 mmHg. [18]

e) Biometría hemática y química sanguínea

Los niveles de hemoglobina se midieron mediante el procedimiento de reacción de cianomehemoglobina (puntos de corte: hombres 12, 17–17.26 g/dl y mujeres 11.48–16.25 g/dl). Los niveles de hematocrito se evaluaron mediante el procedimiento de microhematocrito (puntos de corte: hombres 38–52% y mujeres 36–51%). Los recuentos de leucocitos se determinaron mediante el procedimiento de cámara de Newbauer (puntos de corte: 3500-10650/mm^3).

Los niveles de glucosa, urea, creatinina, urato, albúmina, colesterol, triglicéridos y HDL-C se

determinaron utilizando un autoanalizador Merck Vitalab Eclipse (Merck, Dieren, Países Bajos). En particular, los niveles de glucosa se midieron mediante el método de la glucosa oxidasa (puntos de corte: 63-120 mg/dl).

El colesterol se analizó mediante la técnica CHOD-PAP (puntos de corte 168-200 mg/dl) y los triglicéridos se analizaron mediante la técnica GPO-Trinder (puntos de corte 89-150 mg/dl), mientras que el HDL-C se evaluó con la misma técnica utilizada para analizar el colesterol después de la precipitación de lipoproteínas de baja y muy baja densidad utilizando una solución de ácido fosfotúngstico/cloruro de magnesio (puntos de corte 42-77 mg/dl).

Todos los reactivos utilizados en las pruebas bioquímicas se obtuvieron de Randox Laboratories Ltd. (Crumlin, Reino Unido). Los puntos de corte de los valores de referencia se determinaron en el Laboratorio de Investigaciones Clínicas Gerontológicas de la Universidad Nacional Autónoma de México (UNAM), Campus Zaragoza, Ciudad de México.[19]

f) Variables sociodemográficas y estilos de vida

Se aplicó un cuestionario a los sujetos de estudio para evaluar las siguientes variables sociodemográficas: edad, sexo, estado civil, educación, ingresos e identidades de otras personas que conviven con el sujeto. Los sujetos se clasificaron en dos categorías de edad: 60-69 y ≥70 años. Con respecto a la educación, se clasificaron en dos categorías según el número de años de escolaridad que habían recibido: baja <9 años, alta ≥9 años. Determinamos el ingreso familiar promedio: menor (≤ US $ 500/mes), mayor (> US $ 500/mes). Frecuencia de trabajo remunerado: menos frecuente (<5 veces/semana), más frecuente (≥ 5 veces/semana). Aplicamos un cuestionario de estilo de vida validado previamente en la Unidad de Investigación Gerontológica Campus Zaragoza de la UNAM a todos los sujetos; se definió como ejercicio físico: practicar tres o más veces por semana durante más de 40 minutos por sesión, durante más de un año, y sedentario: practicar menos de tres veces por semana y/o menos de 40 minutos por sesión. El consumo de alcohol se clasificó como frecuente (≥1 una vez por semana) e infrecuente (<1 vez por semana).

g) Análisis estadístico

Los datos se procesaron utilizando el software estadístico SPSS 21 (SPSS, Inc., Chicago, Ill, EE. UU.). Las estadísticas descriptivas se presentan como medias ± desviación estándar (DE). Los resultados se analizaron mediante la prueba t de Student y la prueba ANOVA para comparar las medias de todas las variables continuas entre hombres y mujeres. Las variables categóricas también se analizaron según sexo y se estimaron frecuencias y porcentajes y se utilizó la prueba X^2 y una razón de probabilidades (OR) del análisis de regresión logística con un intervalo de confianza (IC) del 95%. Se consideró significativa una p <0.05. El análisis multivariado se estimó de manera estratificada por sexo con una regresión logística que inició con un modelo completo, integrado por todas las variables categóricas. El modelo se ajustó utilizando como criterios de eliminación de variables los valores p >0.20.

III. Resultados

La muestra fue formada por 161 adultos mayores de los cuales 37.2% (n=60) son hombres y 62.7% (n= 101) son mujeres, con una media de edad de 69.9 ± 6.9 años y 66.0 ± 6.9 años, respectivamente. Con respecto a los parámetros antropométricos y bioquímicos medidos en la población se observó un IMC promedio de 26.7± 4.4 en los hombres y 29.6± 4.8 en las mujeres (*p<0.05).* El promedio de glucosa para hombres se determinó en 105.8 ± 26.4 mg/dl y para mujeres en 112.4 ± 52.1 mg/dl (*p<0.05)*. La circunferencia de la cintura en los hombres tuvo un promedio de 93.61±9.87cm y en las mujeres 101.71±10.65 cm (*p<0.05)* y el índice cintura cadera para hombres se presentó de 0.91±0.04 y para mujeres 0.89±0.06 *(p<0.05)*. Es decir se observaron en las medidas anteriores diferencias estadísticamente significativas entre hombres y mujeres. En la Tabla I se muestran las características demográficas, clínicas y bioquímicas por grupo.

Tabla I: Características basales clínicas y bioquímicas por sexo

	Mujeres (n=101)	Hombres (n=60)	*p*
Edad (años)	66.06±6.9	69.98±6.90	0.948
Glucosa (mg/dL)	112.43±52.13	105.87±26.41	**0.008**
Colesterol (mg/dL)	207.07±4.92	194.77±55.16	0.140
Triglicéridos (mg/dL)	173.31±102.41	176.67±77.49	0.385
HDL (m/dL)	58.04±11.66	57.55±9.87	0.118
Peso (kg)	69.38±9.87	63.910±10.00	**0.039**
Talla (m)	1.50±0.05	1.59±0.07	0.644
Índice de masa corporal	29.67±4.81	26.74±4.44	**0.036**
Índice de circunferencia de cintura (cm)	101.71±10.65	93.61±9.87	**0.049**
Circunferencia de cadera (cm)	102.70±9.72	101.23±9.87	0.691
Índice cintura-cadera	0.89±0.06	0.91±0.04	**0.001**
Presión arterial			
Sistólica (mmHg)	124.16±13.07	126.83±11.27	0.385
Diastólica (mmHg)	77.62±8.59	80.58±8.83	0.280

Valores medias desviación ± estándar (SE) T test p<0.05

Respecto a las características antropométricas, sociodemográficas y hábitos por sexo, se estimó una prevalencia para síndrome metabólico de 40.0% en hombres y 41.5% en mujeres, sin diferencia entre los grupos estudiados.

La prevalencia de sobrepeso tipo I y II para los hombres es 40.0% y 18.3% y en las mujeres es 44.6% y 41.6% respectivamente (*p<0.05),* el Índice cintura-cadera (según parámetros de la OMS) fue 66.6 % para hombres y 71.2% para mujeres, (p<0.05).

En cuanto la presencia de escolaridad baja (<de 9 años) fue de 70.2% para hombres y 43.3% en mujeres (*p<0.05),* el ingreso mensual bajo (<US $500) 80.2% en hombres y 41.7% en mujeres (*p<0.05),* el consumo de alcohol frecuente (≥ 1 vez por semana) en hombres fue 71.6 % y en mujeres 19.8 % (*p<0.05),* para el ingreso económico frecuente (≥5 por semana) fue 93.3% en hombres y 46.5 % en mujeres, frecuencia de trabajo remunerado frecuente (≥ 5 veces por semana) se encontró para hombres 90% y en mujeres 46.5% con diferencias estadísticamente significativas (*p<0.05).* (Tabla II).

Tabla II: Frecuencia de síndrome metabólico, características antropométricas, sociodemográficas y estilos de vida por sexo

	Hombres (n=60)		Mujeres (n=101)			
	n	%	n	%	Total	*p*
Síndrome metabólico						
Con síndrome metabólico	24	40.0	42	41.5	66	0.843
Sin síndrome metabólico	36	60.0	36	58.4	95	
Edad (años)						
60-69	32	53.3	78	77.2	110	**0.002**
70 y más	28	46.7	23	22.8	51	
IMC (según OMS)						
Normal	25	41.7	14	13.9	39	**0.001**
Obesidad I	24	40.0	45	44.6	69	
Obesidad II	11	18.3	42	41.6	53	
Índice cintura-cadera (según OMS)						
Con riesgo	40	66.6	72	71.2	112	**0.050**
Sin riesgo	20	33.3	29	28.7	49	

Estado civil						
Con pareja	35	58.3	36	45.5	71	0.115
Sin pareja	25	41.7	65	64.3	90	
Escolaridad						
Baja (<9 años)	26	43.3	71	70.2	97	0.050
Alta (≥ 9 años)	34	56.6	30	29.7	64	
Ingreso económico mensual						
Bajo (<US $500)	25	41.7	81	80.2	106	**0.001**
Medio(≥US $500)	35	58.3	20	19.8	55	
Consumo de alcohol						
Frecuente (≥ 1 vez por semana)	43	71.6	20	19.8	73	**0.038**
Infrecuente (<1 vez por semana)	17	28.3	73	72.2	87	
Actividad física						
Activo (≥ 3 veces por semana)	25	41.7	54	53.5	79	0.148
Sedentario (< 3 veces por semana)	35	58.3	47	46.5	82	
Frecuencia de ingreso económico						
Frecuente (≥5 por semana)	56	93.3	47	46.5	103	**0.001**
Infrecuente (<5 veces por semana)	4	6.7	54	53.5	58	
Frecuencia de trabajo remunerado						
Frecuente (≥ 5 veces por semana)	54	90.0	47	46.5	101	**0.001**
Infrecuente (<5 veces por semana)	6	10.0	54	53.5	60	

X^2 test $p<0.05$

El análisis multivariado de las variables sociodemográficas se muestra estratificado por sexo. En la tabla III se muestra el grupo de hombres donde se presenta como la variable de respuesta al síndrome metabólico y como variables de efecto al estado civil, escolaridad, ingreso económico, ingesta de alcohol, frecuencia de actividad física y frecuencia de ingreso económico. Se observa que el ingreso económico bajo (<US $500/mes) aumenta el riesgo de síndrome metabólico 4 veces (OR= 4.0) en comparación con los hombres con ingreso económico medio *($p<0.05$)* y el consumo de alcohol frecuente aumenta 2 veces (OR= 2.4) el riesgo de presentar síndrome metabólico en aquellos que beben respecto a los que no beben frecuentemente *($p< 0.05$)*. En relación al estado civil, escolaridad, actividad física y frecuencia de ingreso económico no encontramos diferencias significativas (Tabla III).

Tabla III: Factores de riesgo para síndrome metabólico en hombres

Variables	OR	IC 95%	Hombres (n=60) Valor de p
Edad (60-69 años)	.918	0.197-4.284	0.914
Estado civil (sin pareja)	1.8	0.402-8.442	0.432
Escolaridad (<9 años)	1.9	0.363-10.470	0.436
Ingreso económico bajo (<US $500/mes)	4.01	1.035-15.589	**0.044**
Alcohol (Frecuente)	2.4	1.003-3.016	**0.019**
Actividad física (sedentario)	.587	0.140-2.460	0.466
Frecuencia de ingreso económico (<5 veces por semana)	1.3	0.235- 8.327	0.713

Análisis multivariado estratificado por sexo, regresión logística, modelo ajustado con criterios de eliminación de $p>0.20$. Odds ratio, intervalo de confianza 95%.

En la tabla IV se presenta el modelo para el grupo de mujeres, siendo el síndrome metabólico la variable de respuesta y las variables de efecto: edad, estado civil, escolaridad, cantidad de ingreso económico, frecuente ingesta de alcohol, actividad física y frecuencia de ingreso económico. El grupo de mujeres sin pareja tiene 4 veces (OR= 4.08) más riesgo de síndrome metabólico que las mujeres con pareja *($p< 0.05$)*. Las mujeres con ingreso económico bajo (<US $500/mes) tienen 3 veces (OR= 3.44) más probabilidad de riesgo de presentar síndrome metabólico que aquellas que tuvieron ingreso económico medio *($p< 0.05$)*. Con respecto a aquellas que nunca han realizado actividad física tienen casi 5 veces (OR = 4.99) más riesgo de síndrome metabólico que las mujeres que han realizado actividad física

frecuentemente *(p< 0.05)*. En relación al ingreso económico poco frecuente (<5 veces por semana) se observó 9 veces (OR = 9.46) más riesgo de síndrome metabólico en comparación con las que contaron con ingreso económico frecuentemente *(p< 0.05)*. El odds ratio de prevalencia de riesgos de escolaridad y el consumo de alcohol en mujeres para presentar síndrome metabólico no mostró diferencias significativas entre los grupos (Tabla IV).

Tabla IV: Factores de riesgo para síndrome metabólico en mujeres

Variables	OR	IC 95%	Mujeres (n=101) Valor de p
Edad (60-69 años)	3.65	0.778-17.13	0.101
Estado civil (sin pareja)	4.08	1.24-13.37	**0.020**
Escolaridad (<9 años)	2.57	0.619-10.66	0.194
Ingreso económico(<US $500/mes)	3.44	1.28-9.23	**0.014**
Alcohol (frecuente)	1.91	0.375-9.74	0.435
Actividad física (sedentaria)	4.99	1.62-15.30	**0.005**
Frecuencia de ingreso económico (<5 veces por semana)	9.46	3.14-28.48	**0.001**

Análisis multivariado estratificado por sexo, regresión logística, modelo ajustado con criterios de eliminación de p>0.20. Odds ratio, intervalo de confianza 95%.

IV. Discusión

En esta investigación utilizando los criterios de ATP 19 encontramos una prevalencia de SM para el total de la población estudiada de 40.0% en hombres y 41.5% en mujeres, valores inferiores a los encontrados por diversos autores en estudios realizados en población adulta mayor[20,21] y superior a los encontrados por otros autores,[22] si bien fueron realizados tomando distintas definiciones de SM. El estudio de Alemán y cols., realizado en México sugiere que la presencia de SM en los adultos mayores es relativamente alta, independientemente de los antecedentes genéticos, exposición ambiental y los criterios diagnósticos utilizados.[23]

La prevalencia de obesidad central se observó de mayor grado en mujeres que en los hombres. La importancia de la obesidad visceral radica en constituir un componente que es detonante para el desarrollo de complicaciones cardiometabólicas,[24] evidencias recientes sugieren que dicha medición puede proporcionar una correlación más práctica entre la distribución de la grasa abdominal y la morbilidad y mortalidad en general; sin embargo, faltan más estudios en población adulta mayor que aporten más evidencias en este grupo de edad.[25]

Los resultados encontrados en el estudio muestran que las diferencias de género también tienen un impacto en la salud, ya que existen en muchas sociedades desventajas para las mujeres debido a los factores socioculturales, una situación que se refleja en su falta de autonomía y de recursos propios[26]. Aunque son ellas las que solicitan este servicio en mayor proporción, debido principalmente a las necesidades derivadas de su papel biológico en la reproducción, cuidado de los hijos y mayor longevidad, como lo muestran algunos autores como Garriga.[27]

El comportamiento está arraigado en los grupos sociales, influido por las diferencias socioeconómicas, de género y dependiente de los recursos disponibles, que en su naturaleza es primordialmente social. Si existen estas desventajas puede haber opciones restringidas por la limitación de sus recursos o por su información y no tener la misma oportunidad para adoptar estilos de vida más saludables.[28]

En la actualidad el análisis de los problemas de salud con enfoque en los determinantes sociales de la salud (DSS) es un marco de referencia para la investigación en diferentes áreas de la salud pública y la epidemiología. Su propósito principal es dilucidar cómo las inequidades en la distribución de los bienes sociales se manifiestan generando diferencias injustas en el estado de salud de los grupos sociales como lo afirma Moreno.[29]

Los DSS comprenden los comportamientos, estilos de vida, los ingresos, la posición social, la educación, el trabajo, las condiciones laborales, el acceso a servicios sanitarios adecuados y los entornos sobre la salud, todos ellos son importantes *per se* y están íntimamente relacionados entre sí, son acumulativos, causales y actúan en nivel individual, familiar y colectivo, y deben ser tomados en cuenta para reconocer que existe una desigualdad en salud por la disparidad social y carencia económica que existe en la sociedad,[30] de esto dependen las diferentes oportunidades y recursos relacionados con la salud que tienen las personas de distinta clase social, género, etnia o territorio, de tal forma que los grupos más desfavorecidos presentan peor salud que el resto, por lo tanto, el concepto de las desigualdades en la salud tiene también una dimensión moral y ética,[31] por lo tanto debemos considerar que el nivel de salud no depende sólo de los recursos sanitarios de que se disponen, sino

también de los factores sociales que lo determinan, como la clase social a la que se pertenezca, el trabajo que se desempeñe, el entorno en el que se habite, o la variabilidad biológica.[32]

Son escasos los estudios en donde se asocian factores sociales y síndrome metabólico, como el estudio de Alemán-Mateo y cols., en el que encontraron asociación significativa entre escolaridad, nivel socioeconómico, y actividad física con la presencia de síndrome metabólico.[25] Los resultados obtenidos en el presente estudio muestran que los determinantes sociales y estilos de vida influyen en la presencia de este padecimiento en la población de estudio de adultos mayores y estos determinantes estuvieron presentes en su historia de vida influyendo de manera importante. Como afirma la OMS [33], estos se han mantenido como el elemento central de la ideología y vida cotidiana de la humanidad en algunas poblaciones. El epidemiólogo británico Marmot,[34] propone a los determinantes sociales y condiciones de vida como aquellos que se asocian a la salud de los individuos y comunidades.

Los sistemas de salud y las comunidades científicas han explorado desde hace más de dos décadas los determinantes sociales en salud, puesto que la salud no solo depende de los servicios de salud ni las características biológicas humanas sino también a las condiciones sociales de las personas cómo viven y trabajan, llamados estilos o modos de vida, lo que impacta de manera positiva o negativa en su salud.[35]

El envejecimiento poblacional puede considerarse un éxito de las políticas de salud pública y el desarrollo socioeconómico, pero también constituye un reto para la economía, pues se está en presencia de un nuevo actor en el sistema que genera nuevas necesidades, nuevas demandas de salud, incremento de las enfermedades crónicas no trasmisibles, nuevos servicios como los de rehabilitación y más gastos de salud al sistema.[36] Evidentemente es importante modificar los entornos para disminuir su impacto sobre la salud, por lo anterior, se requieren modificaciones sustanciales en las políticas de salud y en las estructuras sociales y económicas en todo el mundo.

Como lo menciona Fernández, el síndrome metabólico se estudia con mediciones bioquímicas de triglicéridos, colesterol y glucosa; sin embargo, es importante tener en cuenta la complejidad de este síndrome, resultado de la interrelación de factores ambientales, culturales, sociales y económicos, y no conformarse con el establecimiento de un diagnóstico meramente bioquímico.[37]

V. Conclusiones

La obesidad y el síndrome metabólico son entidades clínicas complejas y heterogéneas con un fuerte componente genético, cuya expresión está influida por factores ambientales, sociales, culturales y económicos. Están asociados a las enfermedades metabólicas como la diabetes mellitus tipo 2 y enfermedades cardiovasculares prevalentes. Se observó en este estudio que existen determinantes sociales y estilos de vida asociados al síndrome metabólico con diferencias significativas por género. Los resultados demuestran que este padecimiento representa un grave problema de salud pública en nuestro entorno, que hay factores determinantes que marcan diferencias entre géneros con desventaja en las mujeres y que en estudios futuros deberán realizarse no solo en aspectos clínicos y terapéuticos, sino en aspectos socioeconómicos que influyen en forma determinante en su aparición. Sin embargo dado a que el SM en los adultos mayores tiene una complejidad diferente y asociaciones de riesgo distintas a los adultos más jóvenes, las estrategias de promoción y prevención deben enfocarse de una manera distinta, buscando siempre mejorar la calidad de vida de esta población que va en aumento.

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Barriers and Delays in Tuberculosis Diagnosis and Treatment Services: Does Gender Matter?

By Wei-Teng Yang, Celine R. Gounder, Tokunbo Akande, Jan-Walter De Neve, Katherine N. McIntire, Aditya Chandrasekhar, Alan de Lima Pereira, Naveen Gummadi, Santanu Samanta & Amita Gupta

Abstract- *Background:* Tuberculosis (TB) remains a global public health problem with known gender-related disparities. We reviewed the quantitative evidence for gender-related differences in accessing TB services from symptom onset to treatment initiation.

Methods: Following a systematic review process, we: searched 12 electronic databases; included quantitative studies assessing gender differences in accessing TB diagnostic and treatment services; abstracted data; and assessed study validity. We defined barriers and delays at the individual and provider/system levels using a conceptual framework of the TB care continuum and examined gender related differences.

Results: Among 13,448 articles, 137 were included: many assessed individual-level barriers (52%) and delays (42%), 76% surveyed persons presenting for care with diagnosed or suspected TB, 24% surveyed community members, and two thirds were from African and Asian regions. Many studies reported no gender differences.

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Conclusions: Many studies found no quantitative gender-related differences in barriers and delays limiting access to TB services. When differences were identified, women experienced greater barriers and longer delays than men.

I. Introduction

Tuberculosis (TB) remains a significant global public health issue. Significantly, the TB disease burden is unequally distributed among men and women. Of the estimated 8.7 million incident TB cases and 1.4 million deaths caused by TB globally in 2011, roughly one-third occurred among women (2.9million incident TB cases and 0.5 million deaths) [1]. Currently, it is unclear whether these disparities are due to sex-related differences (i.e., biology), gender-based differences (i.e., sociocultural practices and different social roles of men and women), or both [2–4]. Until recently, gender-related differences in the epidemiology, diagnosis, treatment, outcomes, and socioeconomic costs of TB have received relatively little attention. To address this knowledge gap, the World Health Organization (WHO) has proposed a framework and priorities for research on gender and TB [5].

To date, gender-based research supports that men and women respond differently to illness and face different barriers when accessing TB diagnostic and treatment services [2]. Barriers that limit access to TB services occur at the individual and provider/system levels. Individual-level barriers involve physical (distance to TB services and access to transport), financial (the direct and indirect costs of seeking TB services), stigma (stigma surrounding TB and its association with HIV), health literacy (TB-related knowledge and education), and sociocultural (gender roles and status in the family) factors, whereas provider/system-level barriers include provider degree of suspicion for TB, the number and types of providers seen before TB diagnosis, provider adherence to national TB program guidelines, and patient satisfaction with TB services. A comprehensive understanding of gender-related differences in barriers and delays at each level is needed so that researchers and policymakers can formulate and prioritize gender-specific interventions to improve the global impact of TB services.

Although several reviews have examined gender-related barriers and delays in seeking TB care [2, 3, 6–11], none have simultaneously assessed the contribution of both barriers and delays in a systematic manner. Furthermore, previous reviews have assessed a narrow study population. Currently, no review has captured the full continuum of TB care by including studies that have surveyed the general population, high risk populations (e.g., homeless or HIV-infected persons), TB suspects who may not have sought care (e.g., untreated individuals with chest symptoms in the community), and TB patients and suspects presenting for care.

Our review aims to address these limitations. Using a partially-adopted, published framework [5], we systematically reviewed the literature to examine the quantitative evidence for gender-related differences in

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the barriers and delays that limit access to TB services along the continuum of care from symptom onset to treatment initiation. In this report, we present the findings from our quantitative review, which have important implications for TB service programs, research, and policymakers alike.

II. Methods

a) Systematic Review Process

i. *Search Strategy:* We searched 12 electronic databases for human and English articles published between January 1953 and October 2010. We developed our search strategy for MEDLINE using PubMed with a combination of controlled vocabulary and keyword terms and phrases (see Supplementary Material available online at http://dx.doi.org/10.1155/2014/461935). The strategy was then translated for the Excerpta Medica Database (EMBASE), the Cumulative Index to Nursing and Allied Health Literature (CINAHL), Global Health, Popline, Africa Wide, LILACS, Web of Science, and the inclusive databases of the Cochrane Library using their respective thesaurus terms, synonyms, and keywords. Citations from each database were imported into a reference management system, and duplicates were removed.

ii. *Study Selection Criteria:* We included quantitative studies that reported on gender-related differences in barriers to and/or delays in accessing TB diagnostic and treatment services and studied human participants aged 15 years or older. Studies that did not provide a gender comparison as well as case reports, editorials, review articles, commentaries, practice guidelines, and studies of treatment compliance and/or outcomes were excluded. Participants were defined as persons with diagnosed or suspected TB, persons from either the general population or high-risk populations (e.g., HIV-infected, homeless, and prisoner), or health care providers. Diagnosed TB included both pulmonary and extrapulmonary forms, and TB diagnosis could be made by sputum smear microscopy, culture, or chest X-ray using histopathological or clinical criteria.

iii. *Study Selection Process:* Following deduplication, studies were reviewed sequentially by title, abstract, and in fulltext form (Figure 1). At each stage, two reviewers independently evaluated each study against study selection criteria. Articles were included or excluded only when both reviewers were in agreement, and conflicts were resolved by a third, independent reviewer (AC, AG, or CRG). To ensure sufficient concordance between reviewers, a pilot review and reviewer discussion were conducted at each stage before proceeding with the remaining studies. Six reviewers conducted the title screen (ADP, JWDN, NG, SS, TA, and WTY), and four reviewers conducted the abstract screen and the fulltext screen (ADP, JWDN, TA, and WTY). Following the full-text screen, included articles underwent the full-text assessment, which included data abstraction and a study validity assessment.

iv. *Data Abstraction:* Four reviewers (ADP, JWDN, TA, and WTY) independently abstracted quantitative data from each included full-text article in duplicate, and any conflicts were resolved through discussion with a third, independent reviewer (AG or CRG). Abstracted summary measures included differences in means or proportions, risk ratios, odds ratios, and hazards ratios.

v. *Validity Assessment:* We used validity assessment tools to examine the quality of studies that inform our review; the assessment was not used to exclude studies. We assessed observational studies using items adopted from the methods and results sections of the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist [148]. We used items adopted from the Consolidated Standards of Reporting Trials (CONSORT) checklist extension for clustered randomized trials to assess an included clustered randomized trial [149] and a pragmatic randomized controlled trial [150]. Two reviewers independently assessed the validity of each study using the adopted items (TA and WTY), and conflicts were resolved through discussion and arbitration with a third reviewer (CRG).

b) Outcomes and Definitions

Outcomes were quantitative associations between gender and both barriers and delays that limit access to TB services along the full continuum of TB care from symptom onset through diagnosis and treatment initiation. Figure 2 presents the conceptual framework that we used to define barriers and delays at the individual and provider/system levels at various time points along the continuum of TB care. Individual-level barriers were defined to be financial (the direct or indirect costs of TB care, including costs of travel, diagnosis, and/or treatment as well as the opportunity costs of lost employment, compensation, or

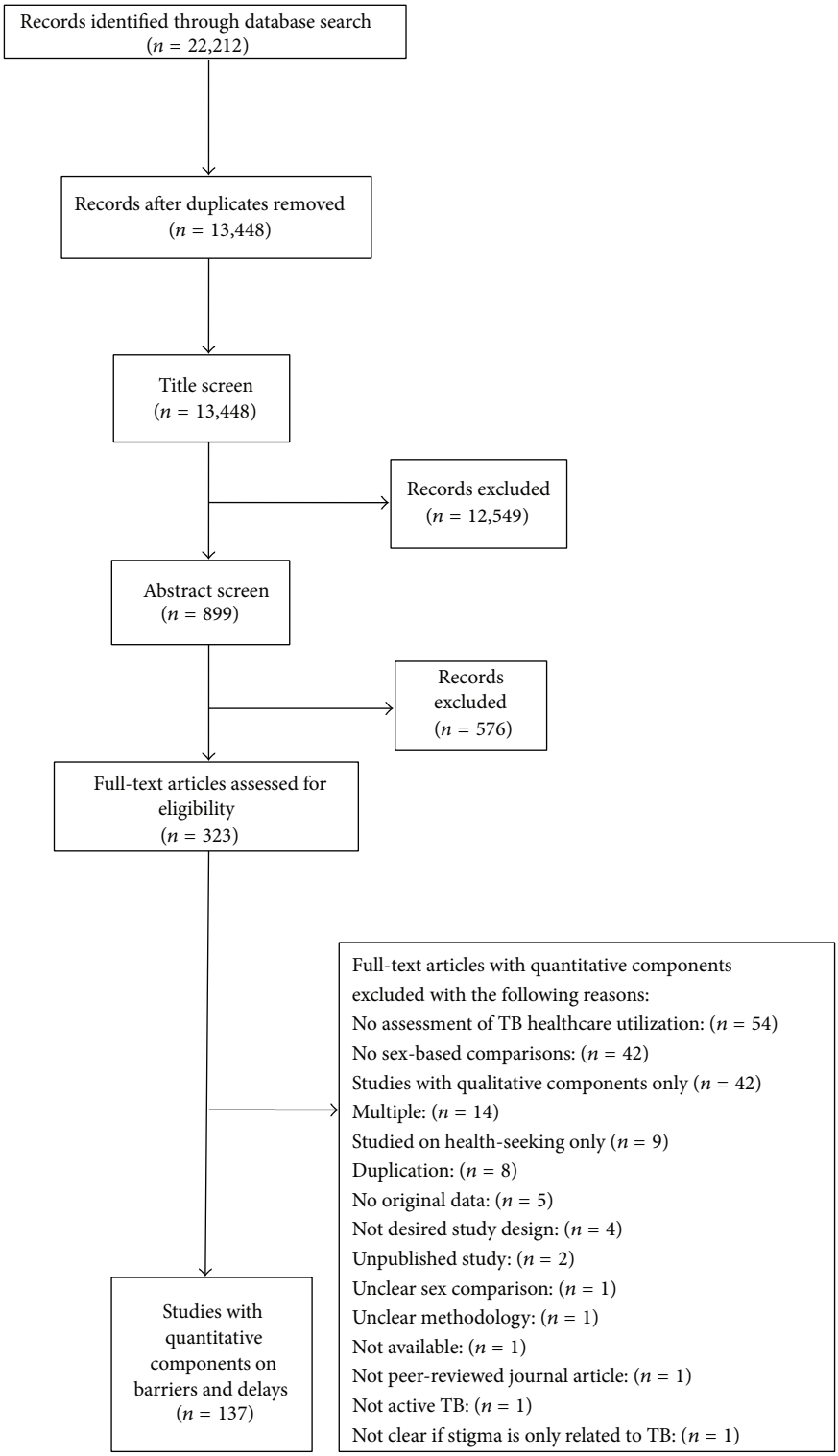

Figure 1: Study selection process

household work); physical (distance, travel logistics, and/or access to TB care facilities); stigma (TB-specific sociocultural barriers arising from community or individual prejudice related to TB diagnosis or treatment, including social isolation, marriage prospects, fertility concerns, and association with HIV); health literacy (TB-related knowledge and education); and sociodemographic (age, race, rural versus urban residence, social caste, norms of practice, and social hierarchies). Provider-/system-level barriers were defined as any of the following: provider degree of suspicion for TB, number

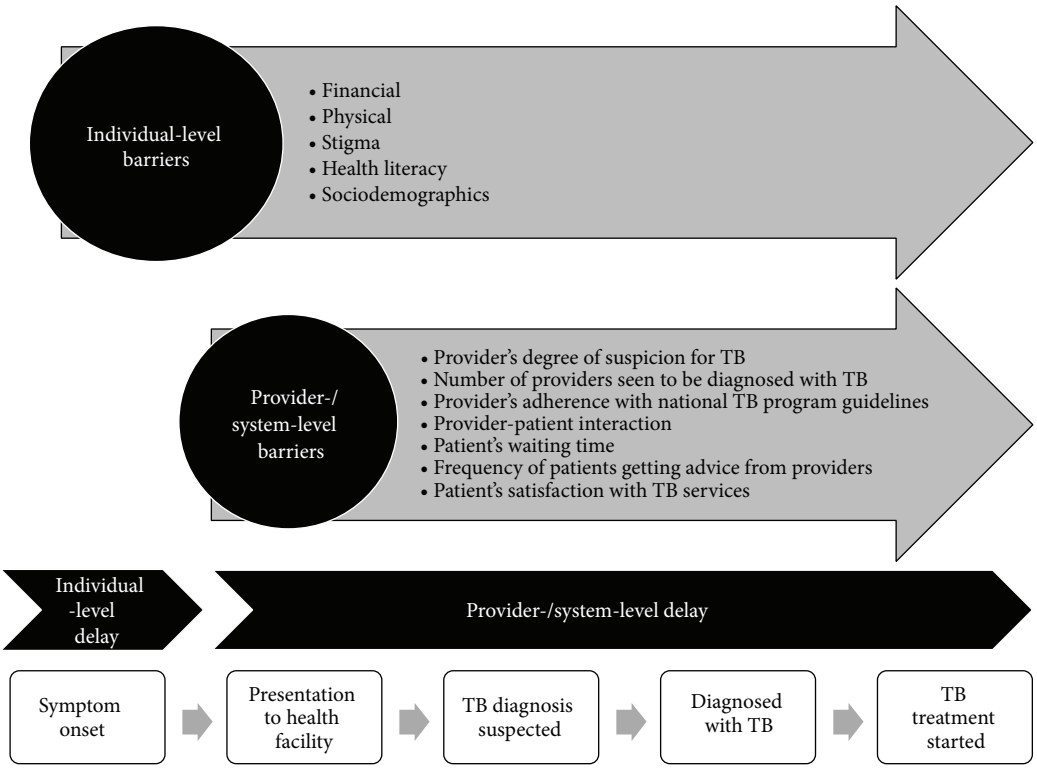

Figure 2: Conceptual framework illustrating barriers and delays that limit access to TB diagnostic and treatment services. The figure illustrates the conceptual framework of the tuberculosis (TB) care continuum from symptom onset to treatment initiation that we used to define barriers and delays that limit access to TB diagnostic and treatment services at the individual and provider/system levels. Individual-level barriers impact access to TB services along the full continuum of TB care, and provider-/system-level barriers impact access to TB services from patient presentation to any health care provider through TB treatment initiation. Barriers may contribute to delays between each step along the TB care continuum. Accordingly, we define individual-level delay as the delay between symptom onset and presentation to any health care provider; provider/system delay as the delay between presentation to any health care provider and diagnosis, the delay between presentation to any health care provider and treatment initiation or the delay between diagnosis and treatment initiation; and combined individual/provider/system delay as the delay between symptom onset and diagnosis or the delay between symptom onset and treatment initiation.

of providers seen before TB diagnosis, provider adherence to national TB program guidelines, provider-patient interaction, patient waiting time, frequency of getting advice, and patient satisfaction with TB services. Delay was defined as any time period between points along the TB care pathway under our conceptual framework from symptom onset to TB treatment initiation (Figure 2). Although barriers and delays are highly interrelated, few studies assess the contribution of barriers to delays quantitatively. Therefore, we present results for barriers and delays separately. We presented the impact of certain barriers on delays whenever possible.

III. Results

a) *Study Characteristics:* Our search strategy yielded 13,448 citations. Of these, 323 articles were reviewed in full-text form, and 137 studies met our selection criteria and were included in our review (Figure 1). Among the included studies, there was one (<1%) cluster-randomized clinical trial [91], one (<1%) pragmatic randomized controlled trial [55], eight (6%) cohort studies [33, 37, 67, 68, 87, 92, 136, 137], one (<1%) case-control study [69], and 126 (92%) cross-sectional studies [12–32, 34–36, 38–54, 56–66, 70–86, 88–90, 93–135, 138–147, 151]. Most studies (76%) assessed persons presenting for care with diagnosed or suspected TB, and the median sample size was 335 (IQR 190–1000) with women comprising less than half of the study population (median, interquartile range [IQR]: 42%, 34–49%). Most studies were published between 2000 and 2010, and two-thirds were conducted in Africa and Asia (Table 1).

b) *Outcomes:* Overall, the included studies reported on gender-related barriers and delays at the individual, provider/system, and combined individual/provider/system levels. Specifically, 71 (52%) studies assessed individual-level barriers, 19 (14%) studies assessed provider-/system-level barriers, and 7

(5%) studies assessed combined individual-/provider-/system-level barriers. Individual-level delays were assessed by 58 (42%) studies, 37 (27%) studies assessed provider/system-level delays, and 25 (18%) studies assessed combined individual-/provider-/system-level delays. Key findings are summarized below by outcome type (barrier or delay) and level of impact (individual, provider/system, combined individual/provider/system) (Table 2 and Supplementary Table S1).

Table 1: Characteristics of included studies

Study characteristic	Description
Study design: *n* (%)	Clustered randomized trial: 1 (<1%); pragmatic randomized clinical trial: 1 (<1%); cohort study: 8 (6%); case-control study: 1 (<1%); cross-sectional study: 126 (92%)
Study population: *n* (%)	Individuals with diagnosed/suspected TB who presented to care: 76%; individuals in the community or population: 24%
Year of publication: *n* (%)	2000–2010: 123 (90%); 1990–1999: 11 (8%); 1980–1989: 2 (1%); 1970–1979: 1 (1%)
WHO regional distribution: *n* (%)	AFRO: 37 (27%); SEARO: 31 (23%); WPRO: 25 (18%); AMRO: 17 (13%); EMRO: 12 (9%); EURO: 11 (8%); multiple regions: 4 (3%)
Sample size	Range: 39–209,560,379; median (IQR): 335 (190–1,000)
Proportion of women	Range: 23–73%; median (IQR): 42% (34–49%)

AFRO: African region; AMRO: region of the Americas; EMRO: Eastern Mediterranean region; EURO: European region; IQR: interquartile range; SEARO: South East Asia region; TB: tuberculosis; WHO: World Health Organization; WPRO: Western Pacific region.

c) *Individual-Level Barriers*

i. *Financial:* Of 137 studies, 21 (15%) examined gender related financial barriers to accessing TB services. Overall, a large number of studies found that women faced more financial barriers to seeking TB service than men. Fewer studies found either no difference in financial barriers between men and women or men faced greater financial barriers to accessing care (e.g., the opportunity cost of lost wages or income). While both men and women reported financial barriers to seeking TB services, the nature of these barriers differed. Women were more likely to be financially dependent on others [19, 26], unemployed, or without income [16, 17, 20]. Women also experienced greater healthcare seeking costs due to transport or the need for an escort [12, 17, 31], which may impact a woman's autonomy in seeking care. One study found that women may have also experienced greater financial barriers than men because they were more likely to see private providers than public providers [18]. The total direct costs of seeking TB diagnostic services as a proportion of income were higher for women than men in urban Zambia, largely because women had lower monthly incomes than men [13]. In Malawi, the indirect household costs of seeking care were higher for women [15].

ii. *Physical:* Of 137 studies, only nine (7%) explored gender-related physical barriers to accessing TB services. All nine studies found that distance and travel time to a health facility were similar for men and women. However, one study noted that distance to a clinic was more likely to result in delayed diagnosis among women than men [14].

iii. *Stigma:* Of 137 studies, 18% investigated gender-related differences in TB-related stigma as a barrier to accessing TB diagnostic and treatment services. Of these, 12 found no gender-related differences in stigma, 11 found that women reported greater TB-related stigma than men, and two studies found that men experienced greater TB-related stigma than women. Only two studies specifically examined the impact of TB-related stigma on gender-based differences in individual level delays in seeking TB services; one study found that the impact of stigma on delay was greater among women than men [47], and the other study found no gender-based difference [48]. Four studies examined the impact of TB related stigma on marriage and marital prospects, and all reported that women were more likely than men to believe that TB would have an adverse impact on marriage prospects and marriage [35, 39, 43, 44].

iv. *Health Literacy:* Of 137 studies, 36% described gender related differences in TB-related knowledge and education as barriers to accessing TB services, and the majority of these (80%) examined differences in knowledge of the etiology, transmission, symptoms, diagnosis, and/or treatment of TB.

Of the 39 studies that assessed TB-related health literacy, 18found that men and women had similar levels of TB-related knowledge, and, among those, six were conducted strictly in urban settings, and five were conducted in both urban and rural settings. Fourteen studies found that men had higher levels of TB-related knowledge than women; nine of these were conducted in strictly rural settings, and four were conducted in both rural and urban settings. Seven studies found that women had higher levels of TB-related knowledge than men; only one of these was conducted in a strictly rural setting. In addition, among ten studies that examined general educational attainment and literacy as barriers to accessing TB services, seven found that men were more educated and/or had higher literacy rates than women, and the remaining three studies found no gender-related differences.

Only two studies looked at the impact of TB-related knowledge and education on individual-level delays in presenting to TB services; one found that women suffered longer delays than men due to poor TB-related knowledge and education [14], and one found no gender-related differences [59]. One intervention trial found that, compared to women who did not receive brief instruction before submitting sputum samples, women who received instruction yielded significantly increased rates of both sputum positivity and return for submission of a second sputum sample. However, no significant changes were found among men who received such instruction [55]. This suggests that the intervention removed poor knowledge as a barrier for women to provide good sputum samples and to return for second sputum submission. Among two studies that examined the impact of TB-related knowledge on the likelihood of seeking tertiary level care, one found that TB-related knowledge was more predictive of seeking hospital care among men than among women [41], and one found no gender-related difference [61].

Table 2: Summary of quantitative gender-related findings by outcome type

Outcome type	Number of studies	Gender difference				No gender difference	
		Women > Men		Men > Women			
		n (%)	List of studies	*n* (%)	List of studies	*n* (%)	List of studies
Individual-level barriers							
Financial	21[a]	11 (52%)	[12–14], [15][a], [16–22]	5 (24%)	[23, 24], [15][a], [25, 26]	6 (29%)	[27–32]
Physical	9	1 (11%)	[14]			8 (89%)	[26, 30–36]
Stigma[b]	25	11 (44%)	[17, 18, 22, 37–44]	2 (8%)	[45, 46]	12 (48%)	[24–26, 35, 47–54]
Health literacy	49	17 (35%)	[26, 34–36, 38, 41, 44, 50, 55–63]	8 (16%)	[24, 28, 40, 42, 43, 64–66]	24 (50%)	[14, 20, 22, 25, 30, 37, 45–47, 51–53, 67–78]
Sociodemographic	6	4 (67%)	[17, 79–81]			2 (33%)	[36, 71]
Provider-/system- level barriers	19	8 (42%)	[17, 29, 37, 82–86]			11 (58%)	[15, 28, 34, 35, 52, 73, 75, 87–90]
Combined individual-, provider-, and system-level barriers	7	5 (72%)	[29, 91–94]	1 (14%)	[95]	1 (14%)	[18]
Individual-level delay	58	13 (22%)	[14, 17, 21, 51, 73, 79, 96–102]	7 (12%)	[37, 61, 103–107]	38 (66%)	[16, 18–20, 28, 30–32, 36, 56, 71, 81, 108–133]
Provider-/system-level delay	37	11 (30%)	[14, 19, 20, 36, 81, 85, 120, 128, 131, 134, 135]	2 (5%)	[35, 101]	24 (65%)	[16, 18, 32, 33, 79, 96, 99, 100, 104, 106, 107, 113, 115, 117, 118, 121, 122, 124, 132, 133, 136–139]
Combined individual-, provider-, and system-level delay	25[c]	9 (36%)	[140], [141][c], [27, 32, 36, 79, 100, 142, 143]	1 (4%)	[141][c]	17 (68%)	[33, 69, 110], [141][c], [35, 86, 114, 117, 124, 129, 131–133, 144–147]

a. This study is included in both gender difference categories as it reported that the direct costs of seeking care were higher for men and that the household costs of seeking care were higher for women.
b. One study was not included because the direction of association between gender and stigma could not be assessed [30].
c. This study is included in all three gender-related finding columns as it is a multicountry study and reported gender-related findings that differed from country to country.

v. *Sociodemographic:* Only six (4%) studies explored gender-related differences in sociodemographic barriers (factors of older age, family size, marital status, or caste) to accessing TB services. Older women were more likely than oldermen to either delay or not seek care [79–81]. Compared to men, lower caste was more likely to predict individual level delays among women [80], but family size had no gender-related differential impact on delays in seeking care [36]. Two studies explored the impact of being unmarried, separated, divorced, or widowed on seeking TB care [17, 71]. Among TB patients in Kenya, there was no gender-related difference in the impact of marital status on seeking care for TB [71]. However, in Bangladesh, women were more likely to be adversely affected than men [17].

d) Provider-/System-Level Barriers: Of 137 studies, 19 (14%) assessed gender-related barriers to accessing TB services at the provider and system levels. Overall, these studies were highly heterogeneous both in the barriers that were assessed and the findings.

Barriers to accessing diagnostic and/or treatment services at the provider and system levels were examined by nine (47%) studies. Of these, eight studies examined gender related barriers to TB diagnosis and screening. In Thailand, it was found that providers were more likely to adhere to TB diagnostic guidelines among males with suspected TB compared to females with suspected TB [83]. In Malawi, males and females with suspected TB made a similar number of visits to a health facility before being diagnosed with TB [15, 90], and, in India, males and females with suspected TB were offered sputum smear microscopy with similar frequency [89]. In contrast, women in Gambia sought care from a larger number of healthcare providers to obtain a TB diagnosis than men [86], and, in Vietnam, women took more health-seeking actions for their symptoms than men but were offered sputum smear examinations significantly less often [21]. Among patients hospitalized and diagnosed with TB in the United States, women faced greater provider-/system level delays in undergoing sputum smear microscopy than men [85]. However, among HIV-infected patients in the United States, men and women were screened for TB with similar frequency [87]. Only one study assessed gender related barriers to TB treatment following a diagnosis of TB and found no differences between male and female patients with respect to provider-related factors [28].

Gender-related differences in patient satisfaction with TB services were examined by seven (37%) studies [17, 34, 35, 37, 52, 73, 84]. In Nepal and Egypt, males and females with suspected TB had similar levels of satisfaction with TB services [34, 35]. However, women in Egypt were less satisfied with drug availability than men, and women in Bangladesh and Syria were less satisfied with TB clinic hours, providers, and services than men, all of which were also predictors of health seeking [17, 35, 37]. Compared to men, a greater proportion of women in Tanzania reported that a good provider-patient relationship was an important factor in their satisfaction with TB services [73]. Vietnamese TB patients reported no gender-related differences in the health education they received about their disease [52]. In another Tanzanian study where patients were randomized to community-based versus clinic-based TB treatment, male patients were more satisfied with community-based treatment than female patients [84]. Divided opinion regarding venue of treatment was noted in the study. Some patients preferred community-based treatment due to convenience, reduced transport costs, saved time, and reduced lost wages, whereas others preferred clinic based treatment because it led to greater access to other clinical services and health education [84].

The remaining three studies reported on gender-related differences in health literacy among providers and TB related hospitalization. Two studies assessed gender-based differences in TB-related knowledge among health workers and found no gender-based differences among providers in Oman and Iraq where patients may be more likely to seek care from providers of the same sex [75, 88]. One study in Tajikistan found that male TB patients were more likely to be hospitalized for treatment than female TB patients; other predictors of hospitalization in this study included positive sputum smear and availability of hospital beds [82].

e) Combined Individual-/ Provider-/ System-Level Barriers

Seven (5%) studies assessed gender-related differences in TB case detection rates, which were impacted by combined individual-/provider-/system-level barriers. Community based active case finding was one strategy used to overcome combined level barriers to accessing TB diagnostic services [152, 153]. Seven studies compared community-based active case finding versus passive case finding (i.e., self-referral). Of these, five found that community-based active case finding increased TB case detection rates more significantly among women than men [29, 91–94]; one found greater increases in case detection rates among men than women [95]; and one found no difference in the change of case detection rates between men and women [18].

f) Individual-Level Delays. Almost half of the included studies (42%) appraised gender-related differences in individual-level delays. Of these, 38 found that symptomatic women were as likely as symptomatic men to delay or not seek TB services. However, among the 20 studies that found gender-related

differences, 13 found that symptomatic women were more likely to delay or not seek TB services than symptomatic men, whereas seven studies found that symptomatic women were less likely to delay or not seek TB services than symptomatic men. The majority of studies were performed among study populations of persons who had already presented for care with diagnosed or suspected TB. Only five studies assessed persons with suspected TB in the general population. Of these, one study found that women were quicker to seek care for a prolonged cough [61], two studies found that women were slower to seek care [21, 97], and two studies found no difference in delay by gender [56,111].

g) *Provider-/System-Level Delays.* Of 137 studies, 37 (27%) assessed gender-related differences in provider-/system-level delays in accessing TB services. The time between the presentation of a person with suspected TB to a health facility and TB diagnosis was most commonly assessed. Of 22 studies, 55% found no gender-related difference in the delay from presentation to TB diagnosis. All of the remaining 10 studies found that women experienced longer delays than men. Among 13 studies that examined the delay from presentation to TB treatment initiation, nine found no gender-related difference, three found that women had longer delays than men [14, 81, 135], and only one study found that men experienced longer delays than women [101]. Similarly, among seven studies that measured the delay between TB diagnosis and TB treatment initiation, four found no gender related difference [33, 79, 104, 137], two found that women had longer delays than men [14, 19], and only one found that men had longer delays than women [35].

h) *Combined Individual-/Provider-/System-Level Delays.* Of 137 studies, 25 (18%) reported on gender-related differences in combined individual-/provider-/system-level delays. The delay between symptom onset and TB treatment initiation was most commonly assessed, and 13 out of these 18 (68%) studies found no gender-related difference. When a gender related difference was observed, women faced longer delays than men [27, 79, 100, 140, 143]. One multicountry study found that, compared to men, women experienced longer delays in Yemen and shorter delays in Egypt but similar delays in other countries [141]. Among nine studies that assessed gender-related differences in the delay between symptom onset and TB diagnosis, 5 found no gender-related difference [33, 35, 114, 133, 146], whereas four studies found that women experienced longer delays than men [32, 36, 79, 142].

i) *Quality of Included Studies.* We assessed 126 cross-sectional studies, one case-control study, and eight cohort studies using the STROBE criteria [148], and we assessed two randomized trials using the CONSORT criteria [149, 150]. The majority of studies suffered from poor quality reporting of research design, methods, analyses, and results (see Supplementary Tables S2 and S3). Key weaknesses specific to and pervasive among the cross-sectional studies (92% of included studies) were inadequate reporting regarding the numbers of males and females at each study stage from eligibility assessment through enrollment, participation, followup, and analysis; explanation of nonparticipation for males and females at each stage; information on prevalence of exposures and confounders among the male and female participants; presentation of unadjusted and confounder adjusted estimates for males and females; and explanation for selection of confounders for adjustment.

IV. Discussion

Guided by a systematic review process, our review aimed to assess the quantitative evidence for gender-related differences in the barriers and delays that impact access to TB diagnostic and treatment services at the individual and provider/system levels. While, collectively, the included studies reported on barriers and delays at each level, more studies examined individual-level barriers and delays, and most studies surveyed persons presenting for care with diagnosed or suspected TB and were conducted in Africa and Asia. Overall, our review identified that many studies found no quantitative gender-related differences. However, when differences were reported, more studies found that women experienced greater barriers and longer delays at each level than men. In particular, many studies reported gender-related differences in financial, stigma, and health literacy barriers, which are interrelated and represent potential targets for gender specific interventions that may be integrated into current and future TB service strategies.

While both genders experienced financial barriers to accessing TB services, the majority of studies that found gender-related differences reported that women experienced greater financial barriers than men, and the identified barriers were gender-specific. Specifically, the male role of primary income earner in many households prevented men from leaving work to access TB services, whereas, for women, their financial dependence on spouses and families limited access to TB services. Similar gender-related differences have been observed in financial barriers that limit access to diagnostic and treatment services for HIV and malaria [154–157]. Instituting more flexible hours and locations

for TB services may help overcome the opportunity cost of lost wages and may improve case detection and treatment initiation among men. For women, barriers due to financial dependence may be compounded by the deprioritization of women's health care within the household below the needs of men and children. Because maternal health is prioritized by some households [158], efforts to integrate TB services with maternal healthcare may overcome some financial barriers and facilitate access to TB services among some women.

Regarding TB-related stigma, our review found that women were fearful of having a diagnosis of TB disclosed to their spouse, family, or community. Women experienced greater stigma than men, when gender-related differences were found. The impact of disease-related stigma has been well studied in the context of HIV, where anticipated or experienced stigma may lead patients to conceal symptoms, avoid or delay seeking care, hide their diagnoses, and be nonadherent with treatment [159–163]. Specifically, TB has been associated with dirtiness, immorality, substance abuse, and sexual promiscuity or deviancy [164–166], and, in communities with high rates of TB/HIV coinfection, TB may be further stigmatized by its association with HIV [167]. In addition to the psychosocial consequences of a TB diagnosis, our review also found that women were concerned about marital prospects and rejection by their spouse or families. Thus, TB-related stigma may also manifest as a financial barrier among those women who depend on spouses and family for financial support.

While stigma barriers may be addressed by interventions to improve TB-related health literacy, our review suggests that such programs may be particularly beneficial for women in rural areas. Among the included studies that reported gender difference in TB-related knowledge, men had greater TB-related knowledge and higher general literacy rates than women, and the majority of these (64%) were conducted in rural settings. It may be important to examine the interaction between female literacy and the impact of poverty on care seeking as this interaction has impacted care seeking among women in the context of other health services [168,169].

Although only a few studies assessed the impact of barriers on delays, individual-level barriers appear to impact individual-level delays in TB care seeking in gender-specific ways. Symptomatic women were more likely to delay or not seek care than symptomatic men when gender-related differences in individual-level delays were reported. Individual level TB-related stigma can represent both an obstacle and a motivation to seeking care [48], and marital status, which is intimately interlinked with issues of financial and social dependency as well as spousal and family support or rejection, also had a variable impact on gender-related differences in access to services [17, 71]. Regarding sociodemographic barriers, older age was a more significant barrier to accessing TB services among women than men [79, 81]. Given the complexity of these relationships, it is important to go beyond comparing the frequency and severity of individual-level barriers among women and men. Researchers and policymakers must also understand the impact of individual-level barriers on individual-level delays and how these barriers cause delays in accessing TB services among women and men. Qualitative studies may play an invaluable role here and inform researchers on the mechanisms of barriers and delays, which can be the points of intervention in the future.

Similarly, it is important to understand gender-related differences in provider-/system-level barriers and delays. In our review, fewer studies assessed barriers and delays at the provider/system level. However, when disparities were found, women were more likely to face barriers to accessing TB services than men. In addition, gender-specific individual barriers, such as financial and stigma barriers, may also impact the provider/system level but were not assessed by the studies included in our review. Surprisingly, in the context of other diseases, there are few reports on gender-related disparities in barriers and delays that limit access to care, particularly at the provider/system levels among patients in resource-limited settings. Provider-/system-level barriers and delays that lead to gender-related disparities in health often result from the lack of attention to the different needs of men and women while planning and providing health services, particularly with respect to service availability (e.g., geographical location, transportation available, service hours, and waiting time), affordability, acceptability (e.g., social and cultural competency, respect, privacy, confidentiality, and autonomy), and accountability [170, 171]. Furthermore, health providers and health systems may compound individual-level and community-level disparities by failing to recognize that gender-based differences exist or by failing to acknowledge the need for corrective interventions [1].

In addition to the paucity of data on barriers and delays at the provider/system levels, our review revealed several other research gaps. To comprehensively identify gender related barriers and delays, study populations need to include persons with suspected TB who have not presented for care.

There is also an urgent need for more granular analyses of gender disparities in accessing TB services for each step along the diagnostic and treatment continuum (i.e., symptom onset to symptom recognition; symptom recognition to seeking care; seeking care to TB diagnosis; TB diagnosis to notification; and notification to treatment initiation) at all levels. More generally, prospectively designed gender analyses are needed, and standardized ethnographic

and cultural epidemiologic tools [5] also need to be used prospectively to systematically collect and compare gender-related sociocultural variables across studies, which may help to identify common as well as unique gender-related barriers.

The studies included in our review span different continents and differ among degree of urbanization and type of study population. Therefore, it is important to recognize heterogeneity while summarizing our findings. While most of the included studies were conducted in the Africa, South East Asia, and West Pacific regions, the frequency of some reported barriers by gender was not always proportional to numbers of studies from these regions. For example, financial barriers and delays at the individual and provider/system levels were reported proportionally by region, regardless of gender. However, women in South East Asia were noted to face more stigma, and women in West Pacific and both men and women in South East Asia had lower health literacy than persons from Africa (see Supplementary Table S4). These findings implicate region-specific priorities in interventions to improve access to TB care. Regarding study population type, included studies that assessed the general population (one quarter of the included studies) almost exclusively reported on stigma and health literacy barriers. Compared to studies among persons with diagnosed or suspected TB that found gender disparities, studies that assessed the general population were less likely to report that women face greater stigma and more likely to report that women have lower health literacy than men (see Supplementary Table S5). There is very little data to assess barriers and delays in different degrees of urbanization, as high percentage of studies were conducted in mixed urban and rural setting. However, studies from rural areas more frequently reported on worse health literacy among women (see Supplementary Table S6). The implication was already discussed above.

Many have called for more research on gender-related disparities in TB [4, 5, 8, 172, 173]. Accordingly, our systematic review aimed to assess the quantitative gender-related differences in barriers and delays that limit access to TB diagnostic and treatment services, which have been recognized as important for optimal TB control. However, a number of biases may have impacted our results and the individual studies that were included in our review. Although we strove to capture all high-quality studies addressing the topic of this review, some studies may have been missed, particularly those that were not published because they failed to document gender-related differences in accessing TB services, which may have resulted in an over representation of studies that demonstrated a difference (i.e., publication bias). In addition, our review was subject to biases introduced by the exclusion of non-English articles as studies from countries where English is not a primary language, particularly Latin American countries or East Asia, may be under represented. A noted limitation of the included studies was that the majority was cross-sectional studies and assessed patients with a confirmed TB diagnosis and/or those presenting for TB care. Those experiencing the greatest barriers to TB services are also least likely to be diagnosed with TB. Because persons presenting for care have already surmounted many individual level barriers, comparisons of gender-related differences in these study populations will suffer from selection bias. In addition, sample size among the included studies was highly variable, and the quality of study reporting was generally poor. Finally, the summary measures and definitions of barriers and delays were inconsistently used, making it difficult to weigh the relative importance of findings from the included studies or to conduct a meta-analysis or stratified analysis.

V. Conclusions

Overall, the scientific community is recognizing that gender related differences in health may be greater than is known and is increasingly prioritizing the need for routine gender related analyses [174–177]. Notably, the WHO has developed a strategy to mainstream the analysis of the role of gender in health and to monitor and address systemic gender related health inequities [178]. In the context of TB, gender analyses are critical to inform interventions to optimize the global impact of TB services. Our systematic review indicated that, when gender-related differences were found, women experienced greater barriers and longer delays than men and identified several gender-specific components within individual-level financial, stigma, and health literacy barriers that are amenable to intervention. However, our review also revealed research gaps and clearly highlighted that well designed gender analyses are critical. Finally, qualitative accounts of the gender differences presented here would inform mechanisms of barriers and provide insight for interventions.

Conflict of Interests

The authors declare that there is no conflict of interests regarding the publication of this paper.

Authors' Contribution

Wei-Teng Yang, Celine R. Gounder, and Katherine N. McIntire wrote the manuscript and analyzed data. Wei-Teng Yang, Tokunbo Akande, and Jan-Walter De Neve abstracted data and made supplementary tables. Amita Gupta and Celine R. Gounder wrote the grant for funding from the World Health Organization. Aditya Chandrasekhar, Alan de Lima Pereira, Naveen Gummadi, and Santanu Samanta were involved in the title and abstract screening. All authors commented on and approved the paper.

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Obesity and its Relation to Coronary Artery Disease (CAD) Incidence

By Lt Col Md Fakhrul Alam, Dr. Israt Jahan, Dr. Md. Ataul Hoque,
Capt Swapnil Kumar Roy & Dr. Atia Sharmin Bonna

Abstract- *Background:* Cardiovascular disease (CAD) has become a global health issue. If you have acute coronary syndrome, you run the risk of dying or being disabled while still in your prime.

Objective: The primary goal of this study is to assess the obesity effect and its relation to coronary artery disease (CAD).

Method: These data were collected in a cross-sectional research done at a private hospital in the period of January 2019 to January 2020, and all data was recorded systematically in a pre-formed data sheet and analysed using applicable statistical techniques.

Result: In the study male patients were 30% higher than female. Dyslipidaemia and obesity were very much common in 74%, 79% patients. Out of 150 patients 54% male and 46% female belongs to obese group.

Conclusion: Individuals with obesity are more likely to develop heart disease in Bangladesh, based on the data we have. According to recent research, the incidence of obesity in cardiovascular illnesses may be higher than previously thought.

Keywords: *coronary artery disease (CAD), obesity, high blood pressure.*

GJMR-F Classification: *NLMC Code: WG 300*

Strictly as per the compliance and regulations of:

Obesity and its Relation to Coronary Artery Disease (CAD) Incidence

Lt Col Md Fakhrul Alam [α], Dr. Israt Jahan [σ], Dr. Md. Ataul Hoque [ρ], Capt Swapnil Kumar Roy [ω], & Dr. Atia Sharmin Bonna [¥]

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Result: In the study male patients were 30% higher than female. Dyslipidaemia and obesity were very much common in 74%, 79% patients. Out of 150 patients 54% male and 46% female belongs to obese group.

Conclusion: Individuals with obesity are more likely to develop heart disease in Bangladesh, based on the data we have. According to recent research, the incidence of obesity in cardiovascular illnesses may be higher than previously thought.

Keywords: coronary artery disease (CAD), obesity, high blood pressure.

I. Introduction

Cardiovascular disease (CAD) is caused by cholesterol plaque development in the heart's arteries, which is increased by obesity. There are numerous other risk factors for coronary heart disease (CAD) that are associated with obesity. Cardiovascular disease is more common in those who are obese in the abdominal area (central obesity or "visceral obesity"). [1-3]

It has been estimated that between 12 and 16 percent of Indians are affected with coronary artery disease (CAD). Five-fifths (52 percent) of all CVD-related fatalities occur among persons under the age of 50, and about a quarter of all acute myocardial infarctions (MI) occur in those under the age of 40 in India as well 4 Patients who seek medical attention owing to symptomatic sickness may represent the "tip of the iceberg" when combining visible and subclinical disease. Due to the fact that asymptomatic individuals seldom seek medical attention, the real prevalence of CAD has been grossly underestimated since childhood.[4]

Heart failure is a risk factor even in those without coronary artery disease. The exact process by which obesity causes heart failure without coronary artery disease is uncertain, although two major ideas exist.[5]

Firstly, fat people have more blood in their bodies, which makes the heart work harder and can lead to heart failure in the long run. ventricular hypertrophy is a condition in which the heart's muscle size increases as it works harder. Obesity has also been related to sleep apnea, which can lead to respiratory problems and high blood pressure in the long term. [6]

The major objective of this study is to examine the obesity impact and its link to coronary artery disease (CAD).

II. Objective

a) General objective

- To evaluate the obesity effect and its relationship to CAD.

b) Specific objective

- To detect risk factor of CAD.
- To estimate incidence of systolic and diastolic hypertension of all study patients.

III. Methodology

a) Study type

➢ This was a cross sectional study.

b) Study place and period

➢ This study was conducted from January 2019 to January 2020 at different private hospital.

c) Method

150 rural and urban individuals with 21 to 70 years of age and both genders were randomly chosen for a cross-sectional research. Participants under the age of 20, pregnant women and those taking medication were excluded from the study. The study's goals were explained to the eligible participants. Participants were asked to visit a local health care facility after obtaining informed permission. Participant's physical activity, family history of hypertension or

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diabetes and smoking were all gathered using a WHO-STEPS modified methodology.

d) Statistical Analysis

- A pre-formatted data sheet was used to capture all data, and the data was then analyzed using applicable statistical techniques using Microsoft Windows software version 20. Simple percentages were used to assess the prevalence of hypertension. t-tests and chi-square tests were used to determine the significance of the results. At a threshold of 95 percent (p =0.05), all statistical tests were judged significant.

IV. Result

In table-1 shows age distribution of the patients where for both male and female, most of the patients belongs to (41-50) age group, 57%. The following figure is given below in detail:

Table-1: Age distribution of the patients

Age group	%
21-30	6%
31-40	8%
41-50	57%
51-60	20
61-70	9%

In figure-2 shows gender distribution of the patients. Where among 150 patents male patients were 30% higher than female. The following figure is given below in detail:

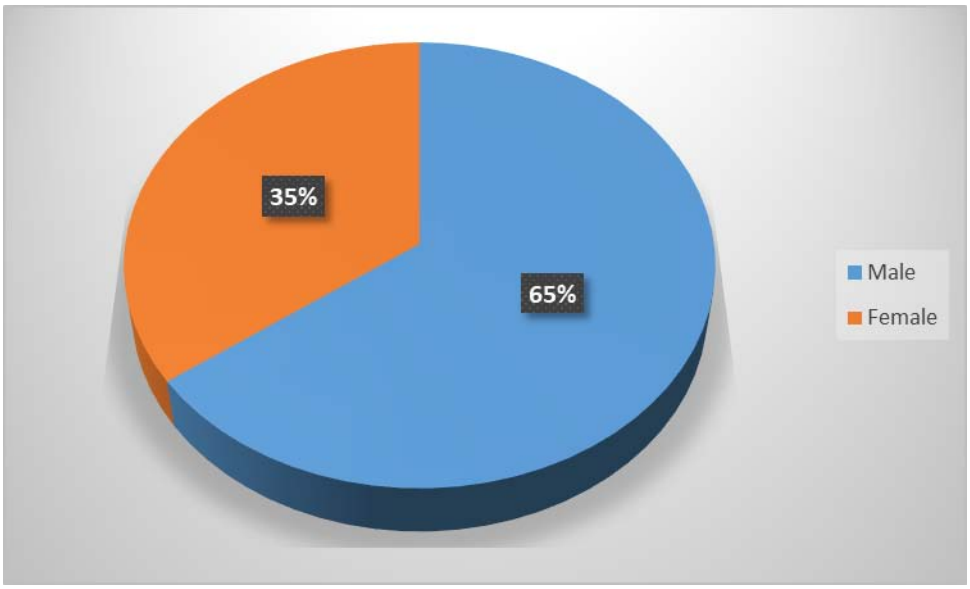

Figure-2: Gender distribution of the patients

In figure-3 shows the percentage of obesity in the patients where, out of 150 patients 54% male and 46% female belongs to obese group. The following figure is given below in detail:

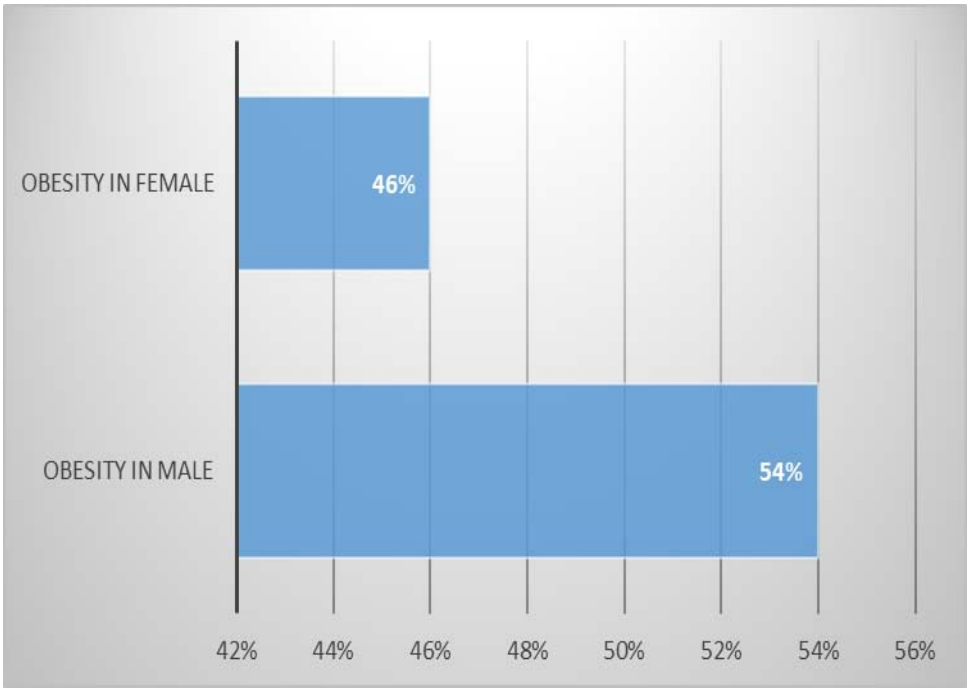

Figure-3: The percentage of obesity in the patients

In table-2 shows the incidence of systolic and diastolic hypertension of all study patients, where among total 150 patients, systolic hypertension was 24% whereas diastolic hypertension 28%. The following table is given below in detail:

Table-2: The incidence of systolic and diastolic hypertension of all study patients

Group	%
Systolic hypertension	24%
Non systolic hypertension	76%
Total	100%
Diastolic hypertension	28%.
Non diastolic hypertension	72%
Total	100%

In figure-4 shows distribution of patients according their living place where 52% people lived in rural area where as 48% people in urban area. The following figure is given below in detail:

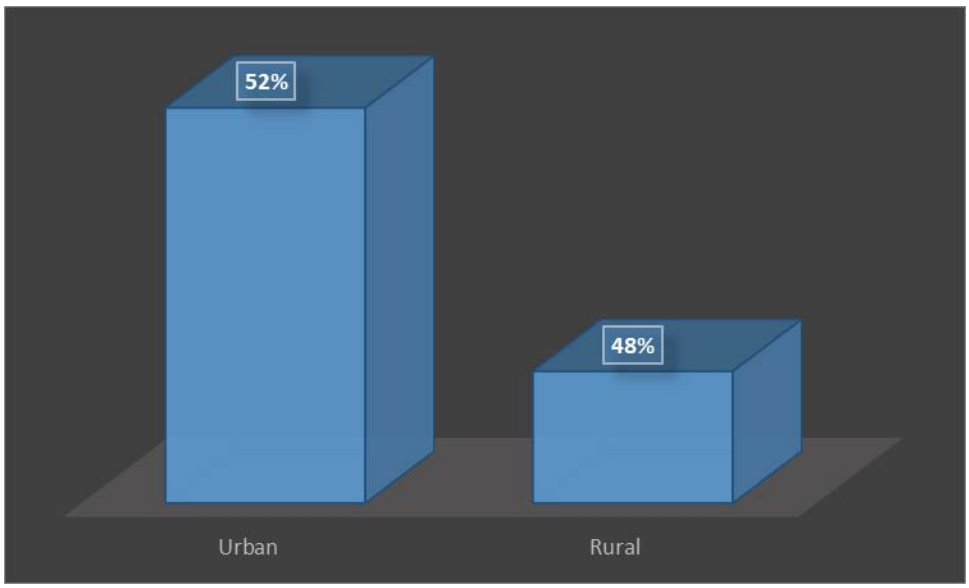

Figure-4: Distribution of patients according their living area

Table-2 shows risk factor analysis of the patients where dyslipidaemia and obesity were very much common in 74%, 79% patients. The following table is given below in details:

Table-2: Distribution of risk factors for CHD in patients (n = 150)

Risk Factors	(n = 150)
	%
Smoking	52%
Hypertension	63.5%
Dyslipidaemia	74%
Obesity	79%
DM	30%
Family history	26%
Sedentary life style	19%

In figure-5 shows angiographic pattern of study population where majority cases belong to single vessel coronary artery disease (SVCAD) group, 50%. The following figure is given below in detail:

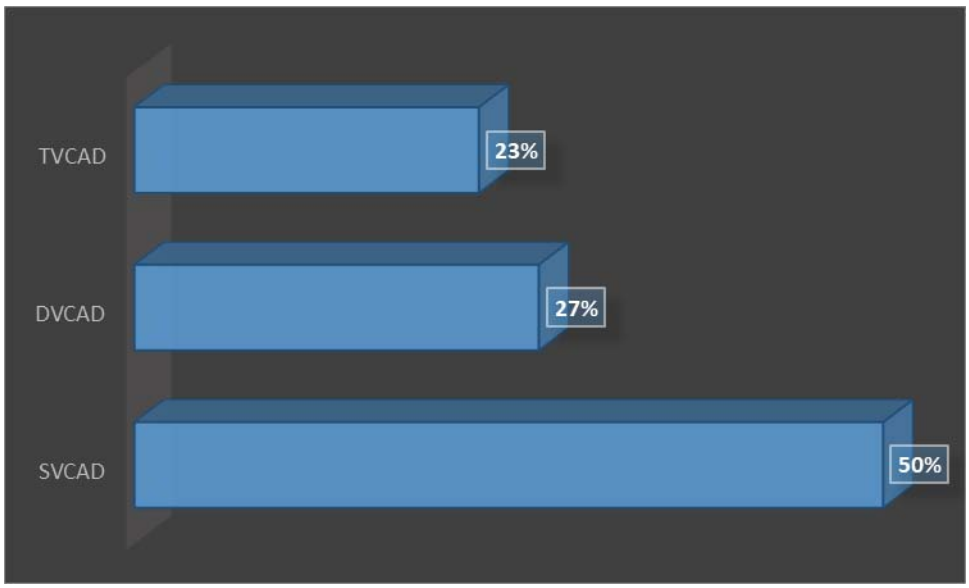

Figure-5: Angiographic pattern of study population

In table-3 shows Correlation of obesity with family history, smoking, occupation, physical activity, annual income, hypertension, BMI, Gender, heart diseases and age in patients where we found that mostly age and heart diseases strongly correlated with obesity than other variable. The following table is given below in detail:

Table-3: Correlation of obesity with family history, smoking, occupation, physical activity, annual income, hypertension, BMI, Gender, heart diseases and age in patients

CORRELATION OF OBESITY WITH	R-VALUE	P-VALUE
FAMILY HISTORY	-.229	<0.01
SMOKING	-.124	<0.01
INCOME	-.130	<0.01
OCCUPATION	.008	>0.05
PHYSICAL ACTIVITY	-.142	<0.01
HYPERTENSION	-.289	<0.01
BMI	.276	<0.01
GENDER	-.022	>0.05
AGE	-.285	<0.01
HEART DISEASES	-.286	<0.01

V. Discussion

This cross-sectional study was designed to determine the incidence of cardiac disease in obese Bangladeshi adults who were overweight or obese. As a major risk factor for cardiovascular disease (CVD) or heart disease, obesity must be addressed.

All research subjects had their blood pressure measured, and we found that the blood pressure of the obese group was statistically significantly greater than that of the normal weight group. Obesity was more prevalent in this study than in the previous one, as we found out during our research process. [6]

Overweight and obesity are significant problems in Bangladesh and other developing countries.

The prevalence of obesity is expected to be higher in older populations than in younger populations, such as Bangladesh and India, although studies have shown that hypertension is common in developing nations [7,8.]

As people age, they are more likely to become fat, which is in line with previous studies. [9]

According to this survey, 54 percent of males and 46 percent of females are obese. There was no statistically significant difference between males and females despite the greater incidence rate. People with heart disease are more likely to have obesity-related hypertension. Another study done in India's rural areas came to the same conclusion. When we looked at patients with positive cardiac illness, we found a significant prevalence of obesity.

Our research revealed that systolic and diastolic hypertension affected 24 and 28 percent of the 100 individuals, respectively. On the other hand, one research revealed that individuals with MI had a larger impact from elevated systolic blood pressure than from elevated diastolic blood pressure Endothelial damage induced by high systolic blood pressure might be the reason, leading to increased atherosclerosis. It has long been recognized that high levels of triglycerides, total cholesterol, and LDL cholesterol in the blood are associated with cardiovascular disease.

Similarly, obesity and salt consumption were linked in another research along with age, body mass index (BMI), physical inactivity (including smoking), and a family history of stroke/CVD. [5] The growing salinization of freshwater puts more than 35 million people in coastal Bangladesh at danger; increased salinity in drinking water has been related to higher blood pressure among youthful coastal populations. Since the majority of patients were from rural regions, they may not be aware of the hazards of drinking water salinity, which is why we found a high correlation with this report during the research.

Many individuals assume that cooking renders the salt safe. Weight gain, a recognized risk factor for coronary atherosclerosis (CAD), is considered to be made worse with an excessive salt intake.[10]

VI. Conclusion

We can draw the conclusion that obese individuals in Bangladesh have a higher risk of developing heart disease than other patients. In order to establish the prevalence of obesity in heart illness, more study is needed.

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Role of Nd: YAG Laser in Visual Outcomes and IOP Changes Pre and Post Nd: YAG Laser Capsulotomy

By Krishna Kant Gupta, Nitin Tulsyan & Govind Gurung

Abstract- *Background:* Posterior capsular opacification (PCO, secondary cataract, after cataract) is a post-surgical complication following cataract surgery. PCO results from the migration and proliferation of residual lens epithelial cells onto the central posterior capsule, leading to decreased visual function. Neodymium Yttrium Aluminium Garnet (Nd: YAG) LASER (light amplification by stimulated emission of radiation) Capsulotomy is one of the most common procedures for PCO following cataract surgery due to its non-invasive nature, immediate recovery and is an OPD procedure.

Objective: To observe the role of Nd: YAG laser capsulotomy in terms of visual outcome (Best Corrected Visual Acuity) and the changes in IOP and other complications after the procedure.

Material and Methods: A hospital-based, observational, prospective study was carried out at R. M. Kedia Eye Hospital from July 2018 to June 2019. 200 eyes of 200 patients with PCO were included in the study. Complete ocular examination including visual acuity (VA), anterior and posterior segment examination with a slit lamp, and IOP measurement using Goldmann applanation tonometer were performed pre and post-laser in all cases.

Keywords: *Nd: YAG laser, posterior capsular opacification, visual acuity, intraocular pressure.*

GJMR-F Classification: *NLMC Code: WW 290*

Strictly as per the compliance and regulations of:

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Results: Out of 200 subjects 108 were male and 92 were female. The average time interval of cataract surgery and Nd: YAG laser capsulotomy was 25-36 months. The maximum number of patients developing pco was under the age group of 51-60 years with a mean age of 55 ±5.52years. After performing Nd-YAG laser capsulotomy, 56% of patients had better VA ranging from 6/36-6/18, and 28% had improved VA between 6/12-6/6. The percentage of patients with better VA increased gradually during the follow-up period at one hour, one week, and one month. In our study, only 4 cases showed IOP of more than 21 mm Hg, IOL pitting in 40 and iris bleeding, and uveitis in 2 patient's each.

Conclusion: Nd: YAG Laser is a non-invasive, immediate recovery and OPD-based procedure that provides excellent posterior capsulotomies with minimal complications. From the study, it is clear that Nd: YAG laser posterior capsulotomy is safe and an effective method for treating capsular opening compared to invasive surgical procedures with excellent patient satisfaction.

Keywords: Nd: YAG laser, posterior capsular opacification, visual acuity, intraocular pressure.

I. Introduction

A cataract is opacification of the crystalline lens and its capsule. It is due to the loss of transparency of the lens because of abnormality of lens fibres.[1] It is the most common cause of visual impairment in the world following cataract surgery. Nepal Blindness Survey (1981) has identified cataracts and their sequels responsible for 72% of all blindness.[2] Posterior Capsular Opacification (PCO) is the most common late post-operative consequence of cataract surgery. PCO results from migration and proliferation of residual lens epithelial cells (LECs) onto the central posterior capsule, leading to a decrease in visual function.[3] PCO is a significant factor for ocular morbidity and is the key cause of decreased vision after cataract surgery.[4]PCO results from migration and proliferation of residual lens epithelial cells onto the central posterior capsule, leading to a decreased visual function.[5] Patients who have PCO with significantly reduced visual acuity (VA) need opening up of the posterior capsule to improve their vision. The ways for posterior capsulotomy are Neodymium Yttrium Aluminium Garnet (Nd: YAG), LASER (light amplification by stimulated emission of radiation), Capsulotomy and Surgical Capsulotomy.[6] Currently Nd: YAG laser capsulotomy is the standard and one of the most common procedures with a success rate of more than 95% for PCO following cataract surgery due to its non-invasive nature, immediate recovery and it being an OPD procedure.[7]

Laser capsulotomy uses a quick-pulsed Nd: YAG laser to apply a series of focal ablations in the posterior capsule and create a small circular opening in the visual axis.[8] Although safe and effective, the reported complications of Nd: YAG laser posterior capsulotomy include retinal detachment,[9-11] cystoid macular edema (CME),[11-12] and rise in IOP.[13-14] The decreased rate of

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complications and faster recovery has made Nd: YAG laser capsulotomy a popular approach for the treatment of PCO.[15] Some authors consider the increased risk of complication to be as a result of opening the capsule and not a specific problem of the laser procedure itself.[15-17]

Nd: YAG laser posterior capsulotomy is frequently carried out in our hospital, but no work has been done on the subject yet in our region. This study has been designed to determine the visual outcome and the changes in IOP and other YAG laser-related complications in patients with PCO.

II. Material and Methods

This hospital-based, observational, prospective study was conducted at the outpatient department of R.M.Kedia Eye Hospital from July 2018 to June 2019. A written informed consent was taken from the patients before the intervention. Patients above the age of 40 years were selected. 200Pseudophakic eyes having decreased vision due to capsular opacity were taken. The VA was taken, and all patients were examined on the slit lamp for IOP, and fundus examination was done to exclude the other causes for reduced vision and raised IOP before laser capsulotomy.

a) Inclusion criteria

1. All the patients with PCO with VA <6/18
2. Patients above 40 years of age having PCO

b) Exclusion criteria

1. Patient with associated corneal scar, irregularities, or edema that interferes with central visualization
2. Patient with increased IOP > 21 mmHg (measured by Goldmann applanation tonometer)
3. Patient with decentralised posterior chamber IOL
4. Patient with a known case of glaucoma, ocular hypertension, amblyopia, optic atrophy, and uveal, macular or retinal pathology
5. Any history of ocular surgery besides cataract surgery.

After enrollment in the study, detailed ocular examinations including visual acuity (VA) using standard Snellen's visual acuity chart, slit lamp examination, IOP by Goldmann applanation tonometer, direct and indirect ophthalmoscopy, B-scan Ultrasonography in cases of dense PCO was carried out by the author's before YAG laser capsulotomy to control bias in the study. Patient's pupil was dilated using tropicamide 1% eye drop and prepared before the procedure. Patients were instructed regarding the process, and then comfortably seated on a stool in front of the laser slit lamp with chin on chin rest and forehead on forehead rest and headband applied, and were asked to fixate the red light with the other eye (non-operating). The energy levels was fed, usually starting with 1–2 MJ / pulse, and gradually increased tilla 3-4 mm of capsulotomy was made, with Q-switched Nd: YAG Laser after topical anesthesia. Capsulotomy was done by the same author using the same laser machine to control bias in the study, and was enlarged with different energy levels depending upon the clinical conditions. Visual acuity and IOP were noted after 1 hour. Detailed examination of the anterior and posterior segments was carried out with the help of a silt lamp. IOP was recorded at every visit after examining VA and near vision i.e. at one week, and one month intervals to determine the improvement in vision and IOP changes.

Posterior segment pathologies and postoperative complications were also excluded at every visit by dilating the pupil after recording VA, near vision, and IOP. Bias was controlled by strictly following exclusion criteria and by proper follow-up. Those patients whose IOP were increased just after one hour after capsulotomy was put on timolol 0.5% twice a day for seven days. On follow-ups the IOP and VA were examined on the seventh day with Goldman's tonometer. The data was noted in pre-formed proforma. All the analyses were done by Microsoft-office to generate graphs, tables, and data. Significance level was analysed by calculating the "p" value, and observations were taken as significant at a "p" value less than 0.05 ("p"<0.05).

III. Results

The age distribution of the 200 cases included in this study is presented in the following table.

Table 1: Age-wise distribution

Age Distribution		
Age (Years)	Cases	Percentage
40-50	16	8%
51-60	76	38%
61-70	60	30%
>70	48	24%
Total	200	100%

In this study, subjects ranging from 40 years to above 70 are inrolled. The age of the patients ranged from 51-78, minimum being 51 years and maximum at the age of 78 years who fulfilled the inclusion criteria and were ready to come for follow-up.

The maximum number of patients with PCO was found between 51- 60 years with a mean age of 55±5.52 years.

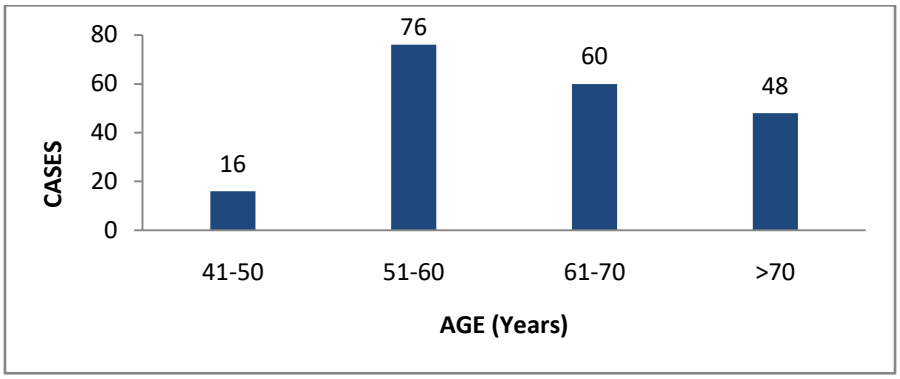

Fig. 1: Age wise distribution

Out of 200 patients, 108 (54%) were male, and 92 (46%) were females.

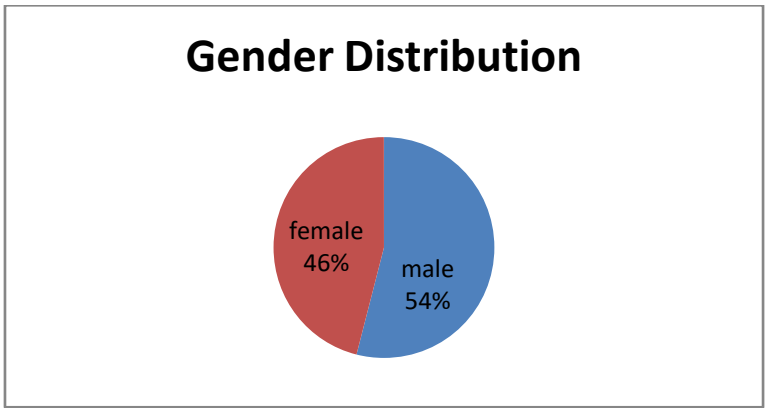

Fig. 2: Gender Distribution

84 (42%) patients who had PCO in the Right Eye, while 116 (58%) patients had PCO in the Left Eye after cataract surgery with posterior chamber intraocular lens implantation.

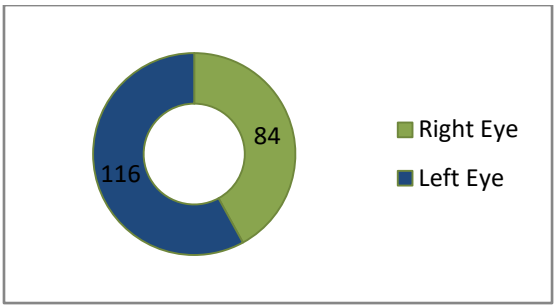

Fig. 3: Laterality

In this study period, we found that the maximum number of patients developed PCO after a period ranging from 25-36 months (i.e. 38%), followed by 37-48 months (i.e. 34%), 13-24 months (20%), 49-60 months (2%), and only one patient each developed PCO after 0-12 and >61 months respectively.

Table 2: Duration between Cataract surgery and Nd: YAG laser

Duration between cataract surgery and Nd: YAG laser capsulotomy		
Duration (months)	Cases	Percentage
0-12	4	2%
13-24	40	20%
25-36	76	38%
37-48	68	34%
49-60	8	4%
>61	4	2%
Total	200	100%

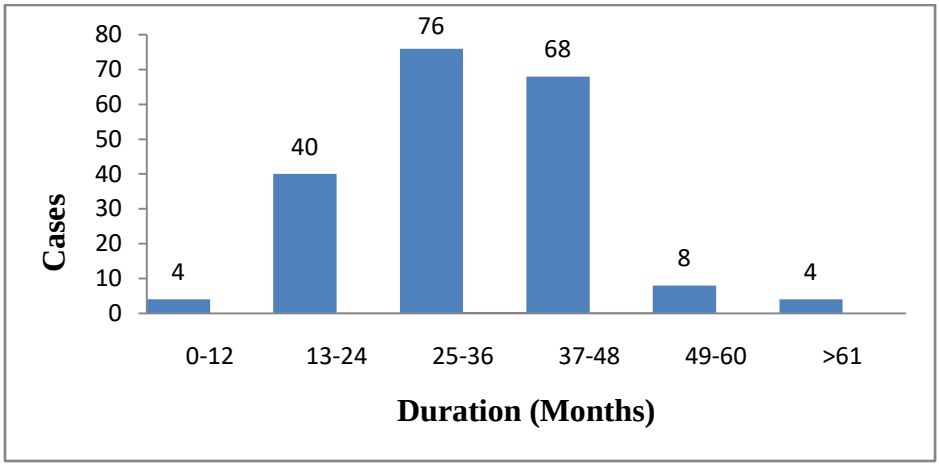

Fig. 4: Duration between Cataract surgery and Nd: YAG laser

The BCVA of all the patients included in this study was recorded pre-laser, post-laser, after one hour, one week, and one month as shown in the figures.

Table 3: Pre laser BCVA

Pre laser BCVA		
BCVA	Cases	Percentage
<3/60	20	10%
3/60-6/60	152	76%
6/36-6/18	28	14%
Total	200	100%

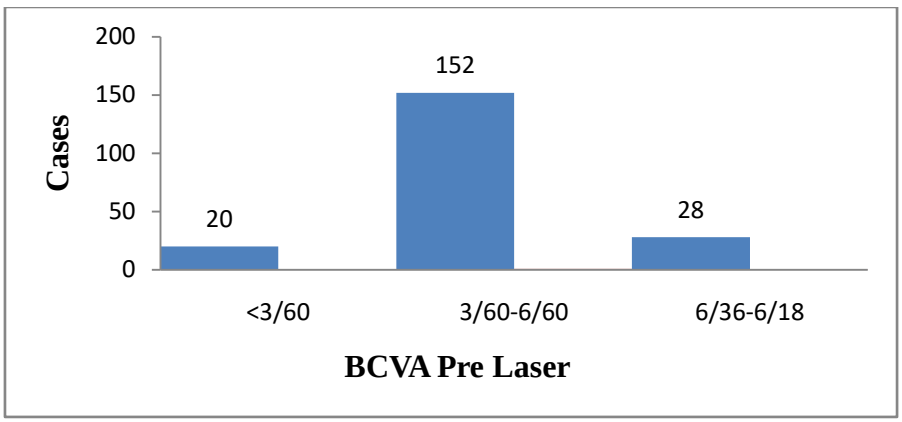

Fig. 5: Pre laser BCVA

Table 4: Post laser BCVA

Post laser BCVA			
BCVA	1 hour	1 week	1 month
<3/60	8	8	4
3/60-6/60	24	4	4
6/36-6/18	112	76	64
6/12-6/6	56	112	128

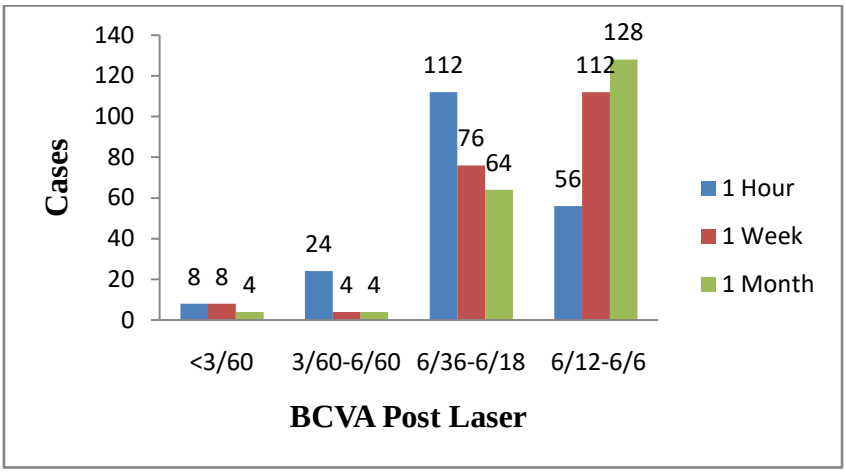

Fig. 5: Post laser BCVA

The IOP of all the patients was taken pre-laser, post-laser, after one hour, one week, and one month with the use of GAT, as shown in the respective tables and figures.

Table 4: IOP Measurement

IOP Measurement				
IOP (mm Hg)	Pre-laser	1 hour	1 week	1 month
5-10	20	12	20	24
11-15	108	96	108	108
16-20	72	88	72	68
>20		4		

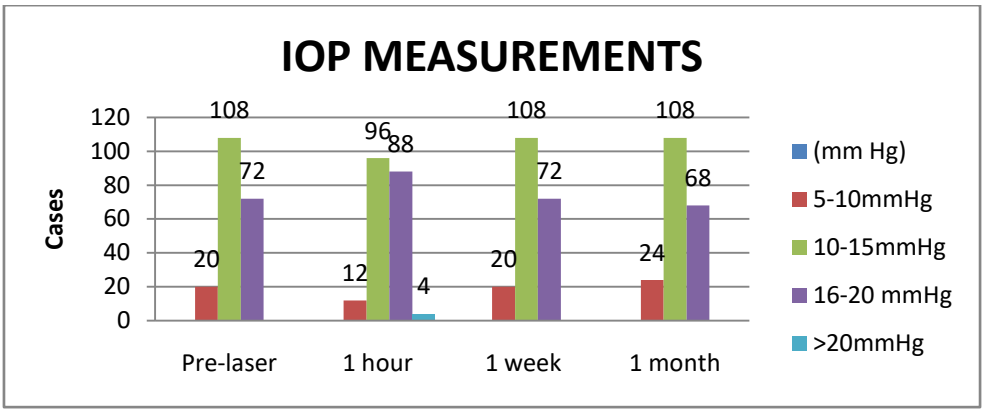

Fig. 5: IOP Measurement

In all cases, combination of steroid and antibiotic eye drop was given for a week to control the inflammatory changes, if any, following laser. About 30% of cases showed transient elevation of IOP, within a normal range of 20mm Hg, and only four patients showed raised IOP at 1-hour post-laser, which was managed with topical timolol 0.5% for one week along with topical steroid.

Following Nd: YAG laser capsulotomy, patients were examined for any complication post-laser besides elevation of IOP with the help of a slit-lamp examination. The following table and figure show the list of complications that were noticed post-Nd-YAG laser in this study.

Table 4: Complications post YAG laser

Complications	Cases	Percentage
IOP elevation	4	2%
Iris bleeding	4	2%
Pitting of IOL	40	20%
Uveitis	4	2%
CME	0	0%
RD	0	0%
Endophthalmitis	0	0%

Out of 200 patients treated with Nd-YAG laser capsulotomy, 56 patients developed complications which included IOP elevation seen in four patients (i.e. 2%), pitting of IOL in 40 patients (i.e. 20%), and iris bleeding and uveitis in four patients (i.e. 2%) each. These four patients' were managed with topical steroid and mydriatics in the successive follow-ups. In this study, no patient developed CME, RD and endophthalmitis.

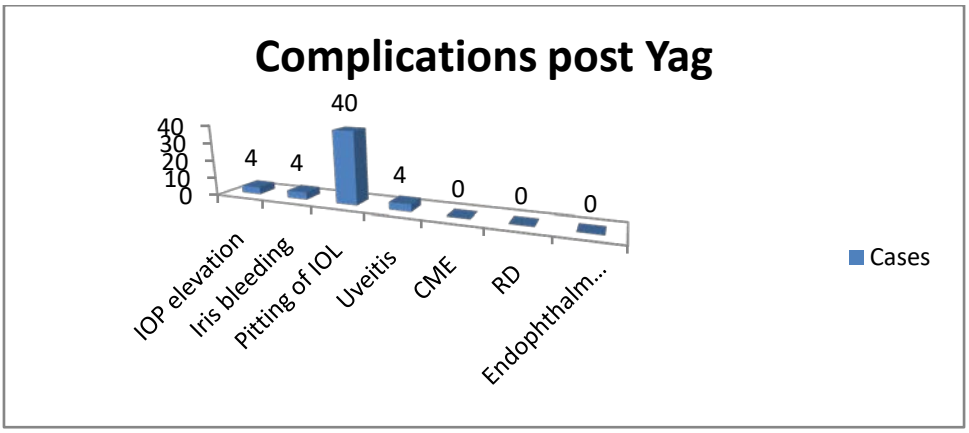

Fig. 6: Complications post YAG laser

IV. Discussion

200 patients having PCO after cataract surgery were evaluated in this study. 76 patients with PCO had been operated on our hospital, while 124 patients were operated on elsewhere. Gender distribution showed more males as compared to females having PCO comparable to other studies[18]because the males have more outdoor activity as compared to females, and in our context, males are the only sources of earning in the rural family. So, the overall concern for vision is more for males in our scenario.

In our study, the maximum number of cases having PCO was from the age group of 51-60 years (38%), which may be due to the inclusion criteria whose lower limit was more than 40 years and lack of follow-up by the older age patients which is in agreement with that of Soni P et al.[19], where the maximum patients also fell under the age group of 50-60 years (i.e. 52%).

Patel OV et al.[20] and Durham DG et al.[21] in their study showed the mean duration of development of PCO after cataract surgery was around two years and Bari KN[22] to be 23 months which correlates with our study where the mean duration for the development of PCO is 2.2 years (26 months).

Raised intraocular pressure (IOP) remains one of the frequent complications of Nd: YAG laser capsulotomy. It is usually acute but transient. In our study, 2% of subjects showed increased IOP of more than 21 mm Hg which returned to the average level within one week. However, transient elevation of IOP of 3-5 mm Hg from their basal level was noted in about 30% of subjects within 24 hours but not exceeding 20 mm Hg, which was similar to the study conducted by Nirankari et al.[23] where out of the 60 eyes, transient raise of IOP was prominent in 10 eyes.

Similarly, Channell et al.[13] in their study found transient rise in IOP in the first 24 hours in addition, Wasserman et al.[24] noted the average maximum induced IOP rise was 1.4 mmHg which occurred within 1 hour of the capsulotomy. Though the cause remained undetermined, the possible mechanisms would be, the

more the energy used during the procedure, the more particles liberated from posterior capsular breakdown, resulting in the clogging of the angle of the anterior chamber and leading to the raised IOP.

Lens pitting is most likely to occur when the lens and capsule are closely approximately. In our study, IOL pitting was seen in 40 out of 200 (20%) subjects. A similar study conducted by Shah GR et al.[25] IOL pitting after capsulotomy was observed in 12% cases. Similarly, Terry AC et al.[26] in their study reported IOL damage in 12 of 30 eyes with IOL implants, and Gardner[27] reported 39% of subjects with IOL damage. However, there was no harmful effect seen on the VA, and the patients were satisfied with their post-laser corrected vision with glasses in our study.

The documented visual improvement of the subjects in our study confirms the efficacy of Nd: YAG laser for the treatment of posterior capsulotomy. 96% of subjects showed significant visual acuity improvement. The statistical analysis between pre and post-visual acuity showed a 'p' value to be 0.02, which was statistically significant. At one week after capsulotomy, 56% of patients had the visual acuity of 6/12 to 6/6, and at one month, it was increased up to 64%. The vision of 2% of subjects was unsatisfactory by laser capsulotomy due to preexisting optic atrophy and retinal pigment epithelium atrophy. Our study coincides with Gardner KM et al.[27], who analyzed 100 cases of ND: YAG laser posterior capsulotomy and reported that at one week, 73% of entire population was in the 20/15 to 20/40 group, in contrast the vision of 5% of subjects was not improved by laser capsulotomy due to documented progression of preexisting retinal disease.

Iris bleeding was seen in 4 patients during YAG laser in preexisting posterior synechiae, which were not released by the dilating drops. Shah GR[25] reported 0.1% subjects of postoperative uveitis and Chambless WS et al.[28] in their study and found persistent anterior uveitis in 1.4% of the patients, which is in accordance with, where post-laser uveitis was reported in 4 patients at one week follow up and was managed with topical steroid and mydriatics, who improved on consecutive follow-ups.

In another comparable study carried out by Khanzada MA et al.[29] in 500 patients, 8.0% patients developed the complications due to YAG laser, which included IOL pitting in 5.40% eyes, raised IOP in 0.80%, vitreous in the anterior chamber in 0.40%, and cystoid macular edema (CME) in 0.20% patient's eyes. In contrast, none of the patient developed sight threatening complications like cystoid macular edema, retinal detachment, macular hole, or endophthalmitis in our study. Based on our study, it is evident that the Nd: Yag laser is a very effective, cheap, and easy mode of treatment for PCO with minimal post-laser complications.

V. Conclusion

Though various methods are available to treat PCO, Nd: YAG laser capsulotomy remains the most common and safe procedure. It is very economical, convenient, fast, and a non-invasive OPD procedure with immediate results. Although non-invasive and generally considered safer, it carries a low but finite risk of complications. These complications are rare and rarely sight-threatening. The Nd: YAG laser is established to provide immediate excellent visual outcomes post YAG laser.

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Is it Possible to Cure Cancer Permanently?

By Joel Morris

Cancer- Amysterious and severe disease, has also become a leading cause of death worldwide. It accounted for around one crore deaths in 2020. Medical sciences worldwide are still trying to figure out the permanent cure and exact cause of the disease. From an Ayurvedic perspective, the management and prevention of the disease are highly effective. Ayurveda takes an integrated approach to treat cancer patients and minimize the spread and growth of cancer cells. To know how, please read this blog.

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Is it Possible to Cure Cancer Permanently?

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I. Cancer

A mysterious and severe disease, has also become a leading cause of death worldwide. It accounted for around one crore deaths in 2020. Medical sciences worldwide are still trying to figure out the permanent cure and exact cause of the disease. From an Ayurvedic perspective, the management and prevention of the disease are highly effective. Ayurveda takes an integrated approach to treat cancer patients and minimize the spread and growth of cancer cells. To know how, please read this blog.

II. Ayurveda and Cancer

In simple terms, cancer is described as the multiplication of the cells abnormally. During the normal cell multiplication process, the cells stop growing when they infringe on nearby tissues. This is not the case with cancerous cells. They start to grow abnormally and grow in large numbers creating a tumor. When these cells move to other parts of the body, they cause a secondary tumor known as a malignant tumor or reach the metastasis stage, where cancer cells enter the bloodstream.

In ancient Ayurvedic texts, various terms have been mentioned defining cancer, e.g., *granthi* (benign tumor), referring to the initial stage of cancer, if not treated properly, can turn into *arbuda* (malignant tumor) and *adhyarbuda* (recurrence of the disease). Specifically, there is also the term '*karkatarbuda*', which means a tumor that grows like a scorpion in different directions.

In the Ayurvedic perspective, the doctors always try to identify which dosha is out of balance, causing an imbalance or disease in the body. Cancer is considered a tridoshic disease that means all three doshas - Vata, Pitta, and Kapha are involved in this disease. Besides, rasa dhatu and rakta dhatu are primarily involved in carrying the infected cells, which are involved in causing cancer from one place in the body to another.

a) Factors that lead to cancer as per Ayurveda

Modern science has found out different causes for cancer - faulty DNA and genes are responsible for the abnormal growth of cells. But why the DNA behaves abnormally is still a mystery to be solved or identified. According to Ayurveda, a person with insufficient Prana (life energy), Ojas (immunity), and Tejas are more susceptible to cancer. Toxins or chemical deposition in the body causes imbalance and disease in the body. Toxins formation and deposit lead to cancer, not only at the physical level but also at the mental level.

b) Ayurvedic treatment for cancer

If cancer is not detected in the early stage, it becomes very difficult to treat it. It has been observed that when people come to know about cancer, it is already at an advanced stage. However, with an integrated approach, it is possible to treat cancer or minimize the spread and growth of cancerous cells.

The Ayurvedic approach towards cancer is twofold –

a) *Shodhana*– Through this treatment process, the Ayurvedic doctor focuses on strotas shuddhi-cleansing of the body channels through various techniques and medicines

b) *Ojas building*– The focus remains on increasing the Ojas, which is enhancing the immunity of the person affected by cancer

In Ayurvedic treatment for cancer, shodhana cleans toxins (ama) and all those factors responsible for blocking the strotas (channel). At the same time, Ojas building helps enhance the immunity levels both at the physical and mental levels of the person. Through this treatment approach, Ayurveda works effectively on limiting the growth of cancer cells.

Along with Ayurveda, other treatment methods including modern medicines, naturopathy and cleansing (detoxification) methods, meditation, breathing exercises (pranayama), and yoga are used to suppress or alleviate the symptoms. This integrative treatment approach is taken to stop/ suppress the growth of cancer cells in the body and increase immunity so that the person responds well to the medication and treatment. With increased immunity power, the patient's body can overtake the growing cancerous cells. Otherwise, the cancerous cells can further decrease the immunity levels of the patient.

Ayurvedic treatment for cancer can also be taken by the patients who underwent radiation therapy/chemotherapy to deal with its side effects like tiredness, sore mouth, loss of appetite, feeling and being sick, anemia, sleep issues, emotional problems. Interestingly, Ayurveda has a separate branch of rejuvenation (Rasayana) that helps increase the Ojas of the patient. Ayurvedic medicine for cancer also helps improve the overall quality of life, healthy lifestyle practices, panchakarma therapies, and psychological counseling sessions.

Author: e-mail: seo@liqvd.asia

Once diagnosed with cancer, getting a permanent cure is difficult, painful, time-consuming, and expensive. Therefore, we can shift our focus on preventing ourselves from getting exposed to this deadly disease as much as possible by practicing the Ayurvedic lifestyle – following dincharya-ke-niyam as per Ayurveda for healthy and balanced living. It will not only help keep our body healthy but also relaxes our mind. You can consult Jiva Ayurveda specialists to know more about Ayurveda for cancer, its prevention plan, and treatment. They will provide you with a detailed guideline that is personalized for you as per your Prakriti.

c) *Few simple tips that can be followed for healthy living*-

- Switch on to an alkaline diet. Acidic foods trigger the growth of cancerous cells.
- Detox and nourish your mind and body with panchakarma therapies.
- Focus on increasing your immunity (Ojas) levels.
- Don't suppress the natural urges like urine, burp, flatus, feces, sneeze, and yawn.
- Reduce mental stress by practicing breathing exercises, yoga, and meditation.

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

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

Manuscript Style Instruction (Optional)

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

Structure and Format of Manuscript

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

A research paper must include:

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

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

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

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

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

Format Structure

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

All manuscripts submitted to Global Journals should include:

Title

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

Author details

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

Abstract

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

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

Keywords

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

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

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

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

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

Numerical Methods

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

Abbreviations

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

Formulas and equations

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

Tables, Figures, and Figure Legends

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

Figures

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

Preparation of Eletronic Figures for Publication

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

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

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

Tips for writing a good quality Medical Research Paper

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Informal Guidelines of Research Paper Writing

Key points to remember:

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

Final points:

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

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

The discussion section:

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

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

General style:

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

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

Mistakes to avoid:

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

Title page:

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

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

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

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

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

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

Approach:

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

Introduction:

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

The following approach can create a valuable beginning:

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

Approach:

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

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

Procedures (methods and materials):

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

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

Materials:

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

Methods:

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

Approach:

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

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

What to keep away from:

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

Results:

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

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

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

Content:

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

What to stay away from:

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

Approach:

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

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

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

Figures and tables:

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

Discussion:

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

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

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

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

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

Approach:

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

Describe generally acknowledged facts and main beliefs in present tense.

The Administration Rules

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

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

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

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

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

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

Topics	Grades		
	A-B	**C-D**	**E-F**
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

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