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Editorial

STRESS AND MENTAL FATIGUE IN THE MEDICAL PROFESSION

Dr. Balwinder Kaur Rekhi

The medical profession is often regarded as one of the most rewarding and respected careers, but it is also among the most stressful. Healthcare professionals, including doctors, nurses, paramedics, and medical technicians, are tasked with the immense responsibility of saving lives, making critical decisions, and providing care under high-pressure conditions. Unfortunately, the demands of the profession frequently result in significant stress and mental fatigue, which, if left unaddressed, can severely impact both the health of the individuals in these roles and the quality of patient care.[1] The word "stress" is derived from the Latin term meaning "closer". However, it wasn't until the 18th century that the term evolved to capture the feelings of weariness, suffering, and the far-reaching effects of a challenging life.[2] Many scholars describe stress as a "general adaptation syndrome, " which unfolds in three distinct phases: the alarm, resistance, and exhaustion.[3]

Stress-generating factors - Stress in the medical profession stems from various factors, making it a particularly demanding field. Long working hours, often involving extended shifts, nights, and weekends, lead to exhaustion and burnout, leaving little time for personal life or relaxation.[4] The high workload, with the need to manage numerous patients and meet tight deadlines, compounds this pressure. Additionally, the emotional toll of dealing with life-and-death situations, patient suffering, and trauma can be mentally and emotionally exhausting. Furthermore, the administrative burden-such as documentation, compliance, and other non-medical tasks-detracts from time spent with patients, increasing stress.

Diseases that affect health professionals- Health professionals face a range of health risks due to the demands of their work. These include mental health issues like burnout, anxiety, and PTSD, as well as musculoskeletal problems from physical tasks. They are also at higher risk of infectious diseases, such as respiratory infections and bloodborne illnesses. Cardiovascular diseases, gastrointestinal issues, and sleep disorders are common, often linked to stress and irregular schedules. Lastly, substance use disorders can affect some health professionals, as the stress and emotional strain of their work may lead to alcohol or drug misuse.[5]

Burnout Syndrome - Burnout syndrome is a significant concern in the healthcare profession, characterized by physical, emotional, and mental exhaustion caused by prolonged stress. The main symptoms of burnout include chronic fatigue, emotional exhaustion, feelings of reduced accomplishment, and depersonalization, where professionals become detached or indifferent to their patients' needs. Burnout not only affects the well-being of healthcare workers but can also impact the quality of patient care, leading to errors, reduced compassion, and lower overall job satisfaction. Addressing burnout requires systemic changes, including adequate staffing, mental health support, work-life balance, and creating a supportive work environment to help healthcare professionals manage stress and maintain their health.[6]

Coping Strategies - To address this crisis, a series of actions is recommended: eliminating strictly timed, brief patient visits; immediately assembling and fully supporting medical teams; and offering biweekly or monthly Balint groups where healthcare practitioners can discuss challenging clinician-patient relationships in a supportive, empathetic setting. Additionally, front-line clinicians should be allocated time for web-based or in-person stress management and resilience training programs. Encouraging mindful movement and practices like "laying on of hands" can also be beneficial, such as offering paid time for mindful exercise, physical therapy for moderate to severe pain, or massage, in line with the emerging concept of interoception. Healthcare practitioners are invaluable, and it is crucial that we prioritize their health and well-being just as we do that of our patients.[7]

Original Research Article

A STUDY TO EVALUATE CAUSES AND RISK FACTORS OF STILL BIRTHS IN A TERTIARY CARE HOSPITAL

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INTRODUCTION

Due to the high prevalence of morbidity, impairment, and stunted growth at birth, which has far-reaching consequences for individuals and society as a whole, a good start to life is essential. The gift of life is the birth of a healthy baby, whereas the tragedy of death is the birth of a dead infant. The tragic loss of life that accompanies each stillbirth is deep and lasting. One of the most difficult tragedies that an attending obstetrician encounter is the occurrence of foetal death.

Regardless of gestational age, foetal death is defined according to the International Classification of Diseases, 10th Revision, as any death that occurs before the foetus is completely expelled from its mother.[1] The World Health Organisation, however, considers a stillbirth to have occurred if the infant does not show any signs of life beyond 28 weeks of gestation or if the newborn's weight is more than 1000 gm when the gestational age is absent.

A significant factor in perinatal mortality is the number of stillbirths. The aetiology of stillbirths should be better understood in order to decrease perinatal mortality, which in turn necessitates a decrease in stillbirths. Even in nations with ready access to autopsy and placental pathology, approximately half of all stillbirths remain unsolved. This is a testament to how difficult it is to pinpoint the exact reason of a stillbirth[2,3]. The likelihood of a foetus's survival during gestation depends on a number of factors. The uteroplacental unit's proper functioning, the mother's health, the fetus's surroundings, and the lack of harmful foetal elements are the three main categories into which these considerations fall. Any one of these factors, or perhaps more than one, can lead to a stillbirth.

Major causes of still birth include preeclampsia/ eclampsia, preterm rupture of membrane, foetal growth restriction, antepartum haemorrhage, prolonged labour, maternal infection and maternal anaemia[4]. A careful study of these causes reveals that most of these causes can be detected early, and with timely & appropriate treatment, properly in time, the mishaps can be avoided. So, this study was done to evaluate the causes and to identify the risk factors of still birth.

AIMS AND OBJECTIVES

- To evaluate the epidemiological profile of cases of still births.
- To evaluate the associated antenatal high-risk factors, present in these cases.
- To classify the stillbirths according to ReCoDe system.

MATERIAL AND METHODS

Government Medical College and Rajindra Hospital Patiala's Obstetrics & Gynaecology Department and the Pathology Department conducted a prospective study in 2021 and 2022. The formula for determining the sample size, which is N divided by 1 plus N, was used by Solvin. Thus, we found that 200 instances was an adequate sample size for our investigation.

Inclusion Criteria:

- Women who gave birth to a dead baby at or after 24 weeks of gestational age which was calculated on the basis of USG/LMP.
- Foetuses with Apgar 0 out of 10 at 1 or 5 mins.

Exclusion Criteria:

1. Women who gave birth to dead baby before 24 weeks.
2. Foetus with Apgar > 0 at 1 or 5 mins.

- A detailed history was taken followed by examination and identifying risk factors followed by evaluation of the foetus and placenta after delivery.
- Finding out how often stillbirths occur and what factors are associated with them was the main goal.

- The secondary outcome was to classify stillbirths according to the ReCoDe (relevant condition at death) classification.

We used SPSS 25.0 for statistical analysis after entering the data in Microsoft Excel. The frequency and proportional representations were used for the categorical data. Metrics like standard deviation and mean were used to depict normally distributed continuous data. In order to ensure that the continuous data was normal, the Shapiro-Wilk test was used.

RESULT

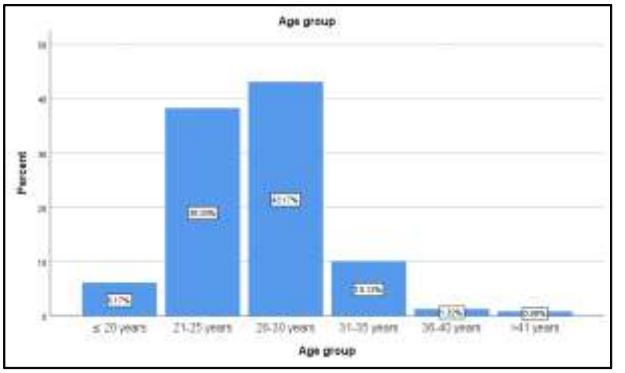

Figure 1: Bar diagram representing the age group of the study population.

Table No. 1 : Demographic profile of study subjects

Maternal age	No. of cases	Percentage
<20	14	6.16
21 – 25	87	38.32
26 – 30	98	43.17
31 – 35	23	10.13
36 – 40	03	1.32
>41	02	0.88
Gravidity		
1	91	40.08
2	71	31.27
3	40	17.62
>4	25	11.01
Abortions		
1	27	11.89
2	4	1.76
3	2	0.88
Previous Stillbirth		
1	3	1.32
Socioeconomic status		
Upper	0	0
Upper middle	7	3.08
Lower middle	115	50.66
Upper Lower	03	1.32
Lower	102	44.93

A total of 227 patients were selected based on the eligibility criteria. The mean age of the patients was 26.33±4.26 years and most of the cases of still births were seen between age group 26 to 30 years of age (43.17%. (Figure 1).

Among the 227 cases studied it was seen that maximum of 98 (43.17%) patients belonged to the age group 26-30 years, with maximum cases seen in primigravida (40.08%). Also, it was observed that 3 (1.32%) patients had a previous history of still births. 27 (11.89%) patients had 1 abortion in the past. Majority of study subjects (50.66%) belonged to lower middle class. (Table 1)

Table No. 2: Gestational age of study subjects at time of delivery

Gestational age at delivery (in weeks)	No. of Cases	Percentage
24 – 28	36	15.85
29 – 32	59	25.99
33 – 36	78	34.36
37 – 40	52	22.91
>41	02	0.88

It was observed that in most cases i.e., in 78 (34.36%) cases the gestational age at the time of delivery was 33-36 weeks followed by 59 (25.99%) cases where it was found to be 29-32 weeks. In 52 (22.91%) cases the gestational age was 37-40 weeks followed by 36 (15.85%) cases where it was between 24-28 weeks. Only 2 (0.88%) cases had gestational age 41 weeks or greater. (Table No. 2)

Table No 3: Birth details of Stillborn Babies

Birth Details	No. of cases	Percentage
Fresh	115	50.66
Macerated	112	49.33
Sex of Baby		
Male	128	56.38
Female	98	43.17
Ambiguous	1	0.44
Weight of Baby (gm)		
500 – 1000	59	25.99
1001 – 2000	86	37.88
2001 – 3000	65	28.63
>3000	17	7.48
Placental Weight (gm)		
<15005	2.20	
151-300	51	22.46
301 – 500	137	60.35
> 501	34	14.97

In this study, 177 (77.97%) subjects delivered vaginally, 46 (20.26%) underwent caesarean section and in four cases (1.76%) laparotomy was undertaken because of rupture uterus. Also, there were 132(58.14%) spontaneous deliveries and in 45 cases (19.82%) induction of labour was done.

It was observed in our study that out of 227 cases, 115 (50.66%) cases were fresh stillbirths (FSB) and the remaining 112 (49.33%) cases were macerated stillbirths (MSB), out of which 128 (56.38%) foetuses were males, 98 (43.17%) were females and 1 (0.44%) was with ambiguous genitalia. It was observed that mean foetal birth weight was 1767.68±854.59 gm. Most of the foetuses had birth weight between 1001-2000gm as seen in 86 (37.88%) with mean placental weight of 399.97±115.37 gm. 137 (60.35%) foetuses had placental weight between 301-500 gm. (Table No. 3)

Table No. 4: Associated antenatal risk factors

Maternal Complications	No. of cases	Percentage
Hypertension	44	19.38
Abruption	34	14.98
Severe Anaemia	30	13.21
Placenta Previa	16	7.04
Oligohydramnios	08	3.52
Cord Prolapse	06	2.64
GDM	04	1.76
Rupture Uterus	04	1.76
PROM/PPROM	03	1.32
Hyperthyroidism	02	0.88
IHCP	02	0.88
Polyhydramnios	02	0.88
Hand Prolapse	01	0.44
Chorioamnionitis	01	0.44

In case of maternal complications, the most common complication observed was hypertension seen in 44 (19.38%) cases followed by 34 (14.98%) cases of abruption, 30 (13.21%) cases of severe anaemia and 16 (7.04%) cases of placenta previa were observed. (Table No. 4)

Table No. 5: Foetal complications

Foetal Complications	No. of cases	Percentage
Intrapartum IUD	98	43.17
Severe FGR	37	16.29
Extreme Prematurity (< 28 weeks)	36	15.85
Cord Prolapse	06	2.64
CMF	01	0.40

Among foetal complications, intrapartum IUD was seen in 98 (43.17%) cases, severe FGR was observed in 37 (16.29%) accounting for the most common cause of foetal complication, followed by 36 (15.9%) cases were of extreme prematurity, 6 (2.64%) were due to cord prolapse, and 1 (0.4%) was cases of CMF (anencephaly). (Table No.5)

There were 55 cases (24.2%) who came in advanced labour and FHS were not localized but couldn't be confirmed by USG. In 31 (13.7%) cases FHS was not localized and confirmed by USG. Also 43 (18.9%) cases came with USG showing intrauterine death.

On gross examination of placenta, 152 (66.96%) were normal, 40 (17.62%) showed calcification, retroplacental clot were seen in 34 (14.97%) and true knot was seen in 1 case (0.44%).

Table No. 6 – ReCoDe classification system of still birth

ReCoDe classification		No. of cases	Percentage
Group A: Fetus	A1 (CMF)-1 A7 (FGR)-37	38	16.74
Group B: Umbilical cord	B1 (Prolapse)-6	6	2.64
Group C: Placenta	C1 (Abruption)-34 C2 (Previa)-16	50	22.02
Group D: Amniotic fluid	D1 (Chorioamnionitis)-1 D2 (Oligohydramnios)-8 D3 (Polyhydramnios)-2	11	4.84
Group E: Uterus	E1 (Rupture)-4	4	1.76
Group F: Mother	F1 (Diabetes)-4 F2 (Thyroid disease)-2 F4 (Hypertensive disease)-44 F6 (Cholestasis)-2 F8 (other-severe anemia)-1	53	23.34
Group G: Intrapartum	G1(Asphyxia)-44	44	19.38
Group I: Unclassified	I1 (No relevant condition identified)-21	21	9.25

It was observed that the most common cause of stillbirth was related to the mother which was seen in 53 (23.34%) patients followed by placental reasons for stillbirth, observed in 50 (22.02%) cases. 44 (19.38%) cases were due to intrapartum reasons and 38 (16.74%) cases of stillbirths were due to foetal related reasons. 11(4.84%) cases of stillbirths were related to the amniotic fluid and 4 (1.76%) cases were related to uterus discretely. However, 21 (9.25%) cases of stillbirth could not be classified.

DISCUSSION

The aim of this study was to study the demographic profile of women having stillbirth, to evaluate the risk factors for stillbirth in low resource settings, and to find the aetiology of stillbirth so as to facilitate designing of a stillbirth prevention strategy.

In our sample, 68.7% of the cases were unbooked and 31.3% were booked. Stillbirths are avoidable if high-risk factors are identified and treated during prenatal care. A study by Aggarwal et al (5) indicated that 29% of patients had not had any prenatal care, while 48% were already getting ANC at another healthcare institution such as a primary care clinic or a private practise before being referred to them for treatment of a missing foetal heartbeat. A sizable percentage (23%) of patients enrolled at the facility had just one or two prenatal visits.

Stillbirths occurred most often between weeks 33 and 36 weeks of pregnancy (34.4%), followed by 29 to 32 (26.0%). Similar results were found in research by Singh and Kumar (4), which found that stillbirths were more common after 32 weeks of pregnancy (54.7%).

Hypertension is a major cause of placental insufficiency leading to foetal hypoxia and foetal growth restriction. In our study hypertension was observed in 19.38% women who gave birth to stillborn babies and Abruptio placenta and placental insufficiency were responsible for 22% of stillbirths. In their research, Kulkarni et al.(6) discovered that 26% of stillbirths were caused by placental insufficiency.

Among foetal causes of still birth, Intrauterine growth restriction (15.90%) and hypoxia (11.50%) were the most common causes of stillbirth. Kothiyal et al. discovered that 15.27% of pregnancies ended in IUGR. (7)

Hence there is a pressing need for intensive prenatal monitoring in the last trimester, since this is when FGR is most likely to cause stillbirths.

CONCLUSION

Stillbirth remains a neglected issue and has received negligible policies and programs attention is underfinanced, and in an urgent need of some action.

In a developing country like India, it remains a largely underestimated problem.

A significant proportion of stillbirths is preventable by adequate and quality antenatal care.

LIST OF ABBREVIATION

ICD	International Classification of Disease
WHO	World Health Organisation
FGR	Fetal Growth Restriction
CMF	Congenital Malformation
ANC	Antenatal care
IUGR	Intra Uterine Growth Restriction

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Original Research Article

CLINICAL PROFILE OF CHILDREN WITH SNAKE BITE IN A TERTIARY CARE CENTER

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Background : Snake bite is a major public health problem which leads to significant mortality and morbidity. Its incidence is more in rural India. The clinical profile of the snake bite depends on the various factors such as the type of snake , time of arrival in to the hospital and time of the bite (daytime or nighttime)

Methods : This is a Crossectional observational study conducted in a tertiary care hospital GMC Patiala Punjab from a period of January 2023 to September 2023 on children aged 1 month to 18 years presenting with the history of snake bite and fang marks or swelling at the site or in altered sensorium or with multiorgan involvement were included in the study. The subjects were enrolled in to the study after getting their written consent. The history, physical examination , demographic profile , relevant investigations and outcomes of the patient were analyzed.

Results : : In our study total 50 patients were enrolled out of which 28 (56%) were males while 36(72%) were females. 2 (4%) in the age group of less than 1 year, 8(16%) in the age group between 1 year to 5 year,5 (10%) in the age group of between 5 years to 10 years,25 (50%) in the age group between 10 and 15 years and 10(20%) more than 15 years. 36 (72%)of the children were from rural areas while 14(28%) were from urban areas. Mean duration of arrival to the hospital was 2 hours.28(56%) cases presented with neurological dysfunction while 2 (4%) presents with disseminated intravascular coagulation while 15(30%) suffered from shock.

As per labs severe anemia was present in 12(24%) and deranged LFT observed in 10(20%) and 15(30%) suffered from prerenal AKI. Mean duration of stay at hospital was 9±1 day.

Overall mortality was 5 (10%) however absolute mortality was observed in <1 year age group.

Conclusion : : Snake bite remains a major health problem in India. In our study it was concluded that time of arrival to the hospital , type of the snake and age of the patients are the major factors which influence the final outcome of the patient.

Keywords : Snakebite, Antisnake Venom, Multiorgan Failure.

INTRODUCTION

Envenomation due to snake can cause significant morbidity and mortality. In 2014 report of American association approximately 18000 children involving less than 19 years of age were given consultation and treatment related to snake bite and 6 fatalities including one pediatrics less than 19 years of age .The bite of every venomous creature is not harmful. In many cases no venom is injected these are called dry bite. A dry bite may occur for many reasons including failure of the venom delivery mechanism and depletion of the venom. Up to 20%of the pit viper and 50% of all the snake bites are dry. The major burden of the snake envenomation is in the Southeast Asia and Sub-Saharan Africa. Most of the snake bites are in the monsoon season. There are about 2000 species of snakes in world and around 300 species in India.[1] The four most important venomous snake sin India are Indian Cobra (Naja naja), Indian krait (Bungarus caeruleus), Russel Viper (Daboia russeli) and saw

scaled viper (Echis carinatus).In India especially in the rural areas significant time is lost before the arrival to the hospital because of various traditional practices which are being followed[2]

Figure-1 : INDIAN COBRA

Figure-2 : INDIAN KRAIT

METHODOLOGY

Crossectional observational study was conducted in tertiary care center in GMC Patiala Punjab from period of January 2023 to September 20234 children aged 1month to 18 years presenting with history of snake bite and fang marks or swelling at the site or in altered sensorium, Multiorgan involvement were included in the study Informed written consent /assent was obtained from the parents/legal guardians respectively. All children were admitted through emergency into the pediatrics intensive care unit and were given antisnake venom antibodies as per weight and requirement of the child. All children were observed for signs of shock, DIC, encephalopathy, oculofacial paralysis , generalized paralysis, seizures and acute respiratory failure ,were put on appropriate ventilation strategies, I/V fluid with symptomatic management and blood components therapy. The children were tested for complete blood counts, liver function tests, renal function tests, complete urine examination, chest radiography whole blood clotting time ,prothrombin time and cranial imaging if required, and investigations were repeated as per requirement. Details of clinical profile , laboratory investigations , management and outcomes were recorded for all the participants. Abnormal viral parameters (tachycardia, tachypnea, bradycardia, bradypnea and shock) were defined as per advanced life support guidelines of Indian academy of pediatrics anemia was defined as per the hemoglobin cutoffs recommended by the WHO . A child with modified Glasgow coma scale ≤14 was considered to have encephalopathy[3]. Pediatrics acute respiratory distress syndrome, ALF and AKI standard definition were used[4,5,6]. All the detailed data recorded was analyzed for the purpose of study.

Total admissions in September 2023-January 2024 N=18000.

Children who are admitted with snake bite N=50

Analyzed N=50

Direct admissions. N=40		Referral N=10	Survival.
Deaths.	Survival.	Death	
N=39	N=1.	N=6.	N=4

RESULTS

Out of the 18000 admissions in the department of pediatrics from September 2023 to January 2024 50 patients were admitted with snake bite.

The study population ranged from age more than 1 month to 18 years where in n=3 (40%), n=8(16%), n=5(10%), n=25(50%), n=10(20%) were in the age group of less than 1 year, between 1 year to 5 years, more than 5 years to 10 years, 10 years to 15 years and more than 15 years respectively.

28 (56%) were male children whereas 22(44%) were female children.

36(72%) belonged to the rural area whereas 14(28%) belonged to the urban area.

5(10%) of the attendants brought decapitated reptiles along with to emergency. Only 10(20%) received firstaid at home or peripheral center

Parameters	n (%)
Time of arrival after snake bite	<6 hours-35 (70%) >6 hours-15 (30%)
Type of snake	Neurotoxic Snake-28 (56%) Hemotoxic Snake-12 (24%) Unknown 10 (20%)
Traditional practices before reaching Hospital	18 (36%)
First Aid In a primary health care center	10 (20%)

Outcomes:-

28(56%) cases presented with neurological dysfunction while 2-4% presents with disseminated intravascular coagulation while 15(30%) suffered from shock.

As per labs severe anemia was present in 12(24%) and deranged LFT observed in 10(20%) and 15(30%) suffered from prerenal AKI.

Mean duration of stay at hospital was 9±1 day.

Overall mortality was 5(10%) however absolute mortality was observed in <1 year age group Out of the 50 patients 30 children were given 30 vials of ASV , and 10 children were given 20 vials and 10 patients were given 10 vials .

Clinical and Lab parameters and complications
Clinical Parameters

Table - 1

Parameters	N(%)
Oculofacial paralysis	18 (36%)
Generalized paralysis and encephalopathy	10 (20%)
DIC	2 (4%)
Seizures	1 (2%)
Shock	15 (30%)
ARDS	5 (10%)

Lab Parameters

Table - 2

Parameters	N(%)
Deranged LFT	10(20%)
Deranged RFT	15(30%)
Severe anemia	12(24%)
WBCT	>20 minutes 10(20%)

Management :-

Parameters	N(%)
Intubation	30(60%)
(mechanical ventilation Sympathomimetic	15(30%)
Blood components	5(20%)
Vials of ASV	28(56%)->10 vials 12(24%)- 10 vials 10(5%)- 5 vials
Atropine and Neostigmine	28(56%)

Discussion

Over the 1 year period 50 children of snake bite were admitted in our hospital, in our study 28 (56%) were male children while 22(44%) were female children similar observations were found in the study done in Maharashtra where 34% female patients and 66% male patients were found, similarly study done by Bhat et al a ratio of 4:1 (M:F) is found. The higher incidence is found in the boys because of more involvement in outdoor activities field work[7] .

36(72%) patients belong to the rural areas while 14(28%) belong to the urban areas, similar to the study by G Bhalla et al where rural prevalence was found to be 117 out of 150 [8].

Mean duration of arrival in our hospital is 2 hours, this is in contrast to the study done by Yashwant et al in Maharashtra where 60.4% patients were admitted within 0-12 hours and 9.3% were admitted after 24 hours this delay in the arrival to the tertiary center is attributed to a number of factors such as ignorance,

unawareness and late referral from the tertiary care center.

In the present study 5 (10%) patients had brought the decapitated reptile to the hospital while the study by G Bhalla et al 8 patients brought the snake to the hospital[8].

The most common local complication is swelling and pain which is similar to the studies done by Rao KV et al [9].

The presentation at arrival is with neurological dysfunction in 28 (56%) of patients, 2(4%) patients with disseminated intravascular coagulation, while 15(30%) with shock.

In the present study the overall mortality was 5(10%) out of which 1(2%) died due to respiratory failure while 4(8%) died due to bleeding (DIC) With shock.

While in the study by Surve et al, there was mortality of 3. in all 3 of them presented to the hospital late Two cases had neurotoxic envenomation and died due to respiratory failure whereas one case had vasculotoxic snakebite died secondary to DIC with shock and acute kidney injury.

We observed upsurge of snake bite cases following rainy season and floods in certain parts of the state with people living near fields or katcha houses , confounding factors observed were where children were left unsupervised in field areas and snake bites occurred at night time. Neurological dysfunction was observed in most of the children[13].

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Abbreviations

AKI- Acute kidney injury
ARDS- Acute respiratory Distress syndrome
ASV – Anti snake venom
DIC- Disseminated intravascular coagulation
LFT – Liver function tests
NIV- Non invasive Ventilation
RFT-Renal function tests
WBCT- Whole blood clotting time

Original Research Article

COMPARISON OF CHANGES IN INTRACUFF PRESSURE IN ENDOTRACHEAL TUBE AND LARYNGEAL TUBE

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Abstract

Laryngeal tube is a supraglottic device that is used effectively for managing the airway either as rescue device or device through which intubation can be done. The present study was conducted to compare the changes in intracuff pressure in the patients with endotracheal tube (ETT) and laryngeal tube (LT). Also, postoperative complications (ST and PH) caused by changes in intracuff pressure of ETT and LT.

After approval from Institutional ethics committee, the authors randomly selected 60 patients scheduled for surgery under general anesthesia (expected to last maximum 2 hours) in supine position, belonging to either sex, aged 18-60 years and who belonged to ASA physical status I or II.

After exclusions and inclusions, the patients were divided into two groups, each comprising of 30 patients. In one group the trachea was intubated with appropriate sized ETT (ETT group) and cuff was inflated to a pressure of 24-25 cm H2O; in the other group, the airway device used was LT (LT group) and cuff was inflated to a pressure of 60 cm H2O using hand held cuff inflator with pressure gauge. All patients were premedicated with Inj. Glycopyrrolate, Inj. Fentanyl and Inj. Ondansetron. Anaesthesia was induced with Inj. Propofol 2-3 mg/kg IV. Airway device was inserted after achieving neuromuscular blockade with inj. Vecuronium 0.1 mg/kg. Anaesthesia was maintained using O2 /N2O/ Iso and Inj. Vecuronium for muscle paralysis. At the end of surgery, anaesthesia was reversed using appropriate doses of Neostigmine (50-70µg/kg) and Glycopyrrolate (10µg/kg).

Standard monitoring was instituted along with peak airway pressure and intracuff pressure of the respective airway used (measured every 15 min. starting from cuff inflation to 1 hour). Patients were also assessed for features of airway obstruction, gastric regurgitation and any evidence of airway/oropharyngeal trauma at the time of extubation (visual inspection of device for presence of blood and inspection of oral cavity for evidence of trauma); postoperatively for evidence of sore throat (ST), postoperative hoarseness (PH) and tongue numbness in PACU (2 hours) and in ward (1 day postoperatively). Appropriate statistical tests were applied.

The demographic profile was similar in both groups and all the patients in both the groups could be ventilated adequately with their respective airway device throughout the study period as indicated by end tidal CO2 measurements, SPO2, Peak Airway pressures and Mean airway pressures at various points of times. The hemodynamics i.e. Heart rate, Systolic Blood Pressure, Diastolic Blood Pressure, Mean Arterial Pressure, Oxygen saturation and EtCO2 were also comparable (Table 2-7).

The peak airway pressures and mean airway pressures were comparable. In both the groups 3 patients had blood on the equipment as observed after extubation. No patient had dysphagia in any of the groups and 4 patients in each group had hoarseness in immediate postoperative period. Three patients had felt sore-throat in immediate postoperative and 2 hours in ETT group and 4 patients in LT group at immediate postoperative period and 2 patients after 2 hours.

It was concluded that both ETT and LT can be effective used for controlled ventilation, during general anaesthesia; the intracuff pressure increases in both these devices to similar levels and might contribute to LPM; the incidence of PH is decreased by use of LT instead of an ETT, hence LT can be an effective alternative to ETT.

Key Words : Laryngeal tube; ETT, Intracuff pressure.

INTRODUCTION:

Intubation of trachea is an important practice of protection of airway and maintenance of patent airway while delivering positive pressure ventilation.1 With the advent and increasing availability of supraglottic devices (SGD), these devices have become very popular for maintenance of airway and means of providing ventilation.2-5 Laryngeal tube (LT) is one of the class of SGD that was introduced few years back. LT has been successfully used in anaesthesia practice for PPV and also during CPR. However, all these devices including ETT have their complications. Laryngopharyngeal morbidity (LPM), including sore throat and hoarseness is one of them. Increase in cuff pressure with use of N2O besides other factors has been implicated as one of the causes of LPM.6-7

The present study was conducted to compare the degree of rise in cuff pressure over time in ETT and the LT and to compare the incidence of LPM (ST and PH) with the use of these devices.

The aims of the study were to evaluate and compare the changes in intracuff pressure of ETT and LT in routine surgeries under general anaesthesia and to compare the incidence of postoperative complications (ST and PH) caused by changes in intracuff pressure of ETT and LT.

MATERIAL AND METHODS

The present study was conducted in the tertiary hospital of north India and after an approval from departmental research and institutional ethics committee. Total 60 ASA physical status I or II patients, belonging to either sex, aged 18-60 years were randomly selected for patients who were scheduled for surgery under general anesthesia (expected to last max 2 hours) in supine position. All the patients weighed between 30-70 kg and measured 150-180 cm in height. Procedure was explained to the patients and informed written consent was obtained from all who participated. Patients who were full stomach or were considered at risk of pulmonary aspiration of gastric contents (including obese and pregnant patients); those having restricted mouth opening (<3 cm), pathology in neck / upper respiratory tract / upper alimentary tract, history of recent sore throat / hoarseness were excluded from the study.

The patients were divided into two groups, each comprising of 30 patients. In one group the trachea was intubated with appropriate sized ETT (ETT group) and cuff was inflated to a pressure of 24-25. cm H2O; in the other group, the airway device used was LT (LT group) and cuff was inflated to a pressure of 60 cm H2O using hand held cuff inflator with pressure gauge (VBM Medizinteknic).

All patients were premedicated with Inj. Glycopyrrolate 5 µg/kg IV, Inj. Fentanyl 2 µg/kg IV and Inj. Ondansetron 0.1 mg/kg IV. Anaesthesia was induced with Inj. Propofol 2-3 mg/ kg IV. Airway device was inserted after achieving neuromuscular blockade with inj. Vecuronium 0.1 mg/kg. Anaesthesia was maintained using O2 /N2O/ Isoflurane and Inj. Vecuronium for muscle paralysis as determined by NMB monitoring. At the end of surgery, anaesthesia was reversed using appropriate doses of Neostigmine (50-70µg/kg) and Glycopyrrolate (10µg/kg).

The patients were monitored for continued ECG, pulse oximetry, NIBP, EtCO2, NMB, temperature, peak airway pressure and intracuff pressure of the respective airway used (measured every 15 min. starting from cuff inflation to 1 hour) using the hand-held cuff inflator with pressure gauge. Patients were also assessed for features of airway obstruction, gastric regurgitation any evidence of airway/ oropharyngeal trauma at the time of extubation (visual inspection of device for presence of blood and inspection of oral cavity for evidence of trauma);

postoperatively for evidence of sore throat (ST) , postoperative hoarseness (PH) and tongue numbness in PACU (2 hours) and in ward (1 day postoperatively).

PH and ST were graded as follows7:

Grade	PH	ST
0	No PH (answered in negative by patient)	No ST (answered in negative by patient)
1	Noticed by patient	Mild (pain with deglutition)
2	Obvious to observe	Moderate (constant pain, increase with swallowing)
3	Aphonia	Severe (interferes with eating, needs analgesics)

Statistical Analysis

Our sample size was based on the results of previous studies,8 the sample size was 26 patients per group with a power of 90% and a confidence interval of 95%. Thirty patients in each group were recruited to compensate for a dropout rate of 20%.

The data was analyzed using IBM SPSS STATISTICS (version 26.0). Discrete categorical data were represented by number or percentage (%); continuous data, assumed to be normally distributed and it has been written either as its mean and standard deviation or as its median and interquartile range, as necessary. The normality of quantitative data was verified by measurements from the Kolmogorov-Smirnov normality tests. Student t-test or Mann Whitney U test was applied to compare 2 groups depending upon normality of the data. Proportions were compared using Chi square or Fisher's exact test, depending on their applicability for 2 groups. For comparison (time related variables) of hemodynamic repeated measure ANOVA was applied. Wilcoxon Signed rank test was used for skewed data (time related variables). All the statistical tests were two-sided and was performed at a significance level of α=0.05.

Results

The demographic profiles of the patients in the two groups were similar (Table 1).

Table 1: Table showing various demographic variables with frequency distribution and mean ± SD along with p-values.

DEMOGRAPHIC VARIABLES	Group ETT (n=30)	Group LT (n=30)	p-value
Sex Distribution M/F (n%)	14 / 16 (48% / 52%)	14 / 16 (48% / 52%)	**1.000***
Age (in years)	36.00 ± 10.57	39.14 ± 11.57	**0.165##**
Weight (in kg)	65.32 ± 9.34	66.44 ± 8.75	**0.537#**
Height (in cm)	163.76 ± 10.10	164.08 ± 8.80	**0.866#**
BMI (in kg/m^2)	24.42 ± 3.36	24.79 ± 3.58	**0.746##**
ASA Category I/II (n%)	15 / 15 (50% / 50%)	10 / 20 (33% / 67%)	**0.295***

* chi-square test; # Independent t-test, ## Mann-Whitney 'U' test

All the patients in both the groups could be ventilated adequately with their respective airway device throughout the study period as indicated by end tidal CO2 measurements at various points of times, SPO2, Peak Airway pressures and Mean airway pressures. The hemodynamics i.e. Heart rate, Systolic Blood Pressure, Diastolic Blood Pressure, Mean Arterial Pressure, Oxygen saturation and EtCO2 were also comparable (Table 2-7).

The peak airway pressures and mean airway pressures were comparable. (Table 8-9).

Table 2: Table showing Heart Rate in both groups at different time intervals Data is expressed as mean ± SD

	Group ETT (n=30)	Group LT (n=30)	p-value
	Mean ± SD	Mean ± SD	
Baseline HR	81.62 ± 13.52	80.72 ± 17.48	0.774
HR after 15 minutes of cuff Inflation	104.02 ± 14.75	94.78 ± 1.1	0.064
HR after 30 minutes of cuff Inflation	82.92 ± 14.66	76.22 ± 13.69	0.060
HR after 45 minutes of cuff Inflation	79.94 ± 13.17	74.46 ± 12.21	0.063
HR after 60 minutes of cuff Inflation	77.60 ± 12.17	73.64 ± 13.18	0.722

* Independent t-test

Table 3: Table showing Systolic Blood Pressure in both groups at different time intervals Data is expressed as mean ± SD

	Group ETT (n=30)	Group LT (n=30)	p-value
	Mean ± SD	Mean ± SD	
Baseline HR	116.84 ± 11.47	119.94 ± 10.31	0.158
HR after 15 minutes of cuff Inflation	117.56 ± 11.83	117.78 ± 10.93	0.923
HR after 30 minutes of cuff Inflation	100.04 ± 9.01	113.36 ± 11.50	0.111
HR after 45 minutes of cuff Inflation	117.48 ± 13.70	119.86 ± 112.06	0.004*
HR after 60 minutes of cuff Inflation	113.44 ± 13.09	109.08 ± 13.20	0.100

* Independent t-test

Table 4: Table showing Diastolic Blood Pressure in both groups at different time intervals Data is expressed as mean ± SD

	Group ETT (n=30)	Group LT (n=30)	p-value
	Mean ± SD	Mean ± SD	
Baseline DBP	76.08 ± 11.67	78.83 ± 10.55	0.38
DBP after 15 minutes of cuff Inflation	68.08 ± 13.34	68.61 ± 12.02	0.86
DBP after 30 minutes of cuff Inflation	71.06 ± 15.99	69.44 ± 15.01	0.66
DBP after 45 minutes of cuff Inflation	69.64 ± 15.02	65.14 ± 12.02	0.17
DBP after 60 minutes of cuff Inflation	67.33 ± 14.60	67.58 ± 12.85	0.94

Table 5: Table showing Mean Blood Pressure in both groups at different time intervals Data is expressed as mean ± SD

	Group ETT (n=30)	Group LT (n=30)	p-value
	Mean ± SD	Mean ± SD	
Baseline MBP	96.47 ± 10.98	99.78 ± 12.29	0.23
MBP after 15 minutes of cuff Inflation	84.53 ± 14.24	84.58 ± 13.17	0.99
MBP after 30 minutes of cuff Inflation	87.11 ± 15.57	84.47 ± 14.89	0.46
MBP after 45 minutes of cuff Inflation	85.89 ± 14.44	79.67 ± 12.46	0.06
MBP after 60 minutes of cuff Inflation	82.53 ± 14.19	82.00 ± 12.64	0.87

Table 6: Table showing SPO2 in both groups at different time intervals Data is expressed as mean ± SD

	Group ETT (n=30)	Group LT (n=30)	p-value
	Mean ± SD	Mean ± SD	
Baseline SPO2	98.64 ± 1.38	98.53 ± 1.21	0.72
SPO2 after 15 minutes of cuff Inflation	99.64 ± 0.72	99.67 ± 0.59	0.85
SPO2 after 30 minutes of cuff Inflation	99.61 ± 0.60	99.61 ± 0.60	1.00
SPO2 after 45 minutes of cuff Inflation	99.56 ± 0.61	99.56 ± 0.80	0.74
SPO2 after 60 minutes of cuff Inflation	99.53 ± 0.74	99.64 ± 0.68	0.51

* Independent t-test

Table 7: Table showing ETCO2 in both groups at different time intervals Data is expressed as mean ± SD

	Group ETT (n=30)	Group LT (n=30)	p-value
	Mean ± SD	Mean ± SD	
Baseline ETCO2	-	-	-
ETCO2 after 15 minutes of cuff Inflation	34.17 ± 2.84	33.28 ± 3.90	0.05
ETCO2 after 30 minutes of cuff Inflation	33.28 ± 2.51	32.11 ± 2.64	0.06
ETCO2 after 45 minutes of cuff Inflation	32.22 ± 2.14	31.83 ± 2.05	0.43
ETCO2 after 60 minutes of cuff Inflation	32.72 ± 2.42	32.25 ± 1.95	0.36

* Independent t-test

Table 8: Table showing Peak Airway Pressure (PAP) in both groups at different time intervals
Data is expressed as mean ± SD

	Group ETT (n=30)	Group LT (n=30)	p-value
	Mean ± SD	Mean ± SD	
Baseline PAP	-	-	-
PAP after 15 minutes of cuff Inflation	34.17 ± 2.84	33.28 ± 3.90	0.06
PAP after 30 minutes of cuff Inflation	33.28 ± 2.51	32.11 ± 2.64	0.07
PAP after 45 minutes of cuff Inflation	32.22 ± 2.14	31.83 ± 2.05	0.43
PAP after 60 minutes of cuff Inflation	32.72 ± 2.42	32.25 ± 1.95	0.36

* Independent t-test

Table 9: Table showing Mean Airway Pressure (P_{Mean}) in both groups at different time intervals
Data is expressed as mean ± SD

	Group ETT (n=30)	Group LT (n=30)	p-value
	Mean ± SD	Mean ± SD	
Baseline P_{Mean}	-	-	-
P_{Mean} after 15 minutes of cuff Inflation	7.22 ± 1.51	7.22 ± 1.27	1.00
P_{Mean} after 30 minutes of cuff Inflation	7.44 ± 1.34	6.97 ± 1.28	0.13
P_{Mean} after 45 minutes of cuff Inflation	7.58 ± 1.42	7.08 ± 1.27	0.12
P_{Mean} after 60 minutes of cuff Inflation	7.75 ± 1.32	7.28 ± 1.26	0.12

* Independent t-test

Table 10: shows mean intracuff pressure (MICP) in both the groups at different time intervals. It was 25.25 cm of H_2O in ETT group when it was inserted and fixed as compare to 60.40 cm H2O when LT was inserted and then measured. From 25.25 it increased to 33 cm of H_2O in one hour duration and from 60.40 cm H_2O to 80.14 cm H_2O. When the percentage of increase was measured from baseline and it was 32.3 % in ETT and 32.7 % in LT group. (Table 11)

	Group ETT (n=30)	Group LT (n=30)	p-value
	Mean ± SD	Mean ± SD	
Baseline MICP (Immediately After insertion)	**25.25**	**60.40**	-
MICP after 15 minutes of cuff Inflation	26.75	64.50	
MICP after 30 minutes of cuff Inflation	29.41	68.30	
MICP after 45 minutes of cuff Inflation	31.16	76.50	
MICP after 60 minutes of cuff Inflation	33.00	80.14	

* Independent t-test

Table 11: Table showing percentage increase of Intracuff pressure (PIMICP) in both groups at different time intervals.

	Group ETT (n=30)	Group LT (n=30)
	Mean ± SD	Mean ± SD
Baseline PIMICP (Immediately After insertion)	-	-
PIMICP after 15 minutes of cuff Inflation	5.9	6.7
PIMICP after 30 minutes of cuff Inflation	14.8	13.07
PIMICP after 45 minutes of cuff Inflation	23.4	26.65
PIMICP after 60 minutes of cuff Inflation	30.3	32.68

Table 12: Postoperative complications

	Group ETT (n=30)	Group LT (n=30)	P VALUE
Presence of blood on equipment	3	3	1.00
Dysphagia			
0 hours	0	0	
2 hours	0	0	
24 hours	0	0	
Hoarseness			
0 hours	4	4	1.00
2 hours	0	0	NA
24 hours	0	0	NA
Sore throat			
O hours	3	4	1.00
2 hours	3	2	0.69
24 hours	0	0	NA

Table 12 shows the postoperative complications. In both the groups 3 patients had blood on the equipment as observed after extubation. No patient had dysphagia in any of the groups and 4 patients in each group had hoarseness in immediate postoperative period. Three patients had felt sore-throat in immediate postoperative and 2 hours in ETT group and 4 patients in LT group at immediate postoperative period and 2 patients after 2 hours.

Discussion

Nitrous Oxide (N_2O) is known to diffuse in air filled cavities including cuffs of airway devices resulting in increase in volume and intracuff pressure. Disposable PVC ETT with high-volume low-pressure cuffs are mostly used now-a-days. In these cuffs the nitrous oxide penetrates and diffuses into it and increases intracuff pressure.

The rise in intracuff pressure of airway devices contributes to laryngopharyngeal morbidity.[7] Intracuff pressure has been shown to be an excellent predictor of mucosal pressure and perfusion. Further pressure exerted on mucosa has been shown to be a causative factor postoperative sore throat and hoarseness.

In the present study all hemodynamic and ventilator parameters were similar and difference in these parameters were statistically insignificant. The mean intracuff pressure was increased in both the groups (Table 10) and the percentage of increase was in both the devices. In 45 minutes of introduction of both devices, percentage of increase of mean intracuff pressure was 5.9 to 30.3 in ETT group and from 6.7 to 32.68 in LT group. The increase was significant from baseline as nitrous oxide might have diffused inside the cuff and increased the pressure. This increased the incidence of sore throat and hoarseness in first few hours in both the groups.

Splinter and Smallman in 1994 quoted the incidence to be 13% with LMA use and 5% with ETT in children.[9] In both the groups 3 patients had blood on the equipment as observed after extubation. No patient had dysphagia in any of the groups and 4 patients in each group had hoarseness in immediate postoperative period. Three patients had felt sore-throat in immediate postoperative and 2 hours in ETT group and 4 patients in LT group at immediate postoperative period and 2 patients after 2 hours.[9]

In 1997, Reiger et al showed the incidence of dysphagia to be 23.8% after LMA use and 12.5% after ETT use. Various factors have been implicated in causation of post-operative ST like depth of anaesthesia, method of insertion of airway device, number of attempts made for placements of the

device, presence of HME filter in circuit, sex of the patient, and duration of anaesthesia and postoperative analgesia. In our patients, device could be placed in single attempt in all the patients, we did not use an HME filter, and duration of anaesthesia was almost the same in all the patients. Patients were well anaesthetized before airway manipulation and adequate analgesia was provided to all patients in postoperative period.[10]

Factors implicated in causation of PH are ETT size and cuff designs, airway humidity and trauma during insertion and suction, the placement of device was atraumatic in all patients, airway humidity played similar role in both groups, obviously patients in LT group were not exposed to any maneuvers below the glottis which might account for lesser incidence of PH in this group of patients.

Reiger et al showed the incidence to be 46.8% with ETT and 25.3% with LMA. The authors noted the incidence of PH to be 33.3% with ETT and 13.3% with LT ($p<0.05$).[10] The severity of ST and PH was mild in most of the patients except 3 patients in ETT group and 4 in LT group, who had moderate (grade 2) ST and 3 patients in ETT group has moderate (grade 2) PH while all 4 patients in LT group had mild PH. Neither ST nor PH persisted beyond 24 hours in any of the patients. Intracuff pressure has been shown to correlate to pressure exerted on mucosa and consequent mucosal perfusion, Asai and Kawachi in 2001 showed that in LT at intracuff pressure of 60 cmH_2O pressure exerted on mucosa is 29 (24-36) cmH_2O and at intracuff pressure of 70 cmH_2O, pressure exerted on mucosa is 37 (26-60) cm H_2O 12, Brimacombe J showed in 2005 that at intracuff pressure of 124 cmH_2O the exerted mucosal pressure was 46 cmH_2O.[12] Seegobin and colleagues showed in 1984 that tracheal mucosal perfusion begins to decrease when mucosal pressure exceeds 30 cm H_2O and begins to cease when mucosal pressure exceeds 50 cm H_2O.[12]

Brimacombe on the other hand, correlated pharyngeal mucosal pressure with mucosal perfusion by direct measurement of pharyngeal mucosal pressure with mucosal perfusion by direct measurement of pharyngeal mucosal pressure and showed that patients mucosal blood vessels (BVs) begin to compress at mucosal pressure at 34 cm H2O and their BVs begin to collapse at mucosal pressure at 73 cm H_2O.[13] According to Asai & Shingu's work in 2004, the intracuff pressure rises to 77 cmH2O 60 min with use of N_2O and may go upto 102 cm H2O after 110 min, while the pressure remains stable if air is used instead of N_2O.[12]

Various methods have been advocated to limit the increase in cuff pressure during anaesthesia delivery, some of which are – avoidance of N_2O during anaesthesia and use of air instead of it; use of saline to inflate the cuff, the cuff may be inflated with anaesthetic gas mixture instead of air; intermittent release of pressure can also limit the increase in pressure; use of tubes with foam cuffs can be tried, tubes with Profile-soft-seal cuffs (PSSC); Brandt anaesthesia tube also limits N_2O related increase in intracuff pressure, pharmacological methods can be tried to prevent postop ST such as transdermal ketoprofen, ketamine gargles, gargling with sodium azulene sulfonate, lubrication of tube with betamethasone gel, pre-op use of dexamethasone iv have been shown to decrease incidence of ST.[14]

The blood on the supraglottic or the ETT shows the insertion difficulties in the experienced hands. Its incidence is comparable in the present study. Experienced anaesthesiologists perform well in the airway procedures and incidence of complications decrease with them.

Conclusions

It is concluded that both ETT and LT can be effectively used for controlled ventilation, during general anaesthesia. The intracuff pressure increases in both these devices similarly and might contribute to laryngopharyngeal morbidity. The incidence of postoperative hoarseness is decreased in patients where LT was used.

Continuous monitoring of intracuff pressure is necessary so as to decrease the incidence of pharyngeal mucosal ischemia. Hence, the present study concludes that LT can be an effective alternative to ETT .

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Original Research Article

MANAGEMENT OF TUBERCULOSIS - NTEP GUIDELINES

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Abstract

The year 2019 saw an estimate by WHO that 10 million fresh cases of TB emerged globally, with a staggering 97% of them emerging in low- & middle-income countries.[1] Among these cases, 57% were seen in men, 32% in women, and the remaining 11% in children. Shockingly, approximately 1.4 million fatalities were recorded due to TB that year, including around 0.21 million among individuals co-infected with HIV. In India, the burden of tuberculosis infection (TBI) is believed to be the highest globally, with an estimated range of 350-400 million individuals living with TBI. Of these numbers, roughly 2.6 million are reported as tuberculosis (TB) cases annually. TB ranks as the 13th leading cause of death on a global scale and continues to plague HIV-infected individuals. Management, diagnosis quality, and treatment services for tuberculosis under the program are provided free of charge nationwide with the vision of achieving a TB-free India by 2025. The typical drug regimen for Tuberculosis includes an intensive two-month phase followed by a four-month continuation phase. However, the duration of treatment may vary based on severity/organ involvement, necessitating tailored regimens in certain cases such as those involving pregnant women or issues with liver or kidney function as per NTEP guidelines.

INTRODUCTION

Coming from the Mycobacteriaceae family and Actinomycetes order, Mycobacteria has eight distinct groups within the Mycobacterium tuberculosis complex. Of these groups, Mycobacterium tuberculosis is highlighted as the primary agent causing human disease among pathogenic bacteria within this complex. Typically affecting the lungs but potentially spreading to other organs in up to one-third of cases.

PRESUMPTIVE TB CASE:

An individual exhibiting signs like cough lasting over two weeks, prolonged fever, significant weight loss, blood-stained sputum coughed up from the lungs (hemoptysis), night sweats, or any anomalies detected in chest X-rays might be considered a presumptive TB case.

TUBERCULOSIS INFECTION (TBI):

Individuals who show persistent immune responses towards M. tuberculosis antigens without any clear evidence of active TB disease are considered to have TBI or latent TB [LTBI]. Tests like TST and IGRA help assess LTBI.[8]

TUBERCULOSIS (TB) DISEASE:

This condition manifests itself when someone infected with M. tuberculosis showing symptoms or signs suggestive of TB disease.

MULTI DRUG RESISTANT –TB:

MDR-TB arises from strains resistant at least to Isoniazid and Rifampicin – anti-TB drugs with potential resistance to other first-line anti-TB medications too.[2]

WHO's Recently Published Definitions include:

Pre-XDR-TB: MDR/RR-TB Mycobacterium tuberculosis strains additionally resistant to any fluoroquinolones.[2]

XDR-TB: This refers to MDR/RR-TB strains showing additional resistance to any fluoroquinolone along with at least one more Group A drug including levofloxacin/moxifloxacin coupled with bedaquiline & linezolid.[2]

RESISTANCE	TO
H MONO DRUG RESISTANTANCE	ISONIAZID ONLY (M/C)
MDR TB	Atleast resistant ISONIAZID + RIFAMPICIN
RIFAMPICIN RESISTANT TB	RIFAMPICIN ONLY
PRE- XDR TB	MDR+ ANY FLOROQUINOLONE
XDR TB	MDR+ ANY FLOROQUINOLONE + ANY GROUP A DRUGS

CURED:

A pulmonary TB patient with bacteriologically confirmed TB at the beginning of treatment and followed the national treatment policy has been deemed Cured if they show evidence of bacteriological response and no signs of treatment failure.[3]

LOST TO FOLLOW UP:

A patient who failed to commence treatment or had their treatment discontinued for a consecutive month or more is classified as Lost to follow-up.

TREATMENT FAILED:

For a patient whose treatment regimen was altered permanently or needed to be stopped due to inefficacy, it is considered Treatment failed.

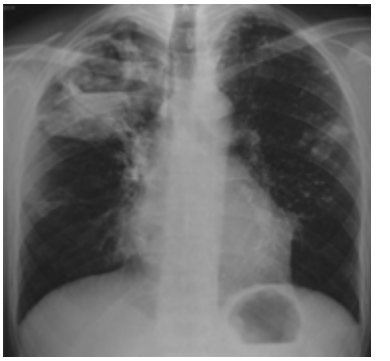
TREATMENT COMPLETED:

One who complies with the national policy's prescribed treatment and does not fit the criteria for cure or treatment failure is labeled Treatment completed.

SPREAD:

The most contagious form of tuberculosis involves cavitary pulmonary disease or, less commonly, laryngeal TB, wherein sputum may contain as many as 105–107 AFB/mL Bacilli - this can persist for years before reactivating, typically resulting in secondary (or postprimary) TB. This form is more infectious than primary disease due to the frequent presence of cavities. Approximately 10% of infected individuals are projected to develop active TB during their lifetime, with half within the first 18 months following infection - especially enhanced among immunocompromised individuals and those with HIV. In many cases, lesions from TB naturally heal and become evident only through small calcified nodules. Pleural reactions involving subpleural focuses are common - also known as the Ghon complex when associated with lymphadenopathy. Pleural effusion is prevalent in up to two-thirds of cases, often stemming from bacilli entering the pleural space from neighboring subpleural areas. In severe instances, primary sites may necrose centrally, leading to cavitation – termed as progressive primary TB.

POSTPRIMARY (ADULT-TYPE) DISEASE - also known as reactivation or secondary TB - predominantly affects apical and posterior segments of upper lobes due to higher oxygen tension in these regions compared to lower zones.



In about 90% of cases, cough develops eventually, possibly starting off as nonproductive and confined to mornings before progressing to purulent sputum production - at times including blood streaks. Hemoptysis arises in 20-30% cases, occasionally culminating in massive bleeding from vessel erosion within cavity walls (Rasmussen's aneurysm) or due to aspergilloma formation within cavities.

Patients may experience pleuritic chest pain in instances of subpleural parenchymal lesions or pleural involvement. Extensive disease could lead to dyspnea, while acute respiratory distress syndrome (ARDS) may occur rarely.

MANAGEMENT OF PULMONARY TB[6]

Type	Treatment Regimen in IP	Treatment Regimen in CP
Previously treated and New cases (H and R Sensitive)	2HRZE	4HRE

Diagnostic Modalities:

1. Chest X-ray: Not very specific, can see cavities.
2. Sputum for AFB: Take 5ml of sputum, test within 24 hrs. Two samples taken: a spot sample and a morning sample. If any one sample is positive, sputum is taken as positive. NAAT is more sensitive than sptum for AFB.

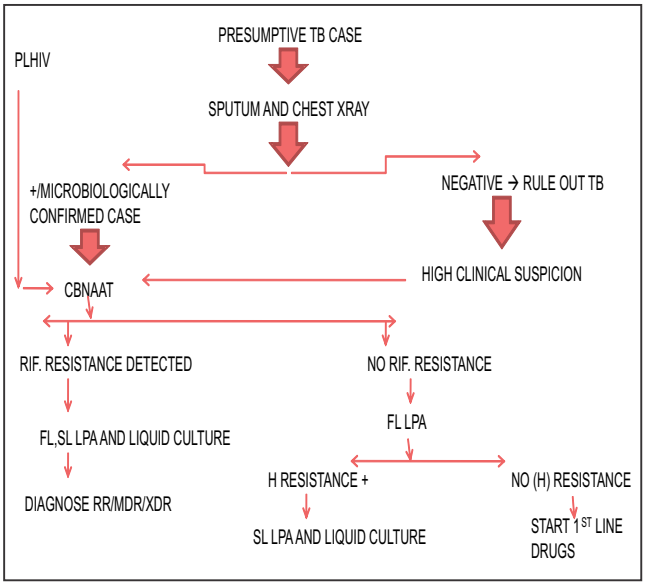
3. CBNAAT: Test results in 2 hrs, provides Rifampicin sensitivity status. Highly sensitive and specific as it shows much less false negative results even in paucibacillary cases.

EXTRAPULMONARY SAMPLES	CBNAAT SENSITIVITY
CSF	71%
LYMPH NODES	82%
PLEURAL FLUID	50%
PERITONEAL FLUID	59%

4. TruNAAT: Local device, cheaper (used for TB diagnosis in India). It also tells about the Rifampicin sensitivity. Trunaat result also takes 2 hours, 1 hour for MTB detection and 1 hour for R sensitivity if MTB detected.
5. LPA: Results in 3 days.
6. Culture:

* Liquid culture (LC): Gold standard, results in 2-4 weeks
* (LJ media) Solid culture: Results in 6-9 weeks.

Algorithm for management of Presumptive TB case[5]:



WEIGHT BANDS OF FDC IN ADULTS:

WEIGHT (KGS)	NO. OF FDC TABLETS (HRZE) - 75/150/400/275MG
25-34	2
35-49	3
50-64	4
65-75	5
>75	6

DRUG DOSAGE OF FIRST LINE ATT IN ADULTS:

DRUGS	ADULT DOSAGE
ISONIAZID	5 mg/kg daily
RIFAMPICIN	10 mg/kg daily
PYRAZINAMIDE	25 mg/kg daily
ETHAMBUTOL	15 mg/kg daily
STREPTOMYCIN	15mg/kg daily

REGIMEN FOR TREATMENT OF DRUG SENSITIVE AND DRUG RESISTANT TB:[8]

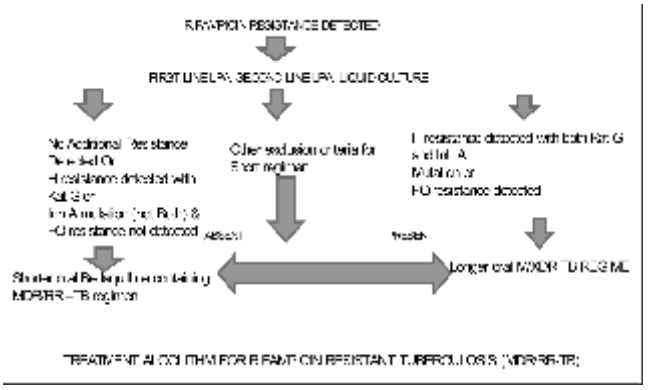
Management of TB:		
Regimen class	*Intensive phase*	*Continuation phase*
	DSTB(Drug sensitive TB)	
DSTB	HRZE(2 months) Isoniazid (H) Rifampicin(R) Ethambutol(E) Pyrazinzmide(Z)	HRE (4 months)
	DRTB(Drug resistant TB)	
H mono/poly DR-TB	ZERO(6 months) [o-levoflox]	
Shorter MDR/RR-TB	CHOBZEE(4-6 months) Clofazimine High dose Isoniazid Levofloxacin(o) Bedaquiline Pyrazinamide Ethambutol Ethionamide	COZE(5 months) Clofazimine Levofloxacin Pyrazinamide Ethambutol

Longer MDR	**C2 L2 B(18-20 months) (oral regimen)** Levofloxacin Linezolid Bedaquiline Cycloserine Clofazimine

In Longer MDR regime, Linezolid to be reduced to 300 mg after 6-8 months of treatment. Give Bedaquiline for 6 months and in exceptional cases can be given for more than 6 months

1st line drugs	Activity	CSF Penetration
Pyrazinamide	Cidal	95-100%
Isoniazid	Cidal	90-95%
Ethambutol	Static	10-50%
Streptomycin	Cidal	10-20%
Rifampicin	Cidal	5-25%

2nd line drugs	Activity	CSF Penetration
Linezolid	Cidal	80-100%
Ethionamide	Cidal	80-95%
Moxifloxacin	Cidal	70-80%
Levofloxacin	Cidal	60-80%
Cycloserine	Static	40-70%
Amikacin	Cidal	10-25%
Kanamycin	Cidal	0-43%



Dosage for shorter oral bedaquilline containing MDR/ RR-TB regimen for adults

SN	Drugs	16-29 kg	30-45 kg	46-70 kg	>70 kg
1	High dose H (H*)	300 mg	600 mg	900 mg	900 mg
2	Ethambutol(E)	400 mg	800 mg	1200 mg	1600 mg
3	Pyrazinamide(Z)	750 mg	1250 mg	1750 mg	2000 mg
4	Levofloxacin (Lfx)	250 mg	750 mg	1000 mg	1000 mg
5	Bedaquiline (Bdq)	Week 0–2: Bdq 400 mg daily Week 3–24: Bdq 200 mg 3 times per week			

SN	Drugs	16-29 kg	30-45 kg	46-70 kg	>70 kg
6	Clofazimine (Cfz)	50 mg	100 mg	100 mg	200 mg
7	Ethionamide (Eto)*	375 mg	500 mg	750 mg	1000 mg
8	Pyridoxine (Pdx)	50 mg	100 mg	100 mg	100 mg

*Drugs can be given in divided doses in a day in the event of intolerance

TREATMENT DURATION OF MEDICAL THERAPY IN EXTRAPULMONARY TUBERCULOSIS:

Site of Disease	Initial Regimen (IP + CP)	Duration
Ocular TB	(2)HRZE + (4-7)HRE	6-9 Months
CNS TB	(2)HRZ+E/S + (10)HRE	6-12 Months
Tuberculous Otitis Media	(2)HRZE + (7)HRE	9 Months
Ear, Nose and Throat TB (Others)	(2)HRZE + (4-7)HRE	6-9 Months
Lymph node TB	(2)HRZE + (4-7)HRE	6-9 Months
Pleural TB	(2)HRZE + (4)HRE	6 Months
Pericardial TB	(2)HRZE + (4)HRE	6 Months
*Hepatobiliary TB	(2)HRZE+(4-7)HRE	6-9 Months
Intestinal TB	(2)HRZE + (4)HRE	6 Months
Urinary TB	(2)HRZE + (4)HRE	6 Months
Genital TB (Male or Female)	(2)HRZE + (4)HRE	6 Months
Spinal TB	(2)HRZE + (10-16)HRE	12-18 Months
Bone and Joint TB (others)	(2)HRZE + (10)HRE	12 Months
Cutaneous TB	(2)HRZE + (4)HRE	6 Months

H – Isoniazid, R – Rifampicin, Z – Pyrazinamide, E – Ethambutol, S – Streptomycin, Amikacin
*Treatment may be modified according to stage of Liver Disease. Refer below

TUBERCULIN SENSTIVITY TEST :

During the diagnosis of TB in children, the Tuberculin skin test serves as a helpful tool. Remember to use the standard product PPD RT23 with tween 80 and not exceed two tuberculin units for an accurate reaction to M.tb.

Indication of 10mm or more after 48-72 hours post-tuberculin indicates TB infection.

SKELETAL TB:

* Bone and joint disease pathogenesis involves reactivation from hematogenous foci or spreading from nearby paravertebral lymph nodes.
* Weight-bearing joints are commonly affected with spinal TB (Pott's disease).[3]
* In children, upper thoracic spine is a common site, while adults typically show lower thoracic and upper lumbar vertebrae involvement.

Drug therapy according to INDEX-TB guideline for drug-susceptible spinal TB comprises:

2HRZE + 10 HRE

Duration: 12 months extensible based on individual cases

Spinal surgery indications include:

1. Neurological deficit:

* Neural complications worsening during non-operative treatment
* Sudden onset paraplegia
* Severe neurological deficits like flaccid paraplegia, complete sensory/motor loss, bowel/bladder incontinence, painful paraplegia in elderly

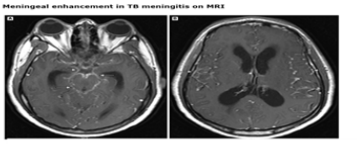
2. Absence of neurological deficit:

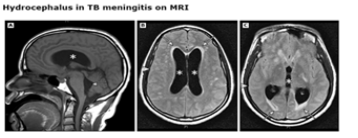
Uncertain diagnosis requiring open biopsy, mechanical spine instability

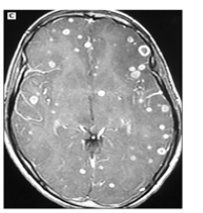
TUBERCULOUS MENINGITIS AND TUBERCULOMA :

About 5% of extrapulmonary cases involve the Central Nervous System. Tuberculous meningitis occurs if there is spread from pulmonary TB or rupture of subependymal tubercle .[4]Common symptoms include severe headache, confusion, lethargy, altered sensorium, neck rigidity. CSF analysis shows high leukocyte count (up to 1000/µL), elevated protein content (1–8 g/L)or 100-800 mg/dl, low glucose.

Immediate treatment initiation upon positive Xpert MTB; negative result does not rule out TB diagnosis and warrants further evaluation.



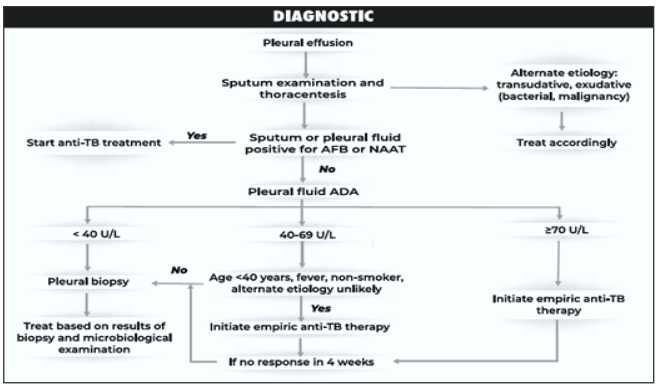




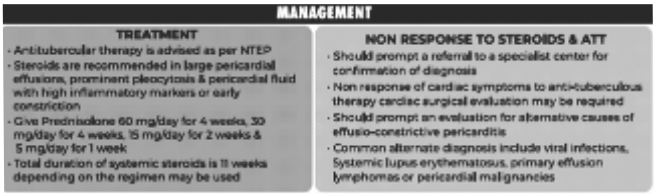
TUBERCULOMA

During the intensive phase of treatment of TBM , patients receive RHZE or RHZS for two months. In the continuation phase, they take RHE for a minimum of seven months or RHZ at least ten months. If a patient vision is problematic or cannot be evaluated, streptomycin should be used instead of ethambutol in the intensive phase. Close monitoring every month for the initial three months is crucial, with possible increases in frequency afterward until treatment completion. Intravenous Dexamethasone is administered at 0.4 mg/kg/24hrs in 3–4 split doses. Following this, patients are discharged on oral steroids with gradually decreasing doses over a total period of 8-12 weeks, with a minimum of 4 weeks of treatment.

PLEURAL EFFUSION:

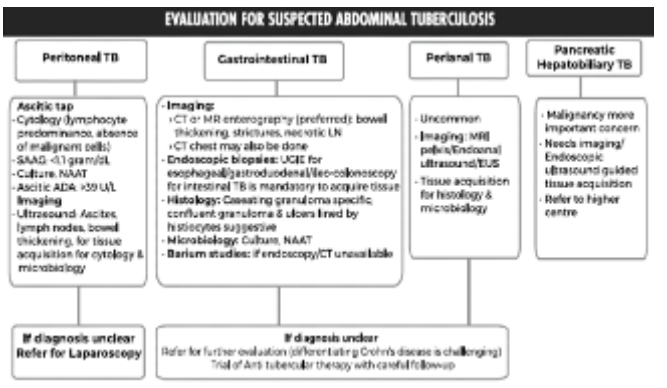


MANAGEMENT OF PERICARDIAL TB:



ABDOMINAL TB

Extrapulmonary TB =15–20% TB cases
Abdominal TB =3% Extrapulmonary TB
Tuberculosis can involve any part of GIT



PARADOXICAL REACTION:

Paradoxical reaction, refers to a worsening of existing tuberculous lesions or the appearance of new lesions in patients on anti-tubercular medication who initially showed improvement.

The deterioration within the first 3 weeks to 4 months may be attributed to a paradoxical reaction. This phenomenon has been noted in both HIV-positive and negative TB patients over the years.

It is crucial rule out other reasons for clinical decline. PR is more prevalent among HIV-infected individuals, especially within 2 months of starting combination antiretroviral therapy.

Management involves continuing the anti-tubercular treatment, providing symptomatic relief, using NSAIDs for pain, and considering USG-guided aspiration in case of fluctuance.

IRIS

Moving on to IRIS, immune reconstitution inflammatory syndrome occurs in HIV-positive individuals after starting antiretroviral therapy. It is triggered due to immune response reconstitution by an inflammatory response to an antigen .Patients with HIV and TB face a high risk of developing IRIS, which can sometimes be life-threatening. To minimize this risk, it is recommended to begin Anti-Tubercular Therapy before initiating Antiretroviral Treatment:

IRIS can manifest in two main ways: paradoxical TB-IRIS and unmasking TB-IRIS. Treatment typically involves starting ART after 3 weeks of beginning ATT and administering steroids if necessary.

BPAL REGIMEN:

Under operational research conditions, MDR-TB patients with TB resistant to fluoroquinolones who have either not previously been exposed to bedaquiline and linezolid or have only been exposed for a maximum of two weeks may benefit from a treatment regimen consisting of BEDAQUILINE, PRETOMANID, AND LINEZOLID (BPAL) that lasts six to nine months [7].

SPECIAL SITUATIONS:

PREGNANCY:

Before beginning tuberculosis treatment, it is crucial to inquire about pregnancy plans or current

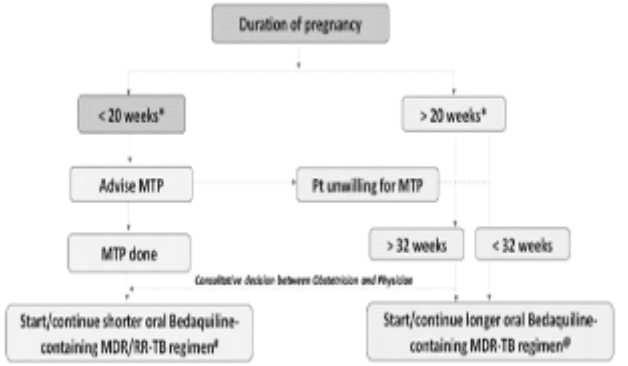
pregnancy from women of childbearing age and offer appropriate counseling. The successful treatment of TB significantly impacts the outcome of pregnancy. With the exception of streptomycin, the primary anti-TB medications are safe to use during pregnancy . Aminoglycosides should be avoided due to their teratogenicity during pregnancy.

Certain drugs like streptomycin, prothionamide, ethionamide, and quinolones are contraindicated in pregnancy.[10]

While Pyrazinamide usage is limited in the US due to safety concerns, WHO recommends its use as part of standard TB treatment for pregnant patients.

Although some drugs may pass into breast milk, breastfeeding can usually continue as these drugs rarely reach toxic levels. It's generally safe for mothers on medication to breastfeed their infants.

DR-TB IN PREGNANCY:



There is a significant risk to both mother and fetus upon treatment of DR resistant TB. However, it is important to note that, pregnancy itself is not a reason to avoid treatment. During pregnancy, second-line injectables should be avoided since they can affect the 8th cranial nerve of the fetus. Ethionamide should also be avoided in the first 32 weeks of pregnancy due to its potential harmful effects on the developing baby.

For pregnant women with drug-resistant TB, the shorter oral bedaquiline-containing regimen cannot be used. Instead, WHO recommends tailoring a longer oral M/XDR-TB regimen based on individual needs and safety considerations.

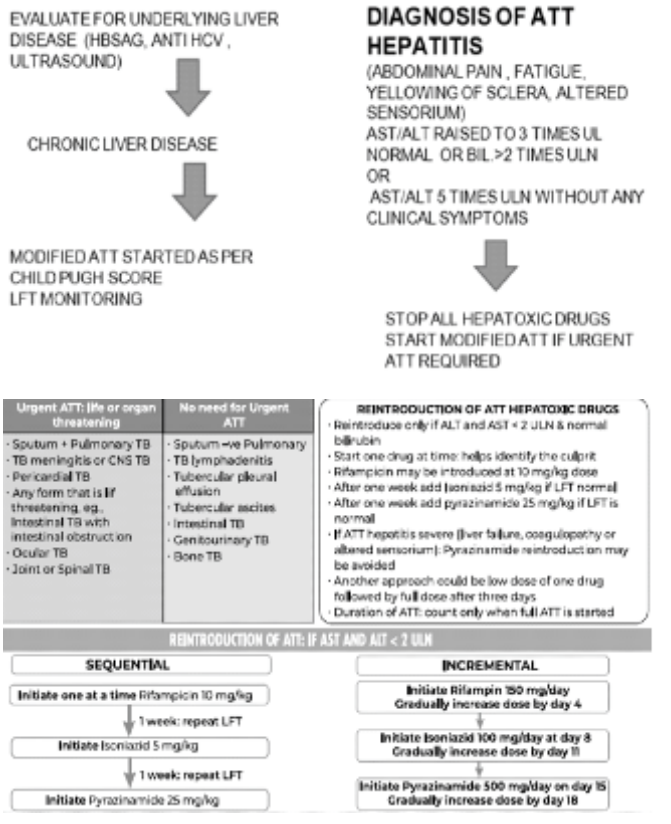
CONTRACEPTION:

When it comes to contraception, rifampicin and rifapentine can impact the effectiveness of oral or hormonal contraceptives. Women on these medications should consider alternative contraception methods like depot medroxyprogesterone acetate every eighth week or higher dose estrogen in consultation with a healthcare provider. For those with hormonal contraceptive implants, the timing for replacement may need adjustment from 12 weeks to eight weeks.

CHRONIC LIVER DISEASE :

In patients with chronic liver disease:

* When with acute hepatitis alongside a non-life-threatening EPTB, it's okay to wait on starting treatment until liver tests come back normal. If EPTB is serious, like CNS-TB, go for a modified ATT.
* The number of drugs that might harm the liver in this situation depends on how the liver disease is. The main drugs in the first line of treatment are Pyrazinamide (Z), Isoniazid (H), and Rifampicin (R). Sometimes, fluoroquinolones can also lead to hepatitis.[11]
* Patients who have had acute hepatitis or jaundice in the past don't need any changes to their standard first-line treatment.



CHILD PUGH (CTP) SCORE			
	Score 1	Score 2	Score 3
Bilirubin	< 2 mg/dl	2-3 mg/dl	>3 mg/dl
Albumin	>3.5 gm/dl	2.8-3.5 gm/dl	<2.8 gm/dl
INR	<1.7	1.7-2.2	>2.2
Ascites	Absent	Slight	Moderate
Encephalopathy	Absent	Grade 1-2	Grade 3-4

HEPATIC ENCEPHALOPATHY GRADE
- Grade 0: normal consciousness, personality & neurological examination
- Grade 1: restless, disturbances in sleep, irritability or agitated, tremors, handwriting affected
- Grade 2: lethargy, disorientation to time, asterixis, ataxia
- Grade 3: somnolent & stuporous, disoriented to place, hyperactive reflexes, rigidity
- Grade 4: unrousable coma, decerebrate

ATT SELECTION FOR UNDERLYING LIVER DISEASE	
Child Status	Suggested ATT
Child A Cirrhosis (Score 1-6) Stable Liver disease	9 months of therapy with HRE OR 2 months of therapy with HRE followed by 7 months of HR
Child B Cirrhosis (Score 7-10) Advanced Liver Disease	One hepatotoxic drug regimen can be used: Two months of therapy with INH (or) RIF with ETH & aminoglycoside, followed by 10 months of therapy with INH/RIF & ETH
Child C Cirrhosis (Score 11-15) Very advanced liver disease	No hepatotoxic drug 18 to 24 months treatment using a combination of ETH, FQL, cycloserine & aminoglycoside/ capreomycin
In Acute hepatitis	Avoid hepatotoxic drugs ATT with non-hepatotoxic drugs if urgent ATT required Wait till improvement in liver function if no urgent need of ATT

CHRONIC RENAL DISEASE:

Patients who have Chronic Kidney Disease (CKD) may starting anti-tubercular therapy (ATT). It is essential to be cautious when administering aminoglycoside drugs in these situations. Reduced creatinine clearance can result in the buildup of certain medications, leading to toxicity. Some drugs might be removed during hemodialysis, causing reduced serum levels and potential under-dosing.

Isoniazid and rifampicin are excreted through bile, so no alterations in dosages are needed. Ethambutol and pyrazinamide metabolites are significantly excreted through the kidneys, necessitating dosage adjustments.[9]

Recommended dosage of ATT drugs in ckd:

Drug*	Recommended dose in patients with creatinine clearance <30ml/min
Rifampicin	No adjustment in dose required
Isoniazid	No adjustment in dose required
Pyrazinamide	Recommended dose given three times per week (NOT DAILY)
Ethambutol	Recommended dose given three times per week (NOT DAILY)
Streptomycin	12-15 mg/kg per dose two or three times per week (NOT DAILY)

* Administer the drugs after the dialysis session on the day of haemodialysis.

Adjustment of anti-TB drugs in renal insufficiency	
Drug	Recommended dose and frequency for patients with creatinine clearance < 30 ml/min or for patients receiving hemodialysis (unless otherwise indicated dose after dialysis)
Pyrazinamide	25-35 mg/kg per dose three times per week (not daily)
Ethambutol	15-25 mg/kg per dose three times per week (not daily)
Rifabutin	Normal dose can be used, if possible monitor drug concentrations to avoid toxicity.
Streptomycin	12-15 mg/kg per dose two or three times per week (not daily)*
Capreomycin	12-15 mg/kg per dose two or three times per week (not daily)*
Kanamycin	12-15 mg/kg per dose two or three times per week (not daily)*
Amikacin	12-15 mg/kg per dose two or three times per week (not daily)*
Ofloxacin	600-800 mg per dose three times per week (not daily)
Levofloxacin	750-1000 mg per dose three times per week (not daily)
Cycloserine	250 mg once daily, or 500 mg / dose three times per week*
Para-aminosalicylic acid*	4 g/dose, twice daily maximum dose*
Moxifloxacin	No dose adjustment is necessary

Drug	Recommended dose and frequency for patients with creatinine clearance < 30 ml/min or for patients receiving hemodialysis (unless otherwise indicated dose after dialysis)
Imipenem / cilastin	For creatinine clearance 20-40 ml/min dose 500 mg every 8 hours; For creatinine clearance <20 ml/min dose 500 mg every 12 hours
Meropenem	For creatinine clearance 20-40 ml/min dose 750 mg every 12 hours; For creatinine clearance <20 ml/min dose 500 mg every 12 hours
Amoxicillin/clavulanate	For creatinine clearance 10-30 ml/min dose 1000 mg as amoxicillin component twice daily; For creatinine clearance <10 ml/min dose 1000 mg as amoxicillin component once daily

PEOPLE LIVING WITH HIV:

Patients diagnosed with HIV should prioritize beginning TB treatment following the NTEP guidelines. Antiretroviral therapy (ART) needs to commence 2 weeks after starting anti-TB treatment (ATT) and within 8 weeks at the latest. ART and ATT should be started together , if CD4 count are below 50 cells/mm3,. All newly diagnosed co-infected patients must receive a fixed-dose combination of TLE single pill based regimen, regardless of their hemoglobin levels or CD4 count.

Condition	Alternate First-line Regimen
PLHIV with body weight <30 kg	ABC 600 mg + Lamivudine 300mg, one tablet + DTG (50 mg) once daily in the morning or any fixed time every day as per patient's convenience
All patients with high (above ULN for laboratory) serum creatinine values (Calculate Creatinine clearance)	ABC 600 mg OD, Lamivudine (as per creatinine clearance**) and DTG 50 mg once daily in the morning or any fixed time every day as per patient's convenience
PLHIV on Rifampicin-containing ATT regimen	Tenofovir (300 mg) + Lamivudine (300 mg) + Dolutegravir (50 mg) – FDC one tablet once daily (in the morning or any fixed time every day as per patient's convenience) + Additional dose of DTG 50 mg to be provided (12 hours after taking their regular dose) until 2 weeks after completion of ATT
Women of childbearing potential who do not wish to take DTG-based ART after adequate and optimal counselling***	Tenofovir (300 mg) + Lamivudine (300 mg) + Efavirenz (600mg) If Efavirenz is contraindicated (HIV-2/HIV-1&2/prior NNRTI exposure) then Tenofovir (300 mg) + Lamivudine (300 mg) + [Lopinavir (200 mg) + ritonavir (50 mg) twice daily]

*For all patients with high serum creatinine values (above ULN for laboratory), calculate creatinine clearance.
**Lamivudine, along with Abacavir, may be used in full dose if creatinine clearance is more than 30 ml per minute, with patient being closely monitored.
***Women of childbearing potential receive full information and medical guidance that is appropriate to their situation and are supported in making an informed decision.

While efavirenz can be combined with rifampicin or rifapentine without adjusting the dosage, PLHIV on raltegravir and rifampicin should take a higher dose of raltegravir (800 mg twice daily). It's important not to mix rifampicin or rifapentine TPT regimens with protease inhibitors (atazanavir/ritonavir, lopinavir/ritonavir) or nevirapine for individuals living with HIV.

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Original Research Article

COMPARISON OF OPEN (HASSON'S) TECHNIQUE AND CLOSED ENTRY TECHNIQUE FOR CREATION OF PNEUMOPERITONEUM IN LAPAROSCOPIC CHOLECYSTECTOMY

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Abstract

Background : Laparoscopic cholecystectomy has become the gold standard for treating benign gallbladder disease, where the creation of a pneumoperitoneum—an insufflation of the abdominal cavity with gas—is a critical prerequisite. The main objective of the present study was to compare the safety and efficacy of the Open (Hasson's) method and Closed (Veress Needle) method for creating a pneumoperitoneum in laparoscopic cholecystectomy and to determine safe practices for pneumoperitoneum creation with minimal complications and higher efficacy.

Methods: This prospective, randomized clinical study was conducted on 50 patients divided into 2 groups having 25 patients each at Government Medical College, Rajindra Hospital, Patiala, Punjab (India) from May 2019 to December 2020, following ethical committee approval. Data was gathered by recording the time from abdominal incision to pneumoperitoneum creation and to close the wounds. Incidence of complications were noted during the procedure and during a three-month postoperative follow-up.

Results: More time was taken to achieve pneumoperitoneum and to close the port site wounds in case of Closed method of pneumoperitoneum creation, however there was no significant difference in intra-operative or post-operative complications between the two groups.

Conclusion: This study indicates that both the open (Hasson's) and closed (Veress needle) techniques are effective and safe for pneumoperitoneum creation in laparoscopic cholecystectomy, with the open technique offering a slight advantage in terms of reduced procedure time and minimal complications. Further large-scale studies may be needed to confirm these findings and provide additional insights into technique optimization.

Keywords: Laparoscopic Cholecystectomy, Pneumoperitoneum, Hasson's technique, Veress needle.

INTRODUCTION

Laparoscopy, derived from the Greek words "laparo" (abdomen) and "scopion" (to examine), initially referred to minimally invasive surgery, later evolving into "minimal access surgery" due to its invasive nature and associated risks similar to conventional open surgery[1]. Laparoscopic cholecystectomy has become the gold standard for treating benign gallbladder disease, where the creation of a pneumoperitoneum—an insufflation of the abdominal cavity with gas—is a critical prerequisite[2].

The pneumoperitoneum allows for clear visualization and examination of the abdominal contents using a laparoscope. However, accessing the peritoneal cavity presents risks of injury to major blood vessels and gastrointestinal organs, as 50% of complications in laparoscopic procedures often occur before dissection begins[3-4]. Traditional methods for creating pneumoperitoneum involve the closed Veress needle technique followed by direct trocar insertion, which introduces the trocar blindly. Conversely, the open technique (Hasson's technique) includes an initial incision into the skin, rectus sheath

and peritoneum which allows direct visualization during insertion of trocar[5], reducing the number of "blind steps" and potentially decreasing complications[6].

Despite advancements in laparoscopic techniques, the complication rates associated with primary access remain significant[7]. Studies report various rates of injuries, with complications from the Veress needle or direct trocar insertion being among the most common[8]. As surgical methods continue to improve, debate persists about the safest technique for pneumoperitoneum creation, with no clear consensus on the optimal approach. The main objective of the present study was to compare the safety and efficacy of the Open (Hasson's) method and Closed (Veress Needle) method for creating a pneumoperitoneum in laparoscopic cholecystectomy and to determine safe practices for pneumoperitoneum creation with minimal complications and higher efficacy.

Materials and Methods

Study Design

This prospective, randomized clinical study, titled "Comparison of Open (Hasson's Technique) and Closed Entry Technique for Creation of Pneumoperitoneum in Laparoscopic Cholecystectomy" was conducted at the Government Medical College, Rajindra Hospital, Patiala, Punjab (India) from May 2019 to December 2020, following ethical committee approval.

Sample and Randomization

The sample size was set at 50 patients, with an equal number (25) allocated to two groups Group 1 and Group 2 using standard randomization. Patients in Group 1 underwent peritoneal access via the open method (Hasson's Technique), and the those in Group 2 via the closed method (Veress Needle Technique).

Inclusion Criteria:

1. Patients aged 18-65 years undergoing elective laparoscopic cholecystectomy for cholelithiasis.

Exclusion Criteria:

1. Previous upper abdominal midline surgery.
2. Serious comorbidities contraindicating laparoscopic surgery (e.g., severe cardiac dysfunction, congestive heart failure, COPD).
3. Presence of palpable abdominal lumps or umbilical/para-umbilical hernias.

Treatment Protocol

Following institutional ethical committee approval, patients meeting the inclusion and exclusion criteria were thoroughly evaluated preoperatively through physical examination, abdominal and systemic examination, and routine laboratory tests (e.g., liver function tests, ultrasound for gallbladder assessment).

Peritoneal cavity was accessed by either of these two techniques.

1. **Open Technique (Hasson's Method):** After anesthetizing the patient, a 10-12 mm incision was made near the umbilicus, and the subcutaneous fat was dissected to reach and incise the linea alba and peritoneum, allowing blunt insertion of Hasson's cannula into the peritoneal cavity. After securing the cannula with a collar for gas seal, CO_2 was insufflated at a pressure of 12-15 mmHg, and the laparoscope was introduced.
2. **Closed Technique (Veress Needle Method):** A small incision was made, and the Veress needle was inserted through the linea alba at specific angles, with CO_2 insufflation at 12-15 mmHg once the cavity was accessed. After insufflation, a trocar port was inserted, and the laparoscope was introduced.

Data Collection and Analysis

Data was gathered by recording the time from abdominal incision to pneumoperitoneum creation. Incidence of complications were noted during the procedure and during a three-month postoperative follow-up. Statistical analysis was performed using SPSS 26.0, with p-values below 0.05 indicating significance.

Results

Out of the 50 patients included in this study, the distribution across gender, age, and procedural outcomes for the two techniques—Open (Hasson's) and Closed (Veress Needle)—are presented below.

Gender and Age Distribution

Both the groups were comparable in terms of age and

gender distribution highlighting the more prevalence of cholelithiasis in females of mean age around 40 years. There was no statistically significant difference among the two groups regarding age and gender distribution.

Table 1: Gender and Age Distribution of Study Population

Group	Male (%)	Female (%)	Mean Age (years)	Age Range (years)
Group 1 (Open technique)	12	88	40.80	20 – 62
Group 2 (Closed technique)	16	84	39.96	18 – 65
Total	14	86	-	18 – 65

Time Required to Achieve Pneumoperitoneum

Statistical analysis showed that Group 2 (Closed technique) required significantly more time to achieve pneumoperitoneum compared to Group 1 (Open technique) ($p < 0.001$).

Time Required for Wound Closure

The time taken for wound closure was significantly longer in Group 2 (Closed technique) than in Group 1 (Open technique) ($p < 0.001$).

Table 2 : Time Required to Achieve Pneumoperitoneum and for Wound Closure.

Group	Mean Time for Pneumoperitoneum (minutes)	Std. Deviation	Mean Time for Wound Closure (minutes)	Std. Deviation
Group 1 (Open technique)	4.96	1.06	4.82	0.74
Group 2 (Closed technique)	7.18	0.87	7.96	1.28
p-value	< 0.001 (significant)		< 0.001 (significant)	

Intra-operative Complications

Our study observed that there was no statistically significant difference between the two groups in the incidence of intra-operative complications like extra-peritoneal insufflation ($p = 0.312$), gas leakage ($p = 0.074$) and minor vessel injuries ($p = 0.297$).

Table 3: Incidence of Intra-operative Complications

Complication	Group 1 (Open technique)	Group 2 (Closed technique)	Statistical Significance (p-value)
Extra-peritoneal insufflation	0 (0%)	1 (4%)	0.312 (non-significant)
Gas leakage	3 (12%)	0 (0%)	0.074 (non-significant)
Minor vessel injury	3 (12%)	1 (4%)	0.297 (on-significant)

Post-operative Complications

It was observed in the present study that there was no significant difference regarding the incidence of post-operative complications like periumbilical hematoma ($p = 0.297$), port site infection ($p = 0.552$) or incisional hernia ($p = 0.312$) between the two groups.

Table 4: Incidence of Postoperative Complications

Complication	Group 1 (Open technique)	Group 2 (Closed technique)	Statistical Significance (p-value)
Port site infection	2 (8%)	1 (4%)	0.552 (non-significant)
Incisional hernia	1 (4%)	0 (0%)	0.312 (non-significant)
Periumbilical hematoma	3 (12%)	1 (4%)	0.297 (non-significant)

Discussion

Laparoscopic techniques have transformed surgical practice by offering reduced postoperative pain, quicker recovery, and fewer complications, such as wound infections and hernias, compared to open techniques[9]. However, approximately 50% of major laparoscopic complications occur during primary access for creating pneumoperitoneum, underscoring the critical nature of this initial step in laparoscopic procedures[10]. The creation of pneumoperitoneum, while essential, introduces hemodynamic and respiratory effects that require careful anesthetic management to minimize adverse outcomes[11]. Yet, iatrogenic injuries during this phase remain a significant concern, particularly in traditional closed methods, where the blind entry approach accounts for more than half of the related

injuries before anatomical dissection even begins[12-13].

In response to these complications, alternatives to the closed entry technique have been developed, including the open technique pioneered by Hasson, as well as direct trocar insertion, optical trocars, and expanding trocars[14-15]. Despite these advances, the Veress needle and Hasson techniques remain the most widely practiced, each with modifications designed to enhance safety and efficiency[16-17].

The time required to create pneumoperitoneum was notably different between the two techniques in this study. The mean time for the closed entry technique was significantly longer at 7.18 ± 0.87 minutes compared to 4.96 ± 1.06 minutes for the open technique. Similar findings were reported by Akbar et al[18]., who observed shorter access times for the open technique, as well as by Channa et al[19]., who found that the mean access time in the Hasson group (4.6 ± 1.1 minutes) was lower than that for the Veress needle (5.4 ± 0.7 minutes). Studies by Chotai et al[20]. and Jain et al[21]. have also demonstrated quicker access times with the open method, highlighting its efficiency compared to the closed approach. These time differences stem from multiple factors, including the routine performance of Veress needle entry tests, such as the suction-irrigation and saline drop tests, which prolong the closed entry process.

Closure time was also found to be shorter in the open technique due to the application of stay sutures, which facilitate efficient wound closure. Akbar et al[18]. similarly noted that wound closure time was significantly shorter for the open method, underscoring its procedural simplicity and potentially positioning it as a standard approach for such surgical procedures.

In terms of complications, both techniques exhibited strengths and weaknesses. Port site infections showed no significant difference between the two techniques, with two cases in the open group and one case in the closed group, aligning with findings from Abdullah et al[22]., who reported similar minor infection rates across both methods. Gas leakage was observed more frequently in the open technique, though this difference was not statistically significant. Parveen et al[23]. reported similar findings, with higher leakage rates in the open method, while Ali et al[24]. found rates of 2.91% in the closed method and 6.2% in the open method. However, advancements in insufflator technology, which provide high CO_2 flow rates, have mitigated these minor leaks without affecting overall procedural safety.

The incidence of extra-peritoneal insufflation was low across both groups, with only one case observed in the closed method. This outcome is consistent with studies by Chotai et al[20]., Ali et al[24]., and Perunovic et al[25]., which report low rates of extra-peritoneal insufflation in both open and closed techniques. These findings suggest that, with careful technique, both methods can be employed safely with minimal risk of extra-peritoneal insufflation.

Bowel injuries are a rare but serious complication of laparoscopic entry, and fortunately, no cases were reported in this study for either method. This finding aligns with previous studies by Chotai et al[20]. and Ali et al[24]., which also reported low incidences of bowel injuries. Other studies, such as those by Molloy et al[26]. and Chapron et al[27]., indicate a similarly low incidence of bowel injuries, further supporting the safety of both techniques when performed by experienced surgeons.

The lack of major vascular injuries in this study is encouraging, with only minor vessel injuries observed in three patients in the open group and one in the closed group. Studies by Molloy et al[26]. and Taye et al[28]. also support the open technique's safety profile concerning vascular injuries. However, the closed method has been associated with major vascular injuries, especially in less experienced hands, as Schafer et al[29]. found that major vascular injuries can occur even among highly skilled surgeons. Consequently, careful verification of needle placement is essential to minimize these risks. Additionally, Pickersgill et al[30]. and Chapron et al[27]. found higher rates of vascular injuries in the closed method compared to the open technique, suggesting that the open approach may offer a safer alternative in terms of major vascular protection.

Finally, this study found no cases of pneumoperitoneum creation failure in either group, which is consistent with findings by Akbar et al18.,

who reported no failures with the open technique. However, Ali et al[24]. noted a slightly higher failure rate with the Veress needle compared to the Hasson technique. The success rate of both methods in this study reinforces their suitability for laparoscopic entry.

In summary, this study demonstrated that both the open and closed techniques have unique benefits and risks. While the closed technique is associated with a slight increase in procedural time, the open method showed marginally lower complication rates and may be preferable for patients with a higher risk of vascular injury. Limitations of this study include its single-center design and relatively small sample size, which may impact the generalizability of the findings. Future studies across multiple centers and with larger samples are necessary to establish more definitive conclusions.

Conclusion

This study indicates that both the open (Hasson's) and closed (Veress needle) techniques are effective and safe for pneumoperitoneum creation in laparoscopic cholecystectomy, with the open technique offering a slight advantage in terms of reduced procedure time and minimal complications. While both methods are viable, the open technique may be preferable for reducing minor complications and ensuring safe entry, especially in patients with high-risk profiles. Further large-scale studies are needed to confirm these findings and provide additional insights into technique optimization.

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Case Report

COEXISTENT CELLULITIS AND MYOSITIS PRESENTING WITH LEFT ILIAC FOSSA PAIN

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Absract
Cellulitis is a bacterial skin infection affecting the dermis and subcutaneous tissues, while myositis is characterized by skeletal muscle inflammation. These are two different conditions which often occur independently. Their co-occurrence, however, poses diagnostic challenges due to overlapping symptoms and potential systemic complications. This report highlights the case of a 65-year-old female presenting with cellulitis and myositis. This case shows the diagnostic complexities which can occur and emphasizes the importance of a multidisciplinary approach.

Keywords
Cellulitis, Myositis, Idiopathic Inflammatory Myopathies, Polymyositis

Introduction

Cellulitis is a common bacterial condition involving the dermis and subcutaneous tissues, while myositis is a less frequent condition characterized by inflammation of skeletal muscle. Myositis can arise due to autoimmune causes, infectious causes or drug-induced causes. It is often associated with systemic diseases also. (1,3,6) The overlap between these conditions complicates diagnosis due to shared symptoms, including localized pain, swelling and inflammation. Diagnostic evaluations, including laboratory tests and imaging, play a crucial role in differentiating these conditions. (1,5) This case report explores the presentation, diagnosis, and management of a patient with coexisting cellulitis and myositis, highlighting the importance of timely intervention in achieving a favorable outcome.

Case Summary

A 65-year-old postmenopausal woman from Patiala presented to the emergency department on November 10, 2024, with acute pain localized to the left iliac fossa. The pain which began one day ago was accompanied by high-grade fever, chills, rigor and one episode of vomiting. The patient denied changes in bowel or bladder habits and reported normal stool patterns. Her medical history revealed no prior surgeries, chronic illnesses or any similar episodes in the past.

On examination, the patient was febrile but hemodynamically stable. Inspection of the abdomen revealed visible erythema over the left lower quadrant without scars, visible vessels or sinuses. Palpation confirmed tenderness, localized swelling and overlying warmth in the left iliac fossa. There was no crepitus or palpable lymphadenopathy. Gynecological examinations, including per speculum and per vaginal assessments revealed no significant findings.

Figure 1: Visible erythema seen in the lateral side of the abdomen in the left side.

Laboratory investigations revealed elevated inflammatory markers, with an erythrocyte sedimentation rate (ESR) of 120 mm/hour and a positive C-reactive protein (CRP). Imaging studies provided further insight. An ultrasound of the abdomen showed edema of the skin and subcutaneous tissues in the left inguinal region along with subcentimetric lymph nodes. A contrast-enhanced CT scan conducted on November 12 confirmed the presence of bulky and edematous abdominal muscles on the left side, with stranding in the surrounding subcutaneous fat. Enlarged lymph nodes were observed in the inguinal and para-aortic regions, the largest measuring 14.2 × 26.3 mm. The imaging findings were consistent with cellulitis and myositis.

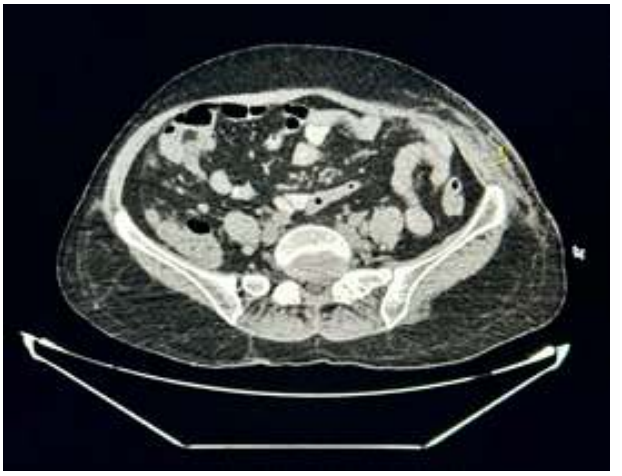

Figure 2: CT Scan image of the patient showing increased thickness of the anterior abdominal wall muscles in the left side (thickness of 1 cm marked in the image)

The patient was managed conservatively. She was administered intravenous antibiotics and analgesics, along with intravenous fluids to maintain hydration. Regular monitoring of her vital signs and inflammatory markers was conducted. The patient's condition gradually improved, with a marked reduction in abdominal tenderness and erythema.

Discussion

Cellulitis and myositis occurring together is a rare presentation and is quite a significant diagnostic challenge since the two have overlapping clinical features. Due to the similar presentation like local pain, erythema and swelling, and systemic evidence of inflammation including fever and elevated inflammatory indices. The pathophysiology of myositis involves complex interactions between immune cells and muscle tissues. In dermatomyositis, immune complexes and complement activation result in vascular damage, whereas in polymyositis and immune-mediated necrotizing myopathy, direct cytotoxicity mediated by T cells leads to muscle injury. (3,6) These processes are frequently compounded by systemic inflammation, as evidenced by elevated cytokines such as interleukin-6 and tumor necrosis factor-alpha, which also contribute to overlapping features with cellulitis. (3,6) The overlapping inflammatory and infectious profiles of cellulitis and myositis necessitate comprehensive diagnostic evaluations, including laboratory tests for creatine kinase (CK) levels and autoantibodies. (1,5,6) Management of coexisting cellulitis and myositis require a dual focus on infection control and inflammation. Standard treatment for cellulitis involves antibiotics, whereas myositis often necessitates immunosuppressive therapies, including glucocorticoids and methotrexate. (3,6) Recent advancements in biologic therapies targeting specific immune pathways, such as cytokines and B cells, offer promising alternatives for refractory cases. (3,6)

Imaging studies, especially CT scan, was central in assessing the extent of involvement and diagnosis. The management of these cases involves treating infection as well as controlling inflammation. For cellulitis, antibiotics remain the main mode of therapy, while for myositis, the use of immunosuppressive regimes including corticosteroids and Methotrexate is common. (3) In this case the patient's condition improved with intravenous antibiotics, demonstrating that the component of infection was the major pathology. Even so, it is important to observe for signs of progressive muscle involvement or the development of systemic complications because if diagnosis and/or treatment is not done in time, extreme situations such as sepsis or chronic damage to the muscles may occur. (5)

Accurate targeting of immune mediated processes with biologic therapies such as cytokine inhibitors and B-cell depletion therapies has provided some positive outcomes in cases of myositis that are resistant to conventional management. (3,6) Although they were not necessary in this instance, these are helpful options for patients who present with more severe or treatment resistant lesions.

Conclusion

This case highlights the diagnostic challenges associated with coexistent cellulitis and myositis. Early recognition, supported by detailed imaging and laboratory evaluations, facilitated an accurate diagnosis and effective conservative management. The patient's favorable outcome underscores the importance of timely intervention in preventing complications.

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Case Report

ANESTHETIC MANAGEMENT OF LARGE MULTINODULAR GOITRE POSTED FOR TOTAL THYROIDECTOMY : A CASE REPORT

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Abstract

The multinodular goitre presents as a swelling of neck and when it is enlarged enough it can distort the airways, produce pressure symptoms leading to a difficult airway. We are presenting case of successful anesthetic management in a woman with enlarged neck mass posted for total thyroidectomy.

KEY WORDS : multinodular goitre, total thyroidectomy, difficult airway, fiberoptic intubation

INTRODUCTION

The term "goitre" describes an abnormal swelling of the thyroid gland. The prevalence of goitre ranges from 80% in the iodine-deficient areas to 1-4% in the developed countries.[1] In India, the prevalence is around 12.2%.[2]Patients with large goiters pose a major challenge to anesthesiologists. Amathieu et al. reported that the overall incidence of difficult intubation in thyroid surgery was 11.1%.[3] In cases of large multinodular goiters, there is decrease in neck movements, reduced mouth opening, tracheal deviation, and compression. Fiberoptic intubation (FOI) has been used successfully in patients with enlarged thyroid in a difficult airway situation. We demonstrate one similar case of successful fiberoptic intubation in a 58-year-old female with large multinodular goitre with a challenging airway, where the airway was effectively secured with awake FOI.

CASE HISTORY

A 58 year old female presented with neck swelling (16 x 11 cm) since 14 years progressively increasing in size since two years, more on the right than the left. The neck swelling was associated with difficulty in swallowing, dyspnea on lying down and heat intolerance for 3-4 months.

On examination neck swelling was 16cm×11cm×10cm in size, with nodules, extending from hyoid bone above till sternal notch below and laterally from medial border of right sternocleidomastoid to the medial border of left sternocleidomastoid, moving with deglutition. On palpation, it was mobile and firm having multiple nodules and engorged veins were present over the swelling. No eye signs were present. Lymph nodes were not palpable. Airway examination revealed mouth opening of 1.5 finger breadths; large tongue; Mallampati grade 4, restricted neck extension, and severely limited neck flexion. [Figure 1]

Patient was taking Tab Carbimazole 5mg OD since 3 months and was euthyroid (TSH- 1 uIU/mL, T3- 10.30 ug/dL, T4-141 ng/dL).

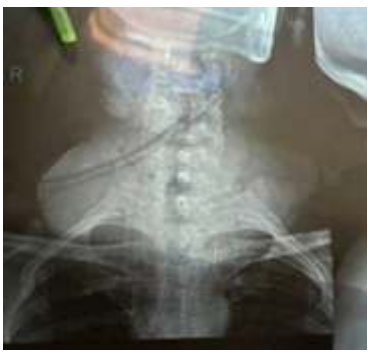
The ultrasonography of neck was indicative of massive swelling of thyroid with multiple nodules. FNAC (Fine Needle Aspiration Cytology) was done and colloid goitre with cystic change was seen.

Patient was diagnosed as a case of multinodular goitre and was posted for total thyroidectomy.

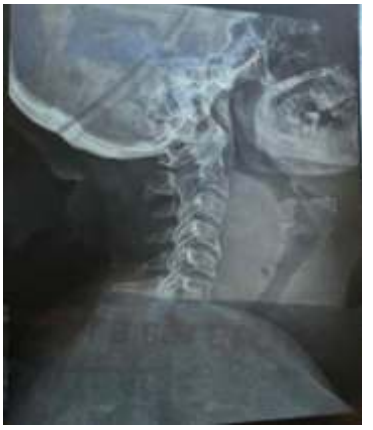
On general examination, patient was obese (BMI-32.1 kg/m2) with Blood pressure- 130/85 mmHg, Pulse rate- 75/min. All the routine investigations were done.

Indirect laryngoscopy was done by

otolaryngologist which revealed overhanging epiglottis, anteriorly placed right-sided arytenoid, and vocal cords were not visualized. Chest X-ray showed no retrosternal extension or deviation of the trachea [Figure 2, Figure 3]. Radiological examination revealed diffuse bulky thyroid gland (15.9x10.9x9.4 cm) with no obvious retrosternal



extension, mild compression of the esophagus with normal airway and mediastinal structures.



Awake fiberoptic intubation was planned and procedure was explained to the patient. Written informed consent was taken.

On the day of surgery, after confirmation of fasting status, the patient was given Injection Glycopyrrolate 0.2 mg intramuscular) 30 min before surgery. Nebulization with 4ml of 4% Lignocaine was done and Xylometazoline drops given nasally.

After shifting the patient to the operation theatre, multipara monitors were attached. Baseline values noted. Nasal airway inserted and paraoxygenation started. Lignocaine 10% atomizer spray was used on the pharynx. Minimal sedation was given using 0.5 mg Injection Midazolam and 50 ug injection fentanyl IV so that patient could co-operate with awake procedure.

The patient was made to lie in the semirecumbent position at 30° angle. Cuffed ETT (Endotracheal tube) No. 7.0 was loaded on the fiberoptic bronchoscope (FOB) after lubrication of the scope. FOB was introduced into the nasal cavity and pharyngeal structures visualized which were severely crowded. The epiglottis was seen to be large and overhanging [Figure 4]. As the laryngeal inlet was approached, converging of false vocal cords could be seen. Topical anesthesia with 2 ml of Injection Lignocaine 4% was given to prevent reflexes using "spray as you go" technique through drug channel of FOB. True vocal cords could be seen , another aliquot of 2 ml of injection lignocaine 4% was given at this point. After crossing the vocal cords (subglottic area) another 2 ml aliquot. 4th aliquot administered after visualizing the carina [Figure 5] (tracheal).

ETT was introduced into the trachea by railroading

along fiberscope and placed above the carina. FOB was removed. Correct placement of the tube in the trachea was confirmed by checking end-tidal carbon dioxide (EtCO2) and bilateral air entry on auscultation. Cuff was inflated and the tube was secured. Injection propofol 150 mg intravenous (I.V.), injection fentanyl 50 mcg I.V., and injection vecuronium bromide 5 mg I.V. were administered. Anesthesia was maintained with O2, N2O, isoflurane, and maintenance doses of vecuronium bromide 1 mg every 30–40 min. The patient was monitored for pulse rate, blood pressure, ECG, pulse oximetry and EtCO2. The patient was hemodynamically stable throughout surgery.

Postoperatively, the patient was shifted to Intensive Care Unit. After 24 h, leak test was performed which was negative. The patient was fully awake, oriented and hemodynamically stable. Trachea was extubated using AEC (airway exchange catheter) after adequate oropharyngeal suctioning. AEC was used due to the fear of airway obstruction in the post-operative period. [Figure 6].

AEC was removed after 24 hours and patient was shifted to ward on post-operative day two with stable vitals.

DISCUSSION

Massive thyroid swellings pose a major challenge to anesthesiologists. Bouaggad et al. in their study have reported that there is increased incidence of difficulty in endotracheal intubation with tracheal deviation, compression, presence of dyspnea, Mallampati Grading III and IV, and neck mobility <90°.4 Various techniques can be used to manage difficult airway in patients with goitre. If thyroid swelling is small with normal airway examination and without any evidence of tracheal deviation/compression, we can proceed for a conventional airway management.

In this case, we did not plan a direct laryngoscopy in view of difficult mask ventilation and intubation due to obesity, decreased mouth opening, large tongue, Mallampati Grade IV, large goiter causing decreased neck movements and dyspnea on lying down indicating tracheal compression. Hence, we opted for awake fiberoptic intubation. We did not plan tracheostomy in our case due to large swelling obscuring the trachea. It is mentioned in literature that tracheostomy is difficult to perform in the presence of large and vascular thyroid gland. FOI has been suggested for the airway management in patients with challenging airways as it can quickly and safely secure the airway.

CONCLUSION

Patients with large neck swelling present a unique set of challenges for the anesthesiologist. A multidisciplinary team approach including the surgeon, anesthesiologist and endocrinologist allows safe and effective management. Appropriate preoperative planning, assessment, effective communication with patients and preparation for airway management is essential for better patient outcomes.

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Case Report

SPINDLE CELL TUMOUR AS NASAL MASS -A RARE CASE REPORT

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ABSTRACT

We report a rare case of a spindle cell tumor presenting as a nasal mass. Spindle cell tumors are rare, mesenchymal or epithelial tissue-originating neoplasms, typically affecting the skin, subcutaneous soft tissues, calcaneus, and breast. Nasal involvement is exceedingly rare. Our patient presented with a nasal mass, and radiology aided in detection. However, the tumor's nature remained unclear until surgical excision. This case highlights the diagnostic challenges and importance of considering spindle cell tumors in the differential diagnosis of nasal masses.

Keywords: Spindle cell tumor, nasal mass, rare case report, diagnostic challenges.

INTRODUCTION:

Rare tumors known as spindle cell tumors were initially described by Weiss and Enzinger in 1896.[1] Tumors with spindle cell characteristics can have a long or short spindle shape and vary in length.[2] Tumors tend to originate from mesenchymal or epithelial tissues and are most commonly found in the skin, subcutaneous soft tissues, calcaneus, and breast.[3,4]

Environmental and genetic factors may contribute to the development of spindle cell tumors while the exact cause is unknown. The dermis and subcutis of the distal extremities are mainly affected by the spindle cell tumors, and nasal cavity is rarely affected. Symptoms depend on the size and position of the tumor. When the nasal spindle cell tumors reach a certain size, they present the symptoms according to the involved site, and the nature of the tumor cannot be defined precisely before the surgery. The location and boundaries of the tumors can be detected using radiology. As per the radiological findings a surgical approach may be planned preoperatively. Differential diagnosis and treatment strategies can be made with the help of histopathology.[5]

CASE REPORT:

A 30-year-old female presented to Ent OPD with swelling right nasomaxillary groove and nasal obstruction for 5 months.

Anterior rhinoscopy revealed a mass completely blocking nasal cavity. Oral cavity and oropharynx examination was normal with no significant lymphadenopathy. (figure 1)

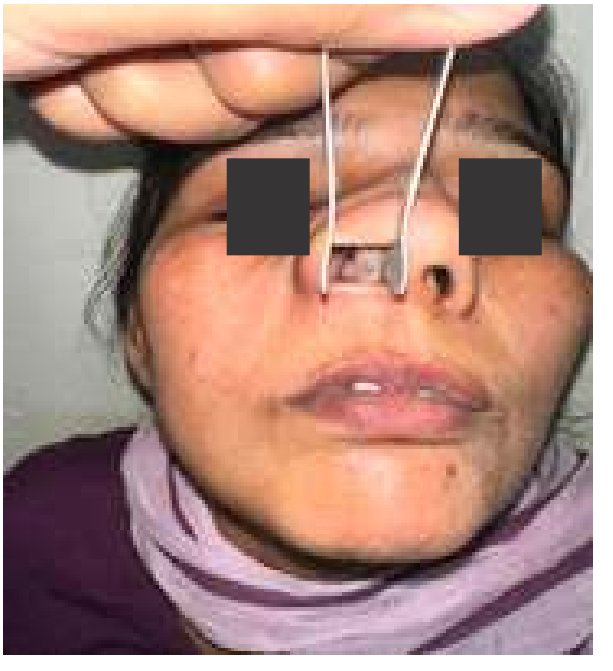

Figure 1- Pre operative clinical appearance

A non contrast enhanced computed tomography scan (NCCT) of nose and paranasal sinuses was

performed to know extent and characteristics of lesion. On NCCT soft tissue density mass of size approximately 4 cm into 3 cm was seen in right nasal cavity. (figure 2a,2b)

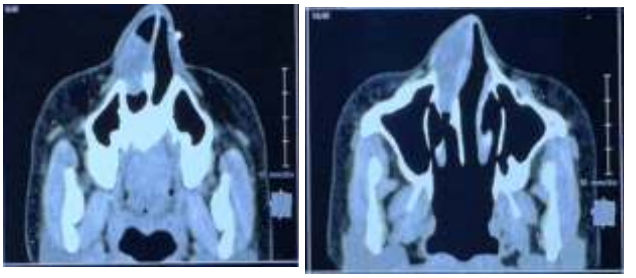

Figure 2a,2b-NCCT Nose and paranasal sinuses

Patient underwent endoscopic excision of mass under general anaesthesia.

Mass was approximately 4 cm into 3 cm, polyploidal in nature with greyish brown to whitish in colour attached to right nasal septum.(figure 3)

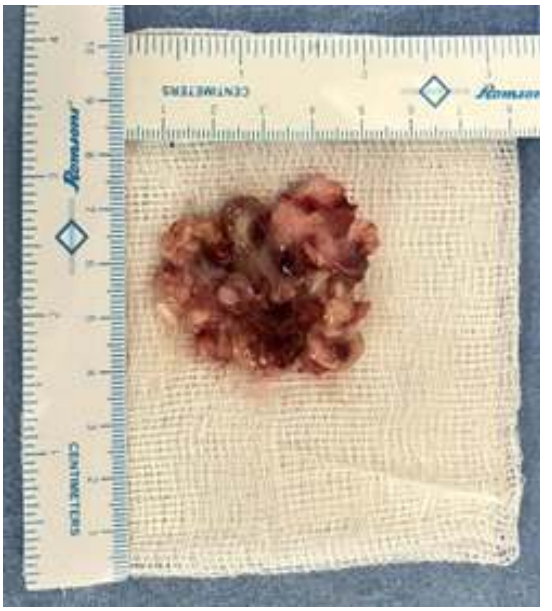

Figure 3 Gross tumour appearance

Post operative histopathological findings show interlacing fascicles of benign appearing spindle cells that have ovoid to spindle shaped nuclei with blunt ends; suggestive of benign spindle cell lesion.

Routine follow up after 1 month showed no recurrence.

DISCUSSION:

These are a class of tumors distinguished histologically by a combination of spindle cells and fibroblasts within a collagen and mucinous matrix. Furthermore, these tumors are uncommon and can develop in soft tissues, bones, or any other part of the human body. For example, they can appear as spindle cell carcinoma or squamous cell carcinoma in epithelial tissues, or they can manifest as spindle cell sarcoma or stromal sarcoma in mesenchymal tissue. Consequently, based on their morphological appearance, they may be a tumor or a carcinoma.[6]

Based on the location and size of the tumor the spindle cell tumors primarily present as nonspecific olfactory disorders, localized pain, and progressive unilateral nasal congestion, nasal obstruction and bulging, which are based on the location and size of the tumor. The tumor's considerable size and its tendency to compress surrounding tissue may mimic malignant features. [7]

The category of spindle cell tumors include a wide range of both benign and malignant tumors, originally from neural, fibroblastic, vascular, myofibroblastic, myogenic, and epithelial tissues. The following histological patterns can be seen in head and neck tumors made primarily of spindle cells: monomorphic, biphasic, pleomorphic Malignant Fibrous Histiocytoma or myxoid.[8]

In order to classify the differential diagnosis of these lesions and enable more focused application of molecular and immunohistochemical techniques, histopathology is important. A broader panel of antibodies is said to help narrow down the immunohistochemical diagnosis; however, financial constraints limit the number of antibodies that can be tested in each case.[9]

CONCLUSION:

We are reporting a rare case of nasal spindle cell lesion. Because nasal spindle cell tumors are uncommon, more cases must be reported before a prognosis can be established. Immunohisto-chemistry is necessary for accurate diagnosis. Endoscopics nasal resection of spindle cell tumors is a safe and efficient procedure.[7]

DECLARATION: The authors have no competing interests to declare that are relevant to the context of this article. The authors have no relevant financial or non-financial interests to disclose.

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32.	LM/G-5/2021	Dr. Gurjit Singh Gandhi - Anesthesia
33.	LM/G-6/2021	Dr. Gurlivleen Kaur - Anesthesia
34.	LM/H-I /2016	Dr. H S Rekhi - Surgery
35.	LM/H-2/2016	Dr. Hari Om Aggarwal - Orthopedics
36.	LM/H-3/2017	Dr. Harsimarjit Kaur - Anatomy
37.	LM/H-4/2019	Dr. H K S Chawla - Orthopedics
38.	LM/H-5/2021	Dr. Harjinder Singh - Urology
39.	LM/H-6/2021	Dr. Harbhupinder Singh - Urology (LM/G-6/2021)
40.	LM/J-1/2021	Dr. Jaswinder Singh - Surgery
41.	LM/K-1/2016	Dr. Kanchan Bhardwaj - Transfusion Medicine
42.	LM/K-2/2016	Dr. K K Aggarwal - Forensic Medicine
43.	LM/K-3/2017	Dr. Kuldeep Garg - Plastic Surgery (Couple P-3)
44.	LM/K-4/2017	Dr. Kuldeep Singh Bhatia - Surgery
45.	LM/K-5/2021	Dr. Kuldeep Singh Sandhu - Ortho
46.	LM/L-1/2021	Dr. Lalit Kumar - Anesthesia (Couple- A-8)
47.	LM/M-1/2016	Dr. Maninder Kaur - Biochemistry

48.	LM/M-2/2016	Dr. Mohanvir Kaur - Hematology
49.	LM/M-3/2017	Dr. Manoj Mathur - Radiology
50.	LM/M-4/2017	Dr. Manjit Kaur Mohi - Gynae
51.	LM/M-5/2017	Dr. Manpreet Kaur - Gynae
52.	LM/M-6/2017	Dr. Manjit Singh - ENT
53.	LM/M-7/2020	Dr. Manpreet Kaur Walia - Eye
54.	LM/M-8/2021	Dr. Mandeep Kaur - Anaesthesia
55.	LM/M-9/2021	Dr. Manju Bala - Anatomy
56.	LM/N-1/2017	Dr. Navneet Kaur - Pathology
57.	LM/N-2/2020	Dr. Neeraj Mittal - Psychiatry
58.	LM/N-3/2021	Dr. Neeru Bedi - Radiation Oncology (Couple - LM/P-9/2021)
59.	LM/N-4/2021	Dr. Neetu Sharma - Pharmacology
60.	LM/N-5/2021	Dr. Navneet Kaur - Gynae & Obs.
61.	LM/P-1/2016	Dr. Preet Kanwal Sibia - Gynae. & Obs. (Couple R-3)
62.	LM/P-2/2016	Dr. Puneet Gambhir - Community Medicine (Couple S-1)
63.	LM/P-3/2017	Dr. Parveen Mittal - Pediatrics
64.	LM/P-4/2017	Dr. Paras Pandove - Surgery
65.	LM/P-5/2017	Dr. Prem Chand Singla - Surgery
66.	LM/P-6/2020	Dr. Parneet Kaur - Gynecology
67.	LM/P-7/2020	Dr. Preetinder Singh Chahal - Forensic Medicine
68.	LM/P-8/2021	Dr. Parmod Kumar - Anesthesia
69.	LM/P-9/2021	Dr. Parvinder Singh - ENT
70.	LM/R-1/2016	Dr. Rajni Bassi - Transfusion Medicine
71.	LM/R-2 /2016	Dr. Rupinder Kaur Bakshi - Microbiology
72.	LM/R-3/2016	Dr. R P S Sibia - Medicine
73.	LM/R-4/2016	Dr. Rajan Singla - Anatomy
74.	LM/R-5/2020	Dr. Rajesh Kumar Badhan - Radiology (Couple S-9)
75.	LM/R-6/2021	Dr. Ranjana - Pharmacology
76.	LM/R-7/2021	Dr. Raja Paramjeet Singh Benipal - Radiation Oncology
77.	LM/R-8/2022	Dr. Ravisha Bhardwaj - Orthopedics
78.	LM/S-1/ 2016	Dr. Saryu Gupta - Radio diagnosis
79.	LM/S-2/2016	Dr. Sarabjit Kaur - Gynecology
80.	LM /S-3/2017	Dr. Seema Goyal - Skin
81.	LM /S-4/2017	Dr. Sanjay Goyal - Medicine
82.	LM/S-5/2017	Dr. Sanjeev Bhagat - ENT
83.	LM/S-6/2017	Dr. Sangeeta Aggarwal - Gynae (Couple-H2)
84.	LM/S-7/2017	Dr. Shelly Jetly - Transfusion Medicine
85.	LM/S-8/2020	Dr. Satinder Pal Singh - Forensic Medicine
86.	LM/S-9/2020	Dr. Sudesh Kumari - Chest & TB
87.	LM/S-10/2021	Dr. Satinder Pal Kaur - Obs. & Gynae.
88.	LM/S-11/2021	Dr. Sanjeev Gupta - Surgery
89.	LM/T-01/2021	Dr. Tripat Kaur - Anesthesia
90.	LM/T-02/2022	Dr. Tanveer Singh Kundra - Anesthesia
91.	LM/ V-1/2016	Dr. Vishal Chopra - Chest & TB
92.	LM/V-2/2016	Dr. Vinod Dangwal - Radiotherapy
93.	LM/V-3/2016	Dr. Vijay Bodal - Pathology (Couple S-2)
94.	LM/V-4/2016	Dr. Vijay Sehgal - Pharmacology
95.	LM/V-5/2017	Dr. Vandna Singla - Clinical Pathology

Format of Application for Membership

To
The Editor
Journal Club Government Medical College Patiala Punjab India

Dear Sir/Madam

I wish to become a Life Member/Annual Member of the Journal Club GMC Patiala. I am furnishing the required particulars below with a request to enroll me in the Journal Club.

The fee of Rs. 5000/ Rs. 8000/- Rs 1000/- for Life Membership (Single/Couple)/ Annual Membership is enclosed as a Demand Draft/ Cheque with No._____of _____Bank, in the name of Journal Club Government Medical College Patiala along with my two passport size photographs.

I have gone/will go through the rules and regulations of the Journal Club and I agree to abide by the same.

PARTICULARS

1. Full name (in block letters)
2. Father's/Husbands' name
3. Qualification
4. Official Designation & Place of Posting
5. Permanent Address
6. Phone No. & Email

Place Yours Sincerely

Date (Signature)

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GMC Patiala Journal of Research and Medical Education

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N,B. This is the permanent page for the Founder Team (Editorial Board)