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Emergency obstetric hysterectomy in the era of rising caesarean sections

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ABSTRACT

Objective. Emergency obstetric hysterectomy (EOH) is a life-saving procedure when all other measures fail to control haemorrhage in obstetric emergencies. Our hospital based retrospective study aims to evaluate the incidence, demographic profile, risk factors, clinical indications, and outcomes associated with EOH.

Materials and Methods. A retrospective analysis was conducted encompassing 34 cases of EOH out of 12,782 deliveries within a duration of 4 years and 2 months. Variables examined included maternal demographics, obstetric history, surgical indications, perioperative complications, maternal and foetal outcomes.

Results. The incidence of EOH was 0.26% (1 in 376 deliveries). The median maternal age was 31 years, with multigravida status in 85.3% of cases. A history of caesarean section was documented in 76.5%, and placenta previa in 44.1%. PAS constituted the leading indication (58.8%) for EOH, followed by atonic postpartum haemorrhage (20.6%) and uterine rupture (20.6%). Primary mode of delivery was caesarean section in our cases (82.3%). Postoperative intensive care was required in 88.2% of cases, with major complications comprising anaemia (70.6%) followed by haemorrhagic shock (29.4%). Maternal mortality was observed in 5.8% of cases and foetal mortality predominantly was attributed to prematurity, with neonatal survival in 67.6% cases.

Conclusions. EOH remains indispensable for life-threatening obstetric emergencies. The predominance of PAS underscores the necessity for judicious use of caesarean section. Enhanced antenatal risk stratification and robust tertiary support infrastructure, including rapid-access blood bank and intensive care facilities, will help to optimize maternal and neonatal outcomes.

INTRODUCTION

Emergency obstetric hysterectomy is a vital procedure to save life of a mother during obstetric emergencies although it is opted as a desperate and last resort when all other measures fail to control catastrophic haemorrhage. Severe antepartum and postpartum haemorrhage (PPH) is a major cause of maternal mortality and morbidity and is increasing in incidence worldwide [1-3]. According to recent

reports, 0.20 to 5.09 of every 1,000 postnatal women across the globe have undergone an emergency hysterectomy. Many reports have listed placenta accreta, uterine atony and uterine rupture as common indications necessitating emergency hysterectomy [4, 5]. There is enormous increase in number of caesarean deliveries in the recent times with rise in its long-term sequelae like abnormal placentation and uterine ruptures leading to increase in number of EOH. Patients who undergo EOH, require close monitoring in the post-operative period to prevent further post-operative complications such as wound infection, renal failure, disseminated intravascular coagulation (DIC), shock, septicaemia and mortality [6]. Thus, increase in incidence of EOH require utmost attention.

This study aimed to evaluate the incidence, demographic profile, risk factors, clinical indications, and outcomes associated with EOH in a tertiary care referral hospital in Delhi.

MATERIALS AND METHODS

Study setting

The present hospital-based retrospective study was conducted in the Department of Obstetrics and Gynaecology, ESI Hospital Basaidarapur, New Delhi. It is the major government referral centre as well as a teaching and training institute in North-West part of Delhi, India.

Study population

All cases of emergency obstetric hysterectomy (EOH) between Jan 2021 and March 2025 were included after fulfilling inclusion and exclusion criteria. EOH is defined as a hysterectomy done during pregnancy and within six weeks of delivery.

Inclusion criteria

- All women who delivered in the hospital during study period and underwent emergency hysterectomy for obstetric indications during pregnancy or at the time of delivery or subsequently within the defined period of puerperium (42 days).
- All women with obstetric complications of pregnancy including Molar pregnancy, ectopic pregnancies, abortions.
- The women who delivered outside the study hospital and were referred for obstetric complications fulfilling the above conditions.

Exclusion criteria

Women who underwent hysterectomy for gynaecological reasons (*e.g.*, sterilization or cancer) or outside the stipulated time of 42 days post-delivery were excluded from the study.

Data collection

Data were collected retrospectively from Jan 2021 to March 2025 from the central record section of ESI Hospital Basaidarapur, Delhi and subsequently all the data were reviewed and analysed in detail. Extracted information from medical records included:

1. Socio-demographic characteristics (age, booking status)
2. Obstetric history (parity, previous deliveries)
3. Mode of delivery (vaginal or caesarean and their indications)
4. Clinical indicators [uterine rupture, intractable PPH, Placenta accreta spectrum (PAS)]
5. Post-operative complications *e.g.* anaemia, bladder and ureter injury, shock, sepsis, disseminated intravascular coagulation (DIC), wound infection, acute kidney injury (AKI)
6. Maternal morbidity and mortality and neonatal outcome.

We found a total of 12782 deliveries in the selected time frame. Out of these, 6239 deliveries were Caesarean sections and 6543 were vaginal deliveries. Emergency obstetric hysterectomy (EOH) was performed in 34 patients.

Data analysis

The collected data of these 34 EOH deliveries was entered into the predesigned working proforma. All the information extracted was filled onto the Microsoft Excel Spreadsheet, and analysed by simple descriptive statistics performed, using IBM SPSS Version 25.0 (IBM Corp., Armonk, NY, USA) and described with the help of tables. Mean as well as standard deviation were used for categorical data and percentages were used for continuous variables. The main focus was kept on indications and surgical outcomes of EOH.

RESULTS

During the study period out of total 12,782 deliveries, 6,239 (48.8%) were caesarean deliveries and 6,543 (51.2%) were vaginal deliveries. A total of 34 emergency obstetric hysterectomies were carried

Table 1. *Socio-demographic characteristics.*

Maternal factors	Numerosity (n = 34)	Percentage
Age	Mean- 30.97; Median-31 (SD-5.408)	
Registration status		
Registered in other centres	11	32.35%
Registered in study hospital	19	55.88%
Unregistered	4	11.77%
Referral		
Referred from other hospital	15	44.1%

Table 2. *Distribution of cases by age and parity.*

Age(years)/ parity	P1	P2	P3	P4	P5 or >5	Total
< 25	0	2	1	0	0	3
25-30	2	6	2	3	0	13
31-35	0	2	9	1	0	12
> 35	3	2	0	0	1	6
Total	**5**	**12**	**12**	**4**	**1**	**34**

Table 3. *Obstetric history.*

Caesarean	n	%
Previous nil caesarean	8	23.5%
Previous 1 caesarean	16	47.1%
Previous ≥ 2 caesarean	10	29.4%

Table 4. *Mode of delivery.*

Delivery	n	%
Vaginal	2	5.9%
Caesarean	28	82.3%
Other causes	4	11.8%

Table 5. *Various indications for emergency obstetric hysterectomy*

Indication	Number	Percentage (%)
Morbidly adherent placenta/placenta accreta spectrum (PAS)	20	59%
Atonic uterine PPH	7	20.5%
Uterine rupture	7	20.5%
Placenta accreta spectrum	20	59%
Post caesarean	17	-
APH with placenta previa	15	-
APH without placenta previa with focal accreta	1	-
Rupture uterus	7	20.5%
Dehiscence of the previous scar	3	-
During evacuation of products of conception	4	
PPH	7	20.5%
Atonic	6	-
Associated with uterine Inversion	1	-
Associated with anaemia before PPH (mild/mod/severe)	5	-

PPH: post-partum haemorrhage; APH: antepartum haemorrhage.

out during this period, with the overall incidence of 1 in 376 deliveries, *i.e.* 0.26%.

Out of 34 patients, minimum age was 22 yrs and maximum was 43 yrs. Median age was 31 yrs. Only 4 (11.7%) were between 20-24 years of age, followed by 12 (35.3%) between 25-30 years and 12 (35.3%) between 31-35 years and 6 (17.6%) were more than 35 years. The majority of women (25) were in the age group of 25 to 35 years. They constituted over 73.53% of cases.

Our is a referral hospital where all complicated obstetrics case are referred from other hospitals of Delhi (**Table 1**).

Out of all, 35.3% are of parity 2 and 50% of parity ≥ 3. Only five (14.7%) primigravida women were encountered during our study period (**Table 2**).

Out of the 34 cases, 13 (38.2%) patients were full term, *i.e.* > 37 weeks of gestation and 17 patients (50%) were preterm but crossed age of viability, *i.e.* > 28 weeks till 36 weeks. Four obstetric hysterectomies (11.8%) performed during evacuation of products of conception/abortions.

Table 3 demonstrates obstetric history of the 34 cases, with only 8 cases having no history of previous caesarean section. Rest 26 with prior caesarean deliveries of which 1 had previous classical caesarean with history of previous 3 caesarean section.

Amongst the 34 patients who underwent obstetric hysterectomy, 2 had EOH performed post vaginal delivery, 28 had EOH performed post caesarean section. Four had EOH performed due to other reasons: 1 patient had molar pregnancy of less than 12 weeks and rupture during evacuation done outside hospital, 1 had ruptured uterus in a case of septic abortion while undergoing removal of products of conception, 1 was a ruptured scar ectopic and 4th was a case of ruptured cornual ectopic pregnancy with uterus damaged beyond repair (**Table 4**).

The most common indication for EOH in present study was placenta accreta spectrum (PAS) which accounted for 20 cases (placenta accreta: 17 cases (50%), placenta increta: 2 cases (5.9%), placenta percreta: 1 case (2.9%)), followed by 7 EOH done due to intractable atonic PPH and 7 hysterectomies were

Table 6. *Risk factors for major conditions necessitating emergency obstetric hysterectomy.*

Risk factor	Indication			Total number	Percentage
	PAS	PPH	Uterine rupture		
Prev 1 CS	10	2	4	16	47 %
Prev ≥ 2 CS	7	0	3	10	29.4 %
Placenta previa	12	0	3	15	44.1 %
Placental Abruption	1 (Focal)	1	0	2	5.9 %
Malpresentation/Malposition	2	2	1	4	11.8 %
History of D&C	1	0	1	2	5.9 %
Uterine inversion	0	1	0	1	2.9 %
Septic abortion	0	0	1	1	2.9 %
Hydatidiform mole with previous LSCS	0	0	1	1	2.9 %
Anaemia	2	5	0	7	20.6 %
HTN disorder of pregnancy	1	2	0	3	8.8 %
Twin pregnancies	0	3	0	3	8.8 %
No identifiable risk factor	0	1	0	1	2.9 %

CS: caesarean section; D&C: dilation and curettage; LSCS: lower segment caesarean section; HTN: hypertension.

Table 7. *Perioperative complications.*

Complications	Numerosity (n = 34)	Percentage
Pre-existing co-morbidities		
Anaemia	7	20.6%
GDM	2	5.9%
Hypertension disorders	3	8.8 %
Others	18	52.9 %
Intra-op complications		
Bladder injury	2	5.9 %
Post-op complications		
Anaemia	24	70.6%
Shock	10	29.4%
Wound infection	5	14.7%
DIC	4	11.8%
Septicaemia	2	5.8%
Others (ARF, hepatic encephalopathy, psychosis)	4	11.8%
Duration of hospital stay (days)	Mean = 9.89 ± (SD = 3.956)	

n: total number of cases; GDM: gestational diabetes mellitus; DIC: disseminated intravascular coagulation; ARF: acute renal failure.

done due to uterine rupture seen in patients with damage exceeding possibility of repair (**Table 5**).
Out of EOH in 2 normal vaginal delivery, one had PAS with excessive bleeding and other had PPH following uterine inversion post home delivery and improper reposition followed by haemorrhagic shock.
Regarding predisposing risk factors responsible for EOH, prior caesarean section was observed in 26/34 cases (76.5%) (**Table 3**).
Patients who underwent EOH, association with Placenta previa was seen in 15/34 (44.1%) cases, out of which 5/15 were placenta previa seen in previous 1 Lower segment caesarean section (LSCS), 7/15 in previous 2 LSCS and 1/15 was placenta previa in classical C section, 2/15 had no prior C sections. Out of 15 placenta previa, 10 had antepartum haemorrhage.
Previous caesarean section was significantly associated predisposing factors with PAS and uterine rupture. The other high-risk factors were multiple pregnancy, obstructed labour with multiparity, HTN/ Preeclampsia and prolonged labour and these were more associated with PPH (**Table 6**).
In two cases of PPH, obstetric hysterectomy was done 12 hrs past LSCS due to intractable PPH of unknown cause. Three cases of PPH happened in elderly primigravida and known case of hypertensive disorder in pregnancy with twin conception via *in vitro* fertilization (IVF) in study hospital.
In present study 30 patients (88.2%) required Intensive Care Unit (ICU) care, post obstetric hysterectomy for stabilization. Most patients (24, 70.6%) had excessive blood loss during surgery requiring critical care monitoring, fluid management and blood products. Anaemia was the most common post-operative complication followed by haemorrhagic shock. **Table 7** lists other complications observed in intra and post-operative period.
There were 2 maternal mortalities observed (5.8%) in the present study, both due to post-partum haemorrhage leading to haemorrhagic shock followed

Table 8. *Maternal mortality and associated factors, and foetal outcomes.*

Mother outcomes			
Cases	**Indication of EOH**	**Cause of death**	**Admission to death duration**
1	Atonic PPH with Uterine inversion	PPH with septic shock, with DIC and MODS	Within 10 days of ICU stay
2	PPH with hemoperitoneum	PPH with impending eclampsia with AKI, DIC with MODS	Within 48 hours
Foetal outcomes			
	n	**%**	
Live (single)	20	58.8%	
Live (twins)	3	8.8%	
IUD/ early neonatal death	7	20.6%	
Non-viable Pregnancy	4	11.8%	

EOH: emergency obstetric hysterectomy; PPH: postpartum haemorrhage; DIC: disseminated intravascular coagulation; MODS: multiple organ dysfunction syndrome; AKI: acute kidney injury; IUD: intrauterine death.

by DIC and Multiple Organ Dysfunction Syndrome (MODS), leading to death. Out of these 2 mortalities, one patient had vaginal delivery with uterine inversion, and other had LSCS delivery due to Footling breech and intractable PPH in post op period, of unknown aetiology (**Table 8**).

Regarding foetal outcome, most babies were born alive, 20 singleton and 3 twins (67.65%). 7 (20.6%) mortalities amongst newborns were primarily because of prematurity and related complications (**Table 8**).

DISCUSSION

Emergency obstetric hysterectomy (EOH) remains a critical intervention to manage life-threatening obstetric haemorrhage not responding to any other measures. Though EOH is rarely performed, its implications in dire obstetric conditions on maternal morbidity and mortality are substantial.

Incidence

Out of 12,782 total deliveries during the study period, 34 EOHs were performed, giving an incidence rate of 1 in 376 deliveries (0.26%). This is consistent with reported EOH incidence rates in developing countries, which vary between 0.2% to 0.8% depending on institutional protocols and referral patterns [7, 8]. In India, the studies have shown a range between 0.2 and 2.0 per 1,000 deliveries, with higher frequencies seen in high-volume institutions handling complicated referrals [9]. The increase in EOH is closely tied to the rise in caesarean delivery rates, with prior LSCS found to be a critical risk factor in nearly 70-80% of EOH cases [10-12]. Notably, 48.8% of total deliveries (12,782) in our study period were caesarean sections, reflecting the ongoing rise in caesarean rates in India, which significantly contributes to the growing burden of abnormal placentation disorders.

Demographic characteristics

The age of the study population ranged from 22 to 43 years, with a median age of 31 years. The majority (70.6%) were between 25 and 35 years of age, which aligns with the reproductive peak and is similar to other institutional reports [12, 13]. Only 11.7% of cases involved women younger than 25 years, while 17.6% were over 35, indicating that maternal age is not the sole determinant of EOH risk.

A strong association with higher parity was evident and 85.3% of patients were of parity 2 or above, with a substantial proportion being grand multiparas. This reinforces findings from previous studies linking increasing parity with uterine rupture and placenta accreta spectrum (PAS) disorders [12-15].

Antenatal registration and referral status

The study revealed that 32.35% of the EOH cases were referrals from peripheral hospitals, highlighting the tertiary hospital's role as a referral centre for complicated obstetrics cases. EOH is often a reflection of deeper issues within the healthcare system in obstetric management, particularly within referral-based tertiary care hospitals [17]. Additionally, 11.8% of the patients were unregistered antenatally. Unregistered pregnancies often lack surveillance in antenatal period and timely risk stratification, contributing to obstetric emergencies. Antenatal care offers a critical opportunity to identify high-risk conditions such as placenta previa, PAS, and hypertensive disorders [16]. Moreover, a good antenatal care and early recognition of such high-risk factors provide for timely referral and management at higher tertiary centres, thereby reducing maternal morbidity associated with it and obstetric hysterectomy.

Gestational age and timing

Most EOHs occurred beyond foetal viability: 38.2% at term (> 37 weeks) and 50% preterm (28-36 we-

eks), while 11.8% occurred while removing the products of conception. This reflects that EOH most often arises in third trimester or peripartum period, when complications such as morbidly adherent placenta or uterine rupture are more likely [16].

Obstetric history and EOH

Out of 34 patients, 76.5% patients had a history of previous caesarean section. The clear predominance of previous caesarean section prior to EOH demonstrates the shifting pattern of EOH indications from uterine rupture and atonic PPH to morbidly adherent placenta, which is known to follow caesarean-induced uterine scarring [18]. 23.5% of patients in the study had no previous history of caesarean section. Out of these, 2 patients underwent vaginal deliveries. Associated with PAS in one case and uterine inversion with PPH following home delivery in other case were the reason for EOH. These cases emphasize the importance of antenatal surveillance and institutional delivery.

Indications for obstetric hysterectomy

The leading cause of EOH in our study was Placenta Accreta Spectrum (PAS) (58.8%), including accreta (50%), increta (5.9%), and percreta (2.9%). This shift from uterine rupture and atonic PPH as historical leading causes reflects the growing burden of PAS globally. PAS was the indication in over 50-60% of hysterectomy cases in multiple regional reports [19]. Kastner *et al*. analysed 47 cases from 1991 to 1997, with placenta accreta accounting for 48.9% of the cases; 51.1% of the women in their study had a previous caesarean delivery [20]. Zelop *et al*. analysed adherent placentation accounting for 64% of the cases: 59.8% had a previous caesarean delivery [21]. An analysis of patient discharge notes in Canada revealed a consistent rise in caesarean section rates resulting in surge of complications like abnormal placentation, uterine rupture and also in the incidence of atonic postpartum haemorrhage necessitating hysterectomy [22]. In our study, 76.5% had ≥ 1 prior caesarean section history and 44.1% had placenta previa, with a strong overlap between the two. PAS was frequently associated with previous caesarean deliveries and placenta previa, two well-established risk factors. The increase in the number of caesareans sections has caused an increase in abnormal placentation, placenta previa, and uterine scarring [23, 24]. A simple prenatal ultrasound in high-risk cases of placenta previa and previous caesarean section has an excellent diagnostic accuracy in identifying PAS with sensitive ultrasound signs like disruption in bladder myometrial interface [32]. Therefore, all high-risk cases should undergo ante-natal ultrasound screening for PAS and suspected cases should timely be referred to tertiary care centres for evaluation and management.

Other indications included intractable PPH (20.6%) and uterine rupture (20.6%), the latter often following unmonitored labour or rupture of unusual sites ectopic pregnancies or injury during abortion procedures. In a study by Pawar *et al.* uterine rupture, primarily seen in multiparas and those with previous uterine surgery, accounted for 15-25% of OH cases [27]. Their incidence has decreased slightly due to better antenatal surveillance and emergency response system. Atonic PPH contributes to EOH but EOH incidence due to uterine atony is declining due to use of uterotonics and haemostatic agents and surgical techniques like brace sutures, internal artery ligation, selective arterial embolization [25, 26]. Two cases of PPH in our study were notable for delayed presentation (12 hours post-LSCS). Other cases involved elderly primigravida women with hypertensive disorders and twin pregnancies conceived through IVF. These findings highlight the complex interplay of age, ART, and comorbidities in modern obstetrics.

Maternal outcomes

Maternal outcomes after EOH are one of the indicators of maternal care. The maternal morbidity burden was significant in our study. 88.2% cases required ICU admission, primarily due to haemorrhagic shock and need for resuscitation. The most common post-operative complication was anaemia (70.6%), followed by haemorrhagic shock (29.4%) and Disseminated Intravascular Coagulation (DIC) (11.8%). Other postoperative complications included surgical site infection (14.7%), sepsis (5.8%), acute renal failure, hepatic encephalopathy, and postpartum psychosis. Our study is broadly in line with earlier observations that EOH is associated with high maternal morbidity [8, 28].

Two maternal deaths (5.8%) were recorded, one in home vaginal delivery with uterine inversion and PPH, and the other post-LSCS with unexplained PPH and rapid deterioration. Both succumbed to DIC and multi-organ dysfunction syndrome

(MODS). Chaudhary *et al*. (2021) reported maternal mortality rates of 4-6% which align with the 5.8% found in our study [17]. This mortality rate, while within the acceptable range reported globally (2-10%), reinforces the need for timely and appropriate management of high-risk pregnancies [29, 30]. Though not evident in our study, a cross-sectional trial conducted in UK revealed that life limiting foetal conditions like aneuploidy/genetic conditions may grossly increase the risk of preterm labour, post-partum haemorrhage and hypertensive disorders with subsequent rise in obstetric interventions like caesareans and hysterectomies. Such conditions in pregnancy increases maternal risk burden and highlights the importance of individualized counselling and preparedness with regards to complications, outcome and mode of delivery in continuing such pregnancy [33].

Foetal outcomes

Despite the critical nature of these obstetric emergencies, 67.6% of neonates were born alive, including three sets of twins. Foetal outcomes were influenced by gestational age and neonatal mortality (20.6%) was largely attributed to prematurity and its sequelae [10, 31].

This suggests that while maternal survival remains a priority in EOH cases, neonatal outcomes can also be improved with better antenatal planning and neonatal intensive care support (NICU).

Implications and recommendations

This study reaffirms the changing epidemiology of emergency obstetric hysterectomy, with placenta accreta spectrum emerging as the predominant indication, linked strongly to previous caesarean deliveries and placenta previa. There is an emerging trend of caesarean as mode of delivery due to patient preferences, monitoring concerns and medico-legal aspects. Additionally, anaesthesia advancements and blood bank facilities have made it a safer and painless alternative to labour. This has resulted in surge of complications like abnormal placentation, uterine rupture and atonic postpartum haemorrhage. This makes emergency obstetric hysterectomy immensely relevant in modern obstetric practice. Unregistered pregnancies, emergency referrals, and caesarean deliveries highlight systemic gaps in antenatal care, referral systems, and surgical decision-making. There are grey areas in some non-obstetrical medical conditions where there are no consensus or limited data available for the management of labour. Such conditions include controlled cardiac diseases, seizure disorders, hip and spine disorders [34], ophthalmic conditions like mild to moderate myopia, history of retinal detachment, controlled diabetic retinopathy, glaucoma, or keratoconus [35]. These conditions though not very common but add to the burden of caesarean sections. Instead promoting natural birth, painless deliveries with use of epidural anaesthesia and training budding doctors do to so should be our plan of action. Thus, refusing caesarean section for non-obstetrical conditions, not supported by scientific literature is the way forward to prevent the rise of unnecessary caesarean sections in the modern era.

Key recommendations

Reducing unnecessary primary caesarean sections, to limit cumulative scarring and future PAS. Will require implementation of protocols and labour management guidelines especially in low-risk pregnancies.

Improving antenatal registration and early risk detection, particularly for placenta previa and PAS using ultrasonography and MRI if need be.

Establishing referral protocols and preparedness plans for anticipated high risk obstetric cases between peripheral and tertiary centres.

Strengthening blood bank and ICU capabilities for managing obstetric haemorrhage, especially in high-volume obstetric centres.

Training obstetricians in conservative haemorrhage control techniques including haemostatic suturing techniques, embolization and internal artery ligation procedures to reduce unnecessary hysterectomies where possible. Also labour rooms and operation theatres should be adequately equipped with uterotonic drugs, surgical haemostatic devices and balloon tamponade kits for PPH control especially for many centres in the developing countries.

CONCLUSIONS

Emergency obstetric hysterectomy is a useful and necessary intervention in select obstetric emergencies. The shifting trend in primary indication from uterine rupture and atonic PPH to placenta accreta spectrum (PAS) accounting for nearly 59% of all cases. Association of PAS with prior caesarean section underlines the need for policy and practice changes targeting caesarean reduction. Maternal outcome

remains challenging with high rate of ICU admissions and postoperative complications and mortality rate of 5.8%. Foetal outcomes were favourable in most cases, but prematurity contributed to neonatal mortality. Incidence of EOH and associated complications can be reduced to a large extent through better antenatal surveillance, capacity building, obstetric planning and systemic improvement in maternal health services.

COMPLIANCE WITH ETHICAL STANDARDS

Authors' contributions
S.M.: Data curation, investigation, formal analysis, writing – original draft, writing – review & editing. D.A.R.: Conceptualization, methodology, supervision. BG: Writing – original draft, formal analysis. T.G.: Supervision, writing – review & editing. S.M.V.: Supervision.

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Study registration
N/A.

Disclosure of interests
The authors declare that they have no conflict of interests.

Ethical approval
Study was approved by Institutional Ethics Committee of ESI Hospital Basaidarapur, Delhi. (IEC No./SC-1/2023/1966). The information of all patients was coded to ensure confidentiality.

Informed consent
As it is a retrospective study from available hospital records, hence patient consent was not required, approval taken from institutional ethics committee.

Data sharing
Data are available under reasonable request to the corresponding author due to privacy/ethical restrictions.

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