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The prevalent adverse delivery complications during the Sudan armed conflict 2023-2025

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ABSTRACT

Background: The ongoing armed conflict in Sudan has severely compromised maternity outcomes, increasing maternal and neonatal morbidity and mortality. This study aimed to identify the common unfavourable delivery complications during the Sudan armed conflict of 2023-2025. **Methodology:** This study was a retrospective descriptive analysis conducted at El-Obeid Teaching Hospital for Women and Maternity in North Kordofan State, Sudan. Information regarding women who experienced birth-related complications from May 2023 to May 2025 was obtained from hospital records. **Results:** Among the 320 women, 169 (52.8%) underwent vaginal assisted delivery, while the rest, 151 (47.2%), had caesarean sections. Obstructed labor was encountered by 112 out of 320 (35%) women, of whom 62 out of 169 (36.8%) underwent vaginal delivery and 50 out of 151 (33%) underwent cesarean section. Identical values were documented for eclampsia. Retained placenta occurred in 103 out of 320 cases (32.2%), with 57 out of 169 (33.7%) being vaginal deliveries and 46 out of 151 (30.5%) being cesarean deliveries. Uterine rupture occurred similarly to retained placenta. Postpartum hemorrhage was observed in 105 out of 320 cases (32.8%), comprising 50 out of 169 vaginal deliveries (29.6%) and 55 out of 151 cesarean sections (36.4%). Conveyance Sepsis occurred similarly to postpartum hemorrhage. **Conclusion:** Complications including obstructed labor, eclampsia, retained placenta, uterine rupture, postpartum hemorrhage, and sepsis are particularly prevalent among Sudanese mothers within the context of wartime circumstances.

Keywords: Obstructed Labor, delivery, postpartum, hemorrhage, eclampsia, uterine rupture

INTRODUCTION

The World Health Organization (WHO) lists hemorrhage, infections, high blood pressure (pre-eclampsia/eclampsia), and delivery difficulties as the primary causes of maternal mortality, accounting for 75% of cases. Obstructed labor, aberrant fetal positions (including breech), umbilical cord prolapse, uterine rupture, shoulder dystocia, and newborn hypoxia are some serious labor

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issues [1]. Despite reductions, Africa accounts for 70% of the maternal deaths worldwide. Severe hemorrhage, infection, high blood pressure, and unsafe abortions, compounded by poor healthcare infrastructure, conflict, and gender inequality, increase lifetime risks, especially in Sub-Saharan Africa, where Nigeria, Chad, and South Sudan have the highest rates [2].

Preventable maternal deaths remain alarmingly high throughout the states of Sudan. The limited data on maternal mortality in Sudan makes the exact burden unclear, a situation that is greatly exacerbated by the ongoing war [3]. The ongoing conflict in Sudan since 2023 has significantly affected the accessibility, quality, and availability of maternal health services. Estimates indicate that more than 1 million pregnant women in Sudan are in need of health care [4, 5]. Antenatal care, safe deliveries, and postnatal care have been hampered by hospital building and health center destruction, a shortage of medication and medical supplies, and conflict-related attacks on medical staff and hospitals. Many pregnant women travel far to get care, which can be exhausting and hazardous to them and their babies [6]. A delay in emergency obstetric care and childbirth in areas with inadequate sanitation can exacerbate Sudan's newborn and mother death rates. The UN indicates 295 maternal deaths per 100,000 live births and 54.9 baby deaths per 1,000 live births [7]. However, the current study was designed to explore the common unfavourable delivery complications during the Sudan armed conflict of 2023-2025.

MATERIALS AND METHODS

This study was a retrospective descriptive analysis carried out at El-Obeid Teaching Hospital for Women and Maternity in North Kordofan State, Sudan, spanning from January 2025 to November 2025. Data concerning women who presented with delivery complications from May 2023 to May 2025 were extracted from hospital records. The sample size comprised all patients admitted to the hospital due to delivery complications from January 2025 to November 2025.

Data Analysis

Data related to this study was initially prepared in a data sheet, then entered a computer software statistical package for Social Sciences (SPSS). Frequencies, percentages, means, and cross-tabulations were obtained.

RESULTS

This study investigated 320 women aged 18 to 39 years with a mean age of 29 years. Most women were aged 31-35 years, followed by 20-25 and > 35, representing 79/320 (24.7%), 71 (22.2%), and 65 (20.3%), respectively, as shown in Fig. 1.

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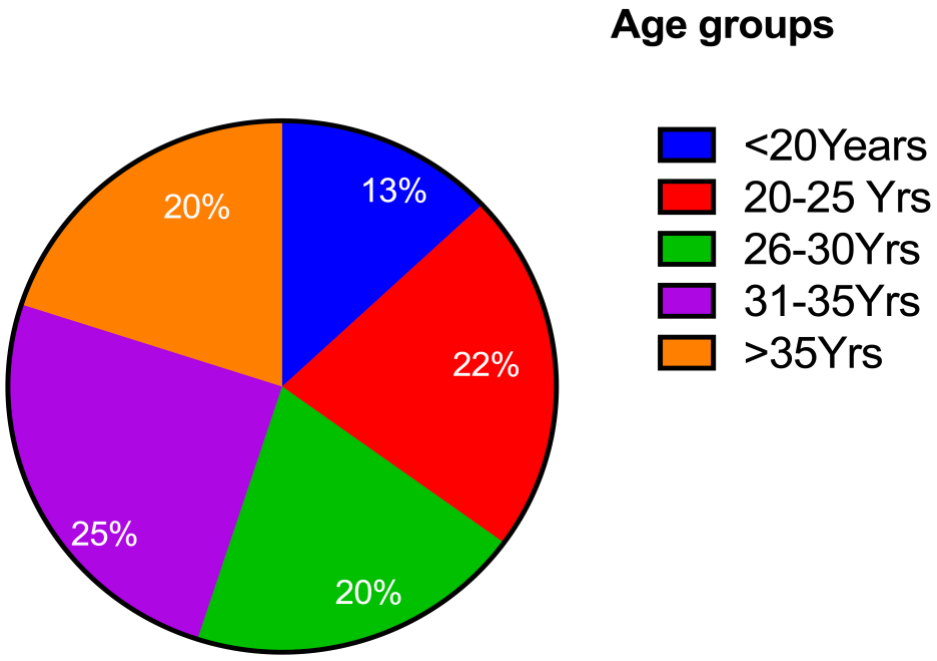

Figure 1. Proportions of study subjects' age ranges

Of the 320 women, 169/320 (52.8%) had delivered by vaginal assisted delivery, and the remaining 151/320 (47.2%) were with caesarean sectioning. Obstructed labor was experienced by 112/320 (35%) women, of whom 62/169 (36.8%) were vaginal deliveries and 50/151 (33%) were cesarean. The same values were reported for eclampsia. Retained placenta had occurred in 103/320 (32.2%), of whom 57/169 (33.7%) were vaginal and 46/151 (30.5%) were cesarean. Uterine rupture had happened the same as in retained placenta. Postpartum hemorrhage occurred in 105/320 (32.8%), including 50/169 (29.6%) vaginal and 55/151 (36.4%) cesarean. Delivery sepsis had happened the same as in postpartum hemorrhage, as indicated in Table 1, Fig. 2.

Table 1. Distribution of the study subjects by mode of delivery and delivery-related complications

Variable	Vaginal n=169	Caesarean n=151	Total n=320
Obstructed Labour			
No	107	101	208
Yes	62	50	112
Eclampsia			
No	107	101	208
Yes	62	50	112
Retained placenta			
No	112	105	217

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Yes	57	46	103
Uterine rupture			
No	112	105	217
Yes	57	46	103
Postpartum hemorrhage			
No	119	96	215
Yes	50	55	105
Delivery Sepsis			
No	119	96	215
Yes	50	55	105

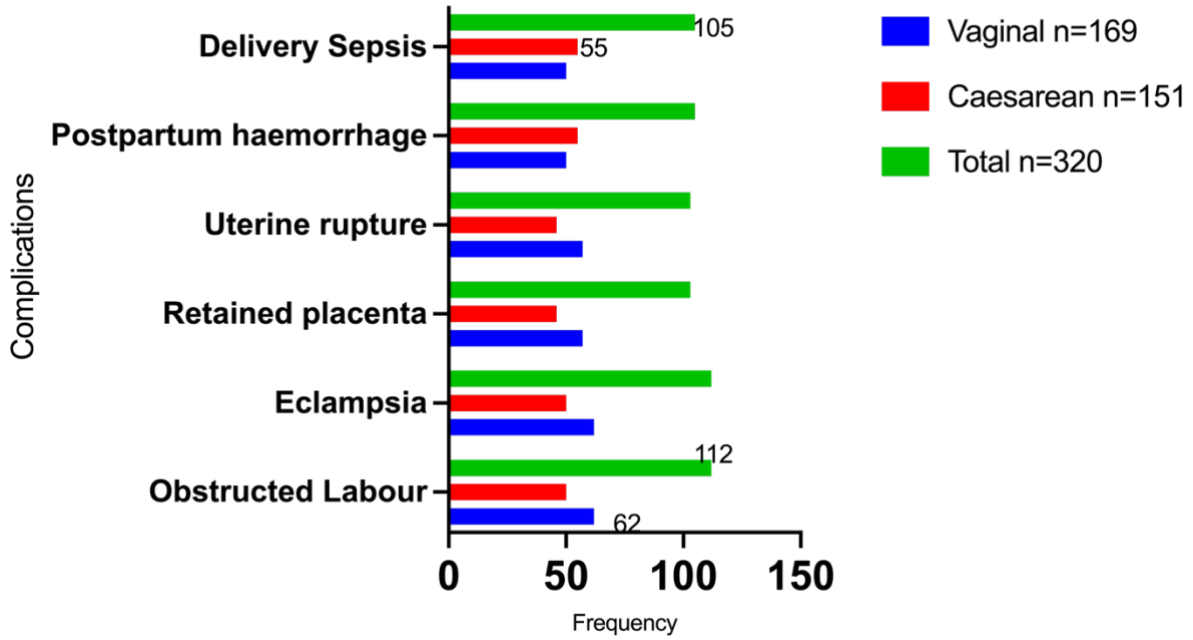

Figure 2. Description of the study subjects by mode of delivery and delivery-related complications

Table 2 and Fig. 3 summarized the distribution of the study subjects by mode of delivery and post-delivery complications. About 166/320 (52%) had post-delivery hospital stays (PDHS) for more than 72 hours, of whom 87/169 (51.5%) were vaginal and 79/151 (52.3%) were cesarean. About 154/320 (48%) had PDHS for less than 72 hours, of whom 82/169 (48.5%) were vaginal and 72/151 (47.7%) were cesarean.

Postpartum complications of thromboembolic events (PCTE) had

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occurred in 145/320 (45.3%) women, including 66/169 (39%) vaginal and 79/151 (52.3%) cesarean. Postpartum complications, secondary hemorrhage (PCSH), had occurred in 175/320 (54.7%), including 103/169 (61%) vaginal and 72/151 (47.7%) cesarean. Postpartum complications of wound infection (PCWI) had occurred the same as in PCSH.

Table 2. Distribution of the study subjects by mode of delivery and post-delivery complications

Variable	Vaginal n=169	Caesarean n=151	Total n=320
PDHS			
>72 hours	87	79	166
24–72 hours	82	72	154
PCTE			
No	103	72	175
Yes	66	79	145
PCSH			
No	66	79	145
Yes	103	72	175
PCWI			
No	66	79	145
Yes	103	72	175

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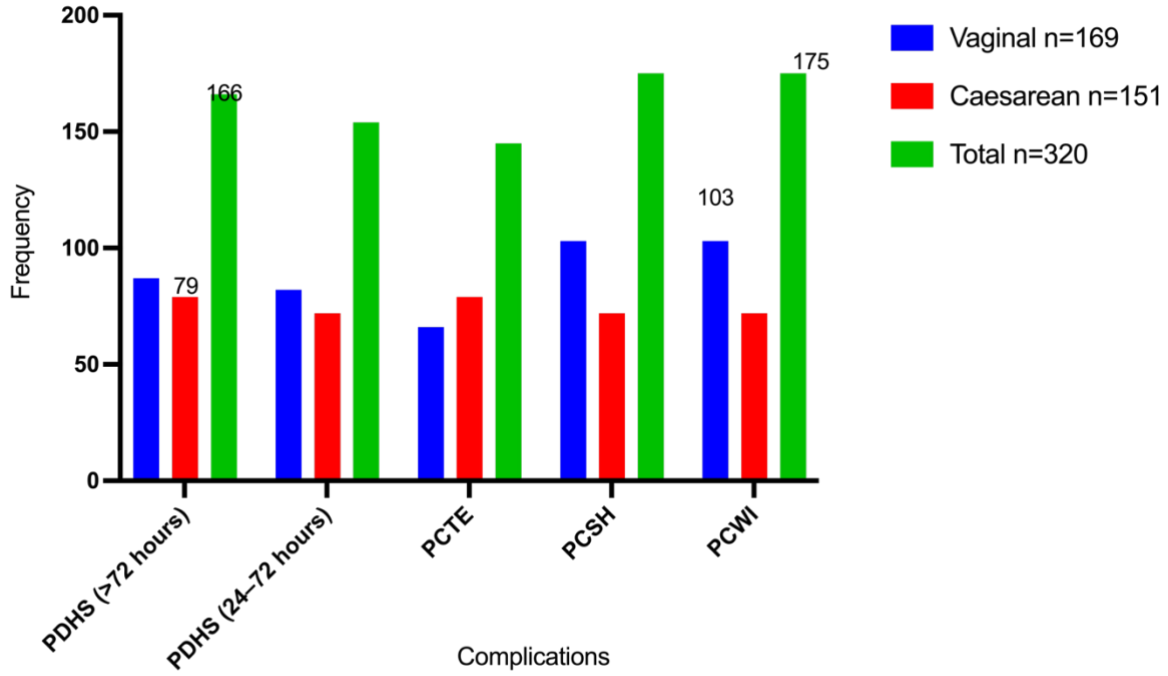

Figure 3. Description of the study subjects by mode of delivery and post-delivery complications

Distribution of the study subjects by age and delivery-related complications was summarized in Table 3, Fig. 4. Obstructed labor was most frequently seen among the age group 26-30 years, followed by 20-25, 31-35, and >35 years, representing 27/64 (42.2%), 26/71 (36.6%), 25/79 (31.6%), and 18/65 (27.7%), respectively. Retained placenta was most frequently seen among the age group 31-35 years, followed by 20-25 and >35, constituting 27/79 (32.2%), 26/71 (36.6%), and 22/65 (33.8%), in this order. Postpartum hemorrhage was most frequently seen among the age group 31-35 years, followed by > 35 and 26-30, representing 27/79 (34.2%), 25/65 (38.5%), and 20/64 (31.3%), in this order.

Most of those hospitalized for more than 72 hours were in the age range 26-35, followed by > 35 years, representing 80/143 (60%) and 36/65 (55.3%) in that order.

Table 3. Distribution of the study subjects by age and delivery-related complications

Variable	**<20 years**	**20-25**	**26-30**	**31-35**	**>35**	**Total**
	n=41	n=71	n=64	n=79	n=65	n=320
Obstructed labour						
No	25	45	37	54	47	208
Yes	16	26	27	25	18	112
Eclampsia						
No	25	45	37	54	47	208
Yes	16	26	27	25	18	112
Retained placenta						
No	30	45	47	52	43	217

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Yes	11	26	17	27	22	103
Uterine rupture						
No	30	45	47	52	43	217
Yes	11	26	17	27	22	103
Postpartum hemorrhage						
No	27	52	44	52	40	215
Yes	14	19	20	27	25	105
Sepsis						
No	27	52	44	52	40	215
Yes	14	19	20	27	25	105
PDHS						
>72 hours	20	30	40	40	36	166
24–72 hours	21	41	24	39	29	154

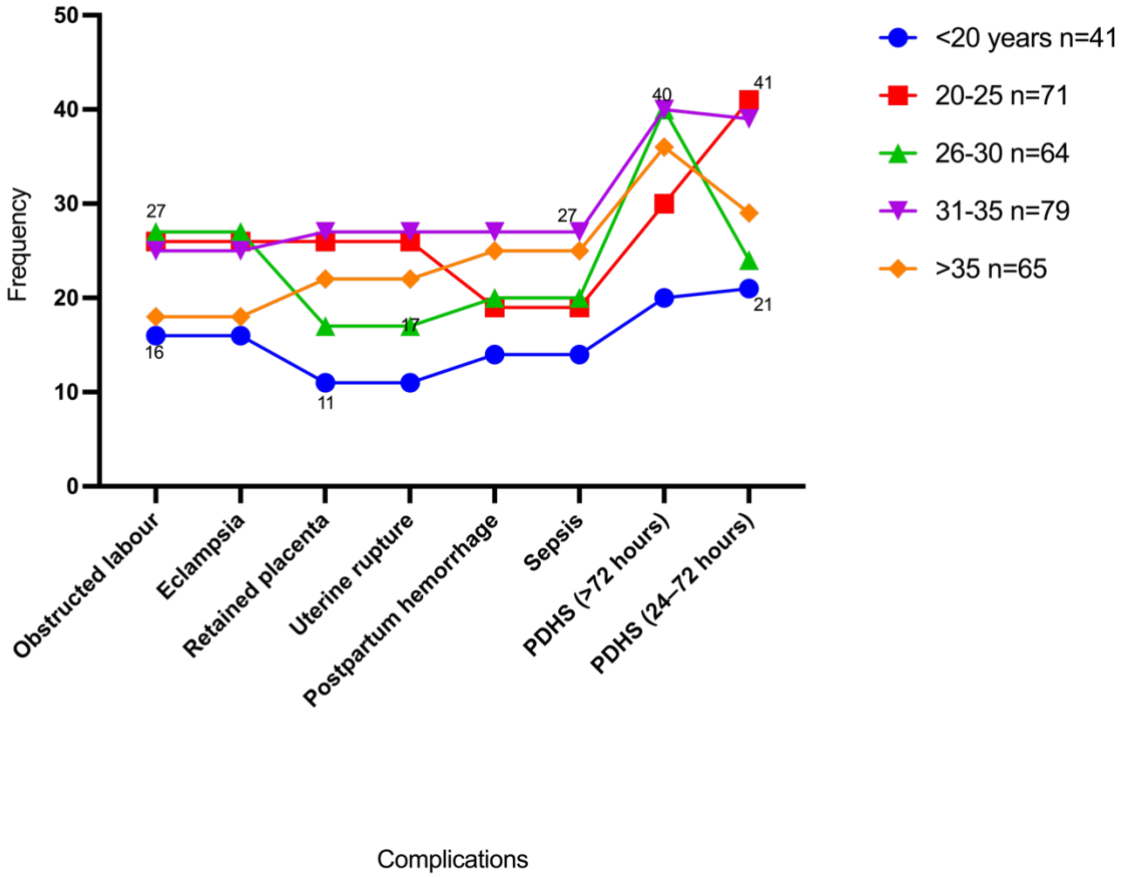

Figure 4. Distribution of the study subjects by age and delivery-related complications

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DISCUSSION

Maternal mortality is a significant public health concern that indicates the efficacy of healthcare systems and the general health of populations. Maternal mortality in Sudan continues to be a critical issue, influenced by multiple variables. Nevertheless, this study was originally intended to investigate the prevalent adverse delivery complications arising amidst the armed conflict in Sudan from 2023 to 2025.

Obstructed labor and eclampsia were the most prevalent complications observed during labor in this study. Obstructed labor, resulting from prolonged labor, continues to be a major factor in maternal and perinatal mortality in settings with limited resources [8]. Obstructed labor causes uterine rupture, postpartum hemorrhage, life-threatening infections (sepsis), organ damage (bladder/rectum), obstetric fistula, and possibly hysterectomy for the mother; asphyxia, brain damage, stillbirth, or neonatal death for the baby; and long-term mental health issues and social stigma [9].

Eclampsia is a serious complication of pregnancy marked by the occurrence of seizures in individuals with hypertensive disorders. Eclampsia is characterized by the onset of seizures, which may be tonic-clonic, focal, or multifocal, occurring in the absence of other underlying conditions like epilepsy or cerebrovascular incidents. Eclampsia typically manifests within the first 48 hours postpartum; nonetheless, it may occur prior to, during, or following labor. The greatest likelihood of occurrence is during the first week following childbirth. Eclampsia may develop in certain instances [10].

Preeclampsia remains a significant health challenge in sub-Saharan Africa, contributing substantially to maternal and neonatal mortality rates. Preeclampsia and eclampsia (PE/E) are major contributors to maternal and neonatal deaths in developing countries, associated with 10-15% of direct maternal deaths and nearly a quarter of stillbirths and newborn deaths, many of which are preventable with improved care [11,12].

In this study, approximately 32% of patients presented with either uterine rupture or retained placenta. Uterine rupture is a rare but potentially lethal complication that can occur during a subsequent vaginal delivery after prior uterine surgery [13]. A serious obstetric emergency that poses serious hazards to both the mother and the fetus is uterine rupture [14].

Normal labor is defined by the occurrence of regular and painful uterine contractions that lead to progressive labor. Abnormal labor patterns are classified into categories: abnormalities of the first stage, which encompasses cervical dilation to complete cervical dilation, and abnormalities of the second stage, which involves the descent of the presenting part leading to the delivery of the baby. Abnormal third-stage labor requiring intervention is defined as placenta retention exceeding 30 minutes, given that the majority of third stages conclude within the initial 10 to 20 minutes post-delivery [15]. Complications may encompass significant hemorrhage, endometritis, or retained placental tissue, the latter potentially resulting in delayed hemorrhage or infection [16].

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Postpartum hemorrhage (PPH), as well as sepsis, occurred in around 33% of the patients. Postpartum hemorrhage causes the death of one woman every four minutes, making it the greatest cause of maternal death in childbirth. About 25% of maternal deaths globally are caused by PPH, making it a major public health issue. Despite medical breakthroughs, hemorrhage remains the leading cause of pregnancy-related deaths in most nations, with a growing discrepancy between developed and developing healthcare systems. Most PPH deaths are avoidable. All those who care for pregnant women must understand the severity of this issue, how to identify women at risk for severe bleeding at childbirth, how to prevent and treat blood loss after delivery, and how to handle obstetric hemorrhage [17]. PPH is linked to a substantially increased long-term risk of cardiovascular disease and thromboembolism. The findings underscore the significance of postpartum cardiovascular risk assessment and preventive measures for women with a history of severe postpartum hemorrhage [18]. Understanding the causes of postpartum hemorrhage is essential for delivering appropriate treatment and services. Understanding the risk factors associated with postpartum hemorrhage can facilitate the management of modifiable risks. The identification of uterine atony as the predominant cause of postpartum hemorrhage reinforces the WHO's recommendation for the administration of prophylactic uterotonics to all women during childbirth. Understanding the risk factors significantly associated with postpartum hemorrhage is essential for identifying women at high risk who may benefit from improved prophylactic measures and treatment options. The significance of various simultaneous factors contributing to postpartum hemorrhage underscores the necessity for treatment bundles [19].

The majority of patients in the present study had stayed in the hospital after delivery for more than 72 hours. The length of hospital stays following a challenging delivery depends on the type and severity of complications. Comprehensive monitoring, individual recovery needs, and discharge planning are all important factors in determining the length of the hospital stay. Providing sufficient care during this time is critical for both maternal and newborn health. According to reports, the average length of hospital stay after cesarean delivery was 2.8 days. Women with hypertension, gestational age at birth less than 38 weeks, and postoperative problems have a longer hospital stay [20].

While the current study offers valuable insights into maternal complications during the armed conflict in Sudan, it is not without its limitations, particularly regarding its retrospective design.

Conclusion: Complications such as obstructed labor, eclampsia, retained placenta, uterine rupture, postpartum hemorrhage, and sepsis are notably prevalent among Sudanese mothers in the context of wartime conditions.

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CONFLICT OF INTEREST

The author declares that they have no conflict of interest to disclose.

ETHICAL CONSIDERATIONS

Ethical approval was obtained from the Ministry of Health, and the hospital administration received administrative authorization before data collection. The study adhered to the principles of confidentiality and responsible use of routinely collected health information.

ETHICAL APPROVAL

The protocol of this study had been approved by the Human Ethics Committee at Prof MRCC. Approval number: HREC 0022/MRCC.5/25).

DISCLOSURE

This research was conducted without the use of artificial intelligence or assisted technologies, including the generation of figures.

DATA AVAILABILITY

The data supporting the conclusions of this article are included within the article, and further inquiries can be sent to the corresponding author.

AUTHOR'S CONTRIBUTION

Ahmed SM: Conceptual, study design, data collection, and approval.

Saad NAA: Conceptual, data analysis, and approval.

Ahmed HG: Conceptual, manuscript drafting, and approval.

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