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Abstract

Purpose: Uterine rupture during pregnancy is rare, often fatal, and can cause serious complications for both mother and fetus. Therefore, this study evaluated the outcomes of a group of Sudanese patients who experienced uterine rupture.

Materials and Methods: This study comprised a group of 26 female individuals who had a uterine rupture and received medical care at the maternity department of El-Obeid Teaching Hospital in Sudan's North Kordofan state. The patients were admitted over the course of one year. We obtained the requisite identifying data and demographic characteristics from every subject.

Findings: The majority of cases have normal hospital stays (65%). About 35% of patients have prolonged hospital stays. The most common postoperative complication experienced was venous thromboembolism (VTE) (31%). Most patients presented with labor pain followed by vaginal bleeding and abdominal pain, constituting (57.7%), (27%), and (11.5%), in that order.

Implications to Theory, Practice and Policy: Sudan experiences a high prevalence of uterine rupture, which leads to quite high rates of adverse outcomes during childbirth, despite having relatively low rates of premature death. The most unfavorable outcomes are extended hospitalization, venous thromboembolism (VTE), and the need for blood transfusion. Careful follow-up during pregnancy and choosing the appropriate delivery mode is important.

Keywords: *Uterine rupture, pregnancy, maternal outcomes, Sudan, H51*

1.0 INTRODUCTION

Although uncommon, uterine rupture during pregnancy can have severe consequences. A comparatively higher prevalence is observed in uteri, with scarring resulting from labor stimulation subsequent to a cesarean section [1]. A uterine rupture can occur at any site within the uterus, typically in its most vulnerable region. Currently, there is no reliable method for identifying or forecasting the most vulnerable area of the uterus. Swift identification is crucial for the management of uterine rupture [2].

Uterine rupture is a serious threat to the health and safety of both mothers and babies. Silent uterine rupture in pregnant women without uterine contractions is difficult to diagnose due to the presence of nonspecific symptoms, indicators, and test markers [3]. The absolute risk of uterine rupture is modest, but clinical, historical, obstetrical, and intrapartum variables can raise it. Healthcare providers managing labor trials after cesarean birth must understand these risk variables in order to determine acceptable candidates, maximize safety and benefits, and avoid risks. Cesarean section patients should be cautious about labor augmentation and induction. Patients with one low transverse, low vertical, or unknown uterine incision should be given the option of a natural or medically induced vaginal delivery after a previous cesarean section after thorough assessment, guidance, strategizing, and collaborative decision-making. To guarantee hospital safety, monitor the mother and fetus, avoid prostaglandins, and carefully control oxytocin dosage when induction medicines are needed. Further study is needed to uncover risk factors, appropriate labor and induction treatment, pregnancy prediction tools, and techniques to prevent uterine rupture after vaginal birth after surgery. Improved information will aid patient counseling, increase the trial of labor rates after cesarean and vaginal birth, and reduce uterine rupture morbidity and death [4].

A ruptured uterus increases the likelihood of a variety of adverse maternal outcomes. In these individuals, the risk factors for composite maternal morbidity following rupture should be thoroughly evaluated [5]. Nevertheless, there is a lack of sufficient evidence from low-income countries when it comes to identifying the factors that contribute to uterine rupture following trial labor. A Sudanese study, examining cases of uterine rupture, found that several factors, including the availability of facilities and demographic factors, can influence the outcomes of neonates. Most newborns delivered exhibited unfavorable conditions [6]. Thus, the objective of this study was to evaluate the results of a group of Sudanese patients who experienced uterine rupture.

2.0 MATERIALS AND METHODS

In this study, the maternity department at El-Obeid Teaching Hospital in Sudan's North Kordofan state treated a group of 26 women who had suffered uterine rupture. The patients arrived within a one-year period. We collected the necessary identification data and demographic characteristics from each patient. Every patient willingly agreed to participate in the study. We analyzed the data using the SPSS program to obtain cross-tabulations, frequencies, and percentages. The Human Research Ethics Committee at MRCC has approved the study's proposal (Approval Number: HREC 0004/MRCC.03/24).

3.0 FINDINGS

We investigated 26 women with uterine rupture, ages 20 to 42, with a mean age of 30. Most patients were multipara, followed by grand multipara and primigravid, representing 18/26 (69%),

6/26 (23%), and 2/26 (8%), respectively. About 19 (73%) of the patients were from urban areas, and the remaining 7 (27%) were from rural areas. Most patients had a primary level of education, followed by secondary and illiterate, constituting 13 (50%), 7 (27%), and 5 (19%), respectively. About 16 (61.5%) of the patients were farmers, and 9 (34.6%) were farmers, as indicated in Table 1, Figure 1.

Table 1: Distribution of the Study Subjects According to Demographic Characteristics

Variable	Primigravida	Multipara	Grand-multipara	Total
Age				
<25 years	1	6	0	**7**
26-30	0	6	3	**9**
31-35	1	4	1	**6**
36+	0	2	2	**4**
Total	2	18	6	**26**
Residence				
Rural	0	7	0	**7**
Urban	2	11	6	**19**
Total	2	18	6	**26**
Education				
Illiterate	0	4	1	**5**
Primary	1	9	3	**13**
Secondary	1	4	2	**7**
Graduate	0	1	0	**1**
Total	2	18	6	**26**
Occupation				
Housewife	1	11	4	**16**
Farmer	1	6	2	**9**
Teacher	0	1	0	**1**
Total	**2**	**18**	**6**	**26**

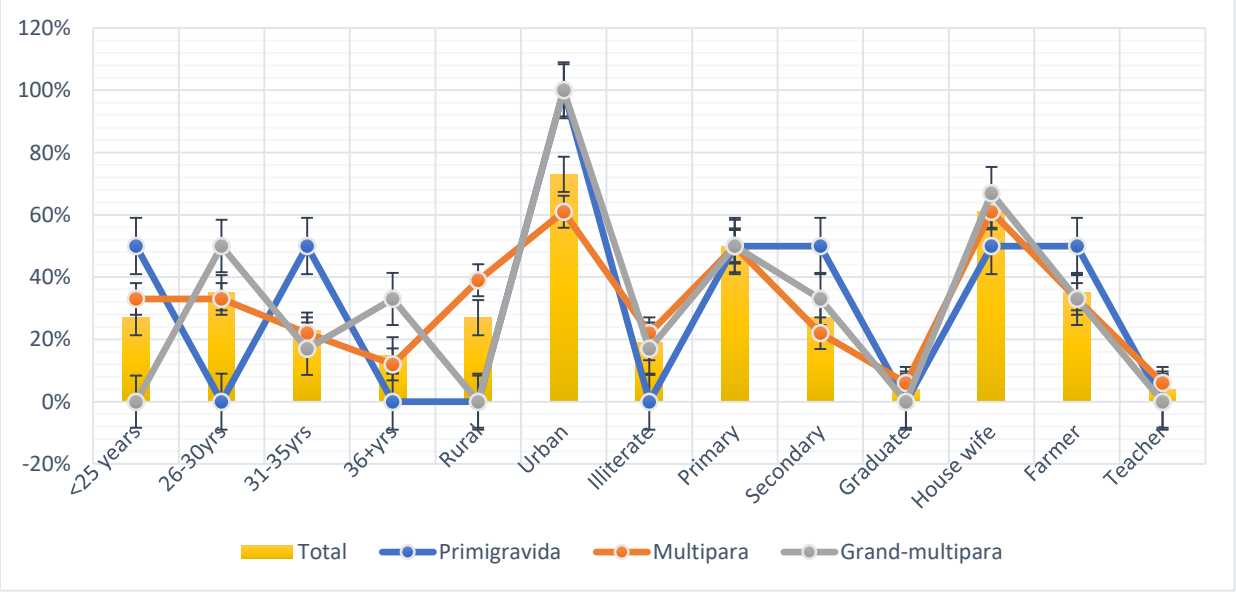

Figure 1: Lists the Study Subjects According to Their Demographic Characteristics

As shown in Table 2 and Figure 2, the hospital was the place of delivery for most patients (15,58%), and the remaining 11 (42%) were delivered at home. Out of 15 patients delivered at home, 12 (80%) were multipara, and 3 (20%) were grand-multipara. Of the 11 delivered at home, 2 (18%) were primigravida, 6 (55%) were multigravida, and 3 (27%) were grandmultipara. Three (12%) patients (one multipara and two grandpara) experienced induced labor, while the remaining 23 (88%) experienced spontaneous labor. The majority of patients (18,69%) received referrals from their homes, with rural hospitals (5,19%) and inpatients (3,12%) following closely behind. Before 4 hours of the onset of labor, about 20 patients (77%) received referrals.

Table 2: Distribution of the Study Subjects by Initial Circumstances

Variable	Primigravida	Multipara	Grand-multipara	Total
Place of delivery				
Home	2	6	3	**11**
Hospital	0	12	3	**15**
Total	**2**	**18**	**6**	**26**
Onset of labor				
Spontaneous	2	17	4	**23**
Induced	0	1	2	**3**
Total	**2**	**18**	**6**	**26**
Referral site				
Home	1	14	3	**18**
Rural hospital	1	3	1	**5**
Inpatient	0	1	2	**3**
Total	**2**	**18**	**6**	**26**
Time of referral to operation				
1.00	0	1	1	**2**
2.00	0	5	1	**6**
3.00	1	2	1	**4**
4.00	1	7	0	**8**
5.00	0	1	0	**1**
6.00	0	0	1	**1**
7.00	0	1	0	**1**
10.00	0	1	0	**1**
12.00	0	0	1	**1**
18.00	0	0	1	**1**
Total	**2**	**18**	**6**	**26**

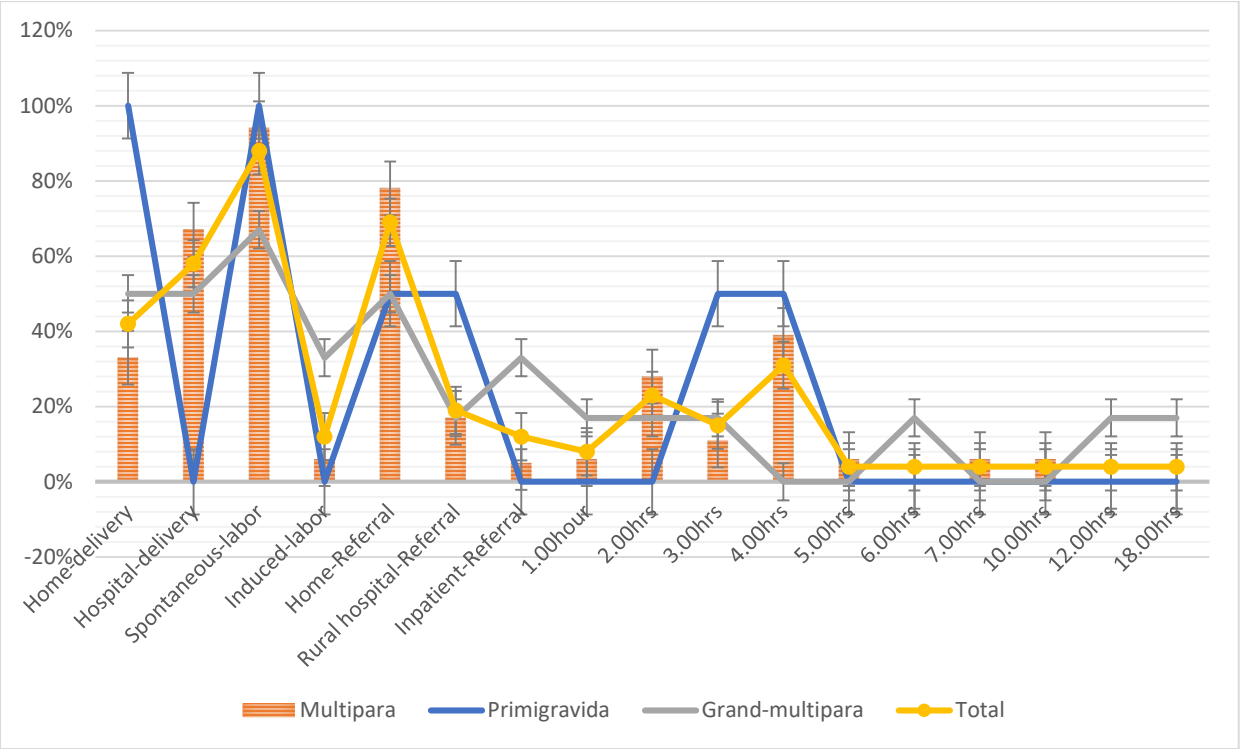

Figure 2: Study Subjects Categorized by Initial Circumstances

Most patients presented with labor pain followed by vaginal bleeding and abdominal pain, constituting 15 (57.7%), 7 (27%), and 3 (11.5%), in that order. At initial presentation, the majority of patients (20,77%) were in a state of illness; however, 5 (19%) were in a state of well-being, and only one patient (4%) was in a comatose state. Regarding intraoperative intervention, most patients underwent repair (17%), followed by hysterectomy and repair with tubal ligation, representing 6 (23%), and 3 (12%), respectively. 16 (61.5%) patients received a blood transfusion. Most patients received 6/16 (37.5%) blood units, followed by both (one and two) units (3/16) (18.8%) for both, as indicated in Table 3 and Figure 3.

Table 3: Distribution of the Study Subjects by Clinical Conditions

Variable	Primigravida	Multipara	Grand-multipara	Total
Clinical presentations				
Abdominal pain	0	3	0	**3**
Labor pain	2	9	4	**15**
vaginal bleeding	0	6	1	**7**
Other	0	0	1	**1**
Total	**2**	**18**	**6**	**26**
Patient condition				
Well	0	4	1	**5**
Ill	2	14	4	**20**
Comatose	0	0	1	**1**
Total	**2**	**18**	**6**	**26**
Intra operative intervention				
Repair	2	14	1	**17**
Repair and tubal ligation	0	1	2	**3**
Hysterectomy	0	3	3	**6**
Total	**2**	**18**	**6**	**26**
Blood transfusion				
Yes	1	9	6	**16**
No	1	8	0	**9**
Total	**2**	**17**	**6**	**25**
Number of transfused blood units				
1.00	1	2	0	**3**
2.00	0	2	1	**3**
3.00	0	3	3	**6**
4.00	0	1	0	**1**
5.00	0	1	0	**1**
6.00	0	0	1	**1**
8.00	0	0	1	**1**
Total	**1**	**9**	**6**	**16**

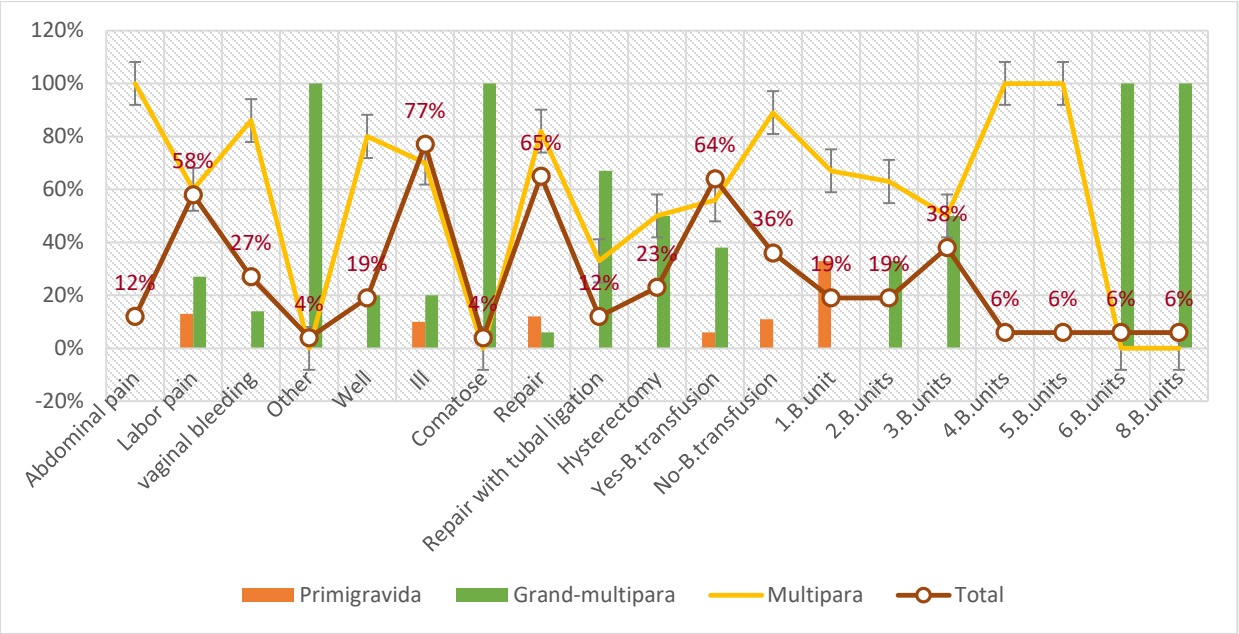

Figure 3: Shows the Study Subjects Categorized by Clinical Conditions

Table 4 and Figure 4 describe the patients' outcomes and complications. The majority of cases have normal hospital stays (17%). However, about 9 (35% of patients) have prolonged hospital stays. The most common postoperative complication experienced was venous thromboembolism (VTE) (31%). Figures 5 and 6 show the description of the patients by time of referral, postoperative complications, and duration of labor.

Table 4: Distribution of the Study Subjects by Outcomes and Complications

Variable	Primigravida	Multipara	Grand-multipara	Total
Maternal outcomes				
Normal hospital stays	1	14	2	17
Prolonged hospital stays	1	4	4	9
Total	**2**	**18**	**6**	**26**
Postoperative complication				
VTE	1	4	3	8
Shock	0	1	0	1
Others	0	1	1	2
No	1	12	2	15
Total	**2**	**18**	**6**	**26**

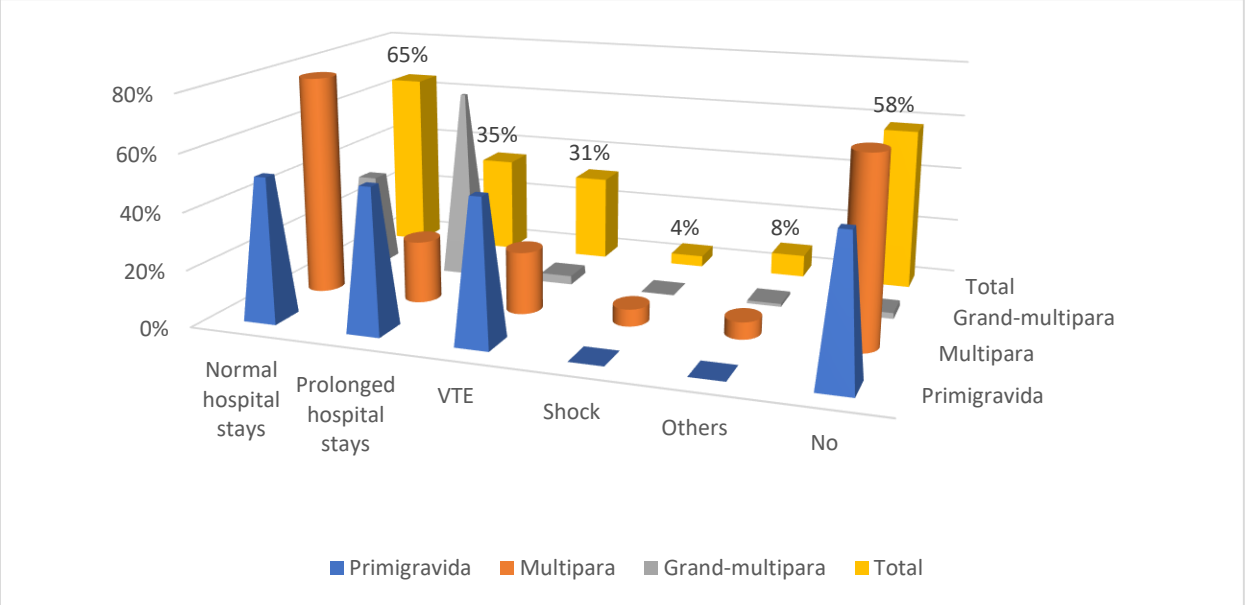

Figure 4: Patients by Outcomes and Complications

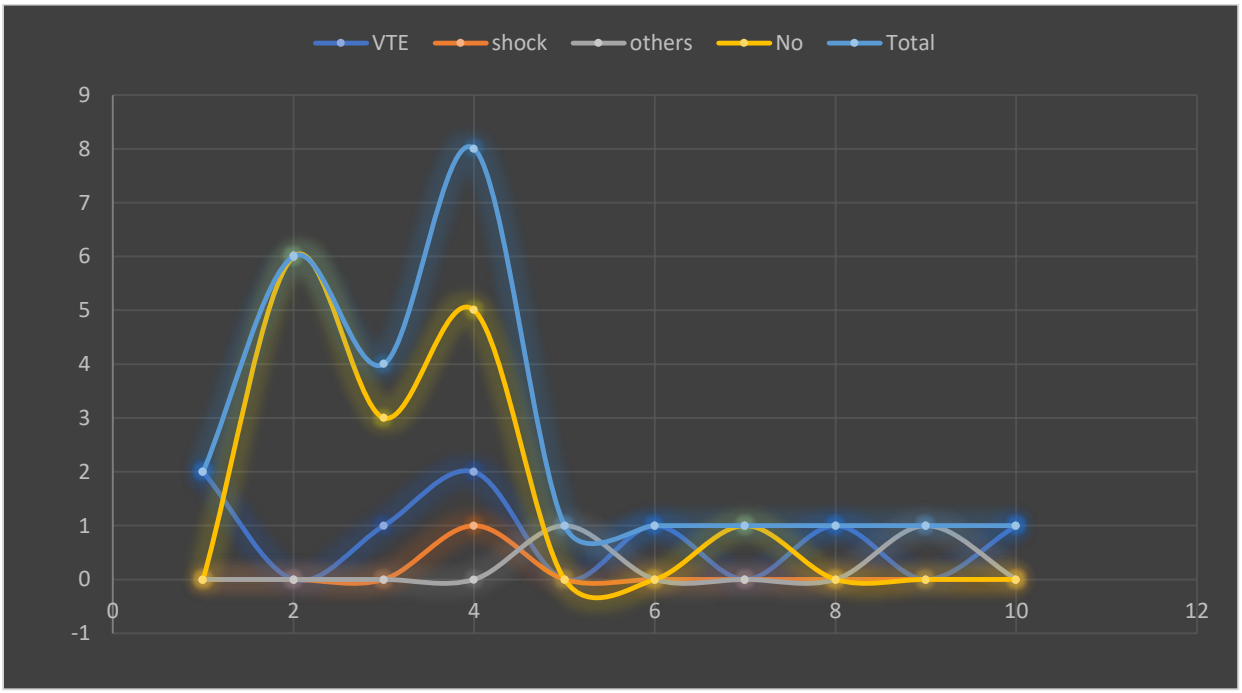

Figure 5: Description of the Patients by Time of Referral and Postoperative Complications

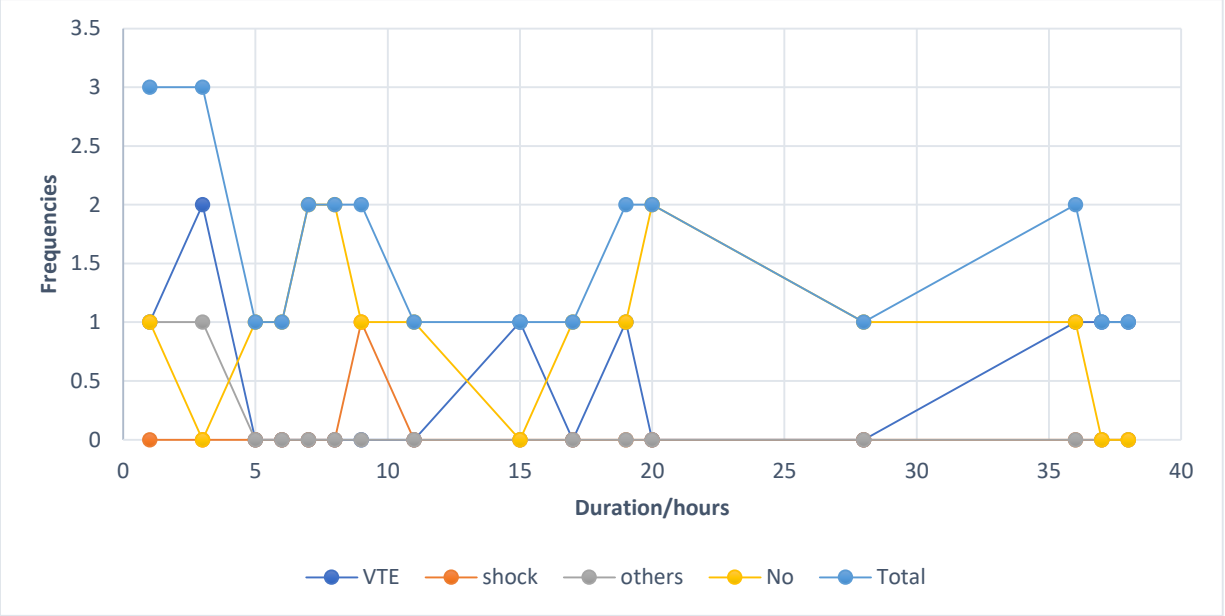

Figure 6: Provides a Description of the Patients Based on the Duration of Labor and Postoperative Complications

Discussion

A ruptured uterus can have a variety of negative consequences for the mother. For these individuals, a comprehensive assessment of the risk factors associated with composite maternal morbidity following rupture is critical. In Sudan and other low-income countries, there is a significant dearth of data on the outcomes of cases involving ruptured uteri. Thus, this study investigated the maternal outcomes of a group of patients who experienced a ruptured uterus in Sudan.

Acquired weakness from prolonged oxytocin use or connective tissue disabilities can lead to uterine rupture [7]. In the current study, approximately 42.3% of participants experienced complications, such as VTE and shock. In addition, a significant proportion of patients, approximately 34.6%, had a longer than expected duration of hospitalization. VTE is a significant contributor to maternal mortality. The incidence of VTE during pregnancy and the postpartum period has remained unchanged over the past twenty years, presenting an ongoing health concern. Pregnant and postpartum women have a higher risk of VTE due to a variety of factors. There are hormonally mediated and pregnancy-specific changes in coagulation that promote thrombosis, such as an increase in clotting factor production. Various physiological and anatomical mechanisms also play a role, such as a reduction in the rate of venous blood flow from the lower extremities as pregnancy advances. Cesarean delivery also carries a risk of VTE [8]. Patients with uterine rupture frequently experience bleeding and require large blood transfusions. Studies have indicated a connection between transfusions and an increased risk of thromboembolism [9].

The study found that the majority of complications occurred in women who had given birth multiple times (multipara) and those who had given birth to five or more children (grandmultipara). When providing instructions to pregnant women with a history of cesarean sections on the risks of attempting a vaginal delivery, it is critical to address the possibility of uterine rupture. Common

symptoms of this ailment, usually caused by a uterine malfunction following a cesarean delivery, include abdominal pain, non-reassuring fetal status, and loss of fetal station. Uterine surgical operations, such as myomectomy, are the leading causes of uterine rupture [10]. Managing a vaginal birth after a previous cesarean section in a facility with the personnel and resources to provide prompt cesarean delivery and advanced neonatal support is crucial for achieving the most favorable outcome [11].

VTE is a life-threatening medical disorder that can result in severe illness and death, making it an important public health issue. VTE is a complex disorder that arises from the interplay of hereditary, acquired, and environmental triggers. Physiological changes that happen during pregnancy make VTE more likely by causing Virchow's triad, which includes increased coagulation factors, decreased fibrinolysis, trauma, and venous stasis. Furthermore, pregnancy-related parameters such as being an older mother, being obese, having many pregnancies, and undergoing a cesarean delivery increase the risk of VTE. During pregnancy, VTE is a difficult task because it involves carefully weighing the advantages and disadvantages of anticoagulant treatment for both the mother and the fetus. An interdisciplinary strategy that includes obstetricians, hematologists, and neonatologists is essential to providing the best possible results for both the mother and infant [12].

The majority of patients in this study experienced labor pain (57.7%), with vaginal bleeding being the second most common symptom (27%). A uterine rupture may result in symptoms such as abdominal pain, vaginal bleeding, and alterations in the contraction pattern [13]. Approximately 61.5% of patients in the current series had blood transfusions. The need for blood transfusions may be indicative of severe cases and substantial blood loss. Managing anemia well, undergoing surgery at the right time, carefully watching how labor is going, having skilled surgeons, taking more steps to prevent infections, making it easier for people to get blood transfusions, and improving the quality of care for mothers are all important for preventing uterine rupture and improving the chances of a good outcome [14].

4.0 CONCLUSION AND RECOMMENDATIONS

In conclusion, uterine rupture is prevalent in Sudan, resulting in comparatively high rates of adverse obstetric outcomes despite relatively low premature death rates. Prolonged hospitilization, VTE, and blood transfusion are the most undesirable outcomes.

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