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Original Article

Presentation and perinatal outcome following umbilical cord prolapse in Ilorin

ABSTRACT

Background: Umbilical cord prolapse remains one of the most common obstetric emergencies associated with high foetal and neonatal morbidity and mortality.

Materials and Methods: A descriptive (retrospective) study was conducted on all women who were managed for umbilical cord prolapse over a 4-year period. The medical records of all eligible women were retrieved, and relevant information was extracted. The main outcome measures were perinatal outcome and the need for neonatal intensive care. The results were represented using simple descriptive methods.

Results: There were 56 women with umbilical cord prolapse out of the 14,892 deliveries with a prevalence of 0.38%. A single risk factor was present in 39 (72.2%) women, and breech presentation [12 (22.2%)] was the most common risk factor. In addition, 42 (77.8%) women presented with live foetuses with palpable umbilical cord pulsation in the first stage of labour and subsequently had emergency caesarean deliveries. The diagnosis-to-delivery interval for live foetuses was less than 30 min in seven women (16.7%) and between 30 and 60 min in 34 women (80.9%). All women who had foetal death at presentation subsequently had vaginal delivery. A total of 23 (54.8%) neonates were admitted into the neonatal intensive care unit mostly for perinatal asphyxia [16 (69.6%)], whereas 6 (26.1%) suffered early neonatal death. The perinatal mortality rate for the study was 333/1000.

Conclusion: Modern antenatal care, early presentation and complication readiness for prompt emergency care by the health facilities will improve perinatal outcome from cord prolapse.

Keywords: Birth asphyxia, cord complication, obstetric emergency, umbilical cord prolapse

INTRODUCTION

Umbilical cord prolapse, an emergency obstetric complication, refers to the presence of the umbilical cord below the presenting part of the foetus with ruptured membranes. It is associated with high perinatal morbidity and mortality; the prevalence is between 0.14 and 0.62%.[1-5]

The risk factors for umbilical cord prolapse include foetal malpresentation, low birth weight, preterm delivery, multiple pregnancy and multiparity.[6-8] Successful management is predicated on early presentation, prompt diagnosis and quick decisive intervention to improve foetal survival. The diagnosis is clinical, involving palpation of the umbilical cord below the presenting part with absent foetal membranes. In case of cord prolapse, immediate delivery is most advisable; however, pressure of the presenting part on the umbilical cord must be relieved. The delivery options depend on the state of the foetus and the cervical dilatation; with a dead foetus, labour is allowed to progress to vaginal delivery unless contraindicated. For a live foetus in the second stage of labour, instrumental vaginal delivery is recommended, whereas emergency caesarean delivery is performed in the first stage of labour.[6,9] The study aimed to

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determine the clinical presentation and perinatal outcome following cord prolapse.

MATERIALS AND METHODS

This was a retrospective (descriptive) study of women who presented with umbilical cord prolapse at a tertiary centre. The inclusion criterion was diagnosis of foetal umbilical cord prolapse after foetal viability (28 weeks gestation) with or without onset of labour irrespective of foetal viability. Women without cord prolapse or those with cord prolapse before foetal viability were excluded from the study.

Umbilical cord prolapse was diagnosed clinically by palpation of the umbilical cord below the level of the presenting part with or without its protrusion to the exterior with absent foetal membranes. Women who had confirmation of foetal demise and no contraindication to vaginal delivery were allowed vaginal delivery. Women with live foetuses as evidenced by positive umbilical cord pulsations or the presence of foetal heart sounds in the first stage of labour had emergency caesarean delivery.

In women with live foetuses, pressure on the umbilical cord was alleviated by replacing the cord high in the vagina in those with protrusion out of the vagina; all the women had the maternal urinary bladder filled with 500 ml of normal saline until delivery. The diagnosis-to-delivery interval was the time interval from the diagnosis of foetal umbilical cord prolapse to the delivery of the foetus. Institutional approval was obtained for the study, and data were analysed using Microsoft Office Excel 2010 worksheet and depicted using tables.

RESULTS

There were 14,892 deliveries during the study period with 56 women having umbilical cord prolapse, giving a prevalence of one in 266 births or 0.38% of all total births. Only 54 of the 56 case files were available for review, giving a retrieval rate of 96%; these 54 case files were included in the analysis.

Table 1 shows the modal age of the participants as 30–39 years [27 (50.0%)]. Majority of the participants were multiparous [23 (42.6%)], and 39 women (72.2%) presented at term, whereas 39 (72.2%) had a single risk

Table 1: Bio-social characteristics, risk factors, evaluation at presentation and modes of delivery

Parameter	Frequency (%)	Parameter	Frequency (%)
Age (years)		Umbilical cord location	
≤19	6 (11.1)	Vagina	38 (70.4)
20–29	20 (37.0)	Outside the vagina	16 (29.6)
30–39	27 (50.0)	Amniotic fluid	
≥40	1 (1.9)	Clear	18 (33.3)
Parity		Meconium stained	36 (66.7)
0	6 (11.1)	Umbilical cord condition	
1	10 (28.5)	Pulsating	42 (77.8)
2–4	23 (42.6)	Not pulsating	12 (22.2)
≥5	15 (27.8)	State of the foetus	
Gestational age (weeks)		Alive	42 (77.8)
<37	15 (27.8)	Dead	12 (22.2)
≥37	39 (72.2)	FHR at presentation	
Booking status		Absent	12 (22.2)
Unbooked	8 (14.8)	<120	5 (9.3)
Booked at study site	14 (25.9)	120–160	30 (55.5)
Booked elsewhere	32 (59.3)	>160	7 (13.0)
Risk factors		Mode of delivery	
Single risk factor	39 (72.2)	Assisted breech	6 (11.1)
Non-engagement	2 (3.7)	Vaginal	6 (11.1)
Transverse lie	5 (9.3)	Caesarean	42 (77.8)
Prematurity	5 (9.3)	DDI (min) of CS	
Grand multiparity	7 (12.9)	(n = 42)	
Twin gestation	8 (14.8)	<30	7 (16.7)
Breech presentation	12 (22.2)	30–60	34 (80.9)
Multiple risk factors	15 (27.8)	>60	1 (2.4)

CS = caesarean section, DDI = diagnosis-to-delivery interval, FHR = foetal heart rate.

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factor, of which breech presentation [12 (22.2%)] was the most common. The umbilical cord was in the vagina in 38 women (70.4%), cord pulsation was palpated in 42 women (77.8%), foetal heart rate was within normal range in 30 women (55.5%) and 42 women (77.8%) had caesarean delivery. The presentation-to-delivery interval was less than 30 min in seven women (16.7%) and between 30 and 60 min in 34 women (80.9%).

Birth weight was below 2500 g in 13 (31.5%) neonates, and Apgar score was 0–3 in 21 neonates (50.0%) for the first minute, but this was reduced to seven (16.7%) in the fifth minute. A total of 23 (54.8%) neonates were admitted for neonatal intensive care mostly for perinatal asphyxia [16 (69.6%)], whereas 6 (26.1%) neonates admitted to intensive care died [Table 2].

There were 18 perinatal mortalities (12 intrauterine foetal deaths and six neonatal deaths), resulting in a perinatal mortality rate of 33.3% or 333 perinatal deaths per 1000 pregnancies. None of the mothers died.

DISCUSSION

In this study, the prevalence of umbilical cord prolapse was 0.38%, and it occurred mostly in multiparous women, mainly at term with the majority referred from other facilities. Abnormal presentation was the most frequent risk factor, and more number of foetuses had meconium staining of liquor; delivery of live foetuses in the first stage was by abdominal delivery with a short presentation-to-delivery interval. Adequate resuscitation was effective in improving the neonatal condition at delivery, although perinatal asphyxia remains the most common complication.

Table 2: Perinatal outcome and neonatal care of live foetuses with cord prolapse

Parameter	Frequency	Percentage (%)
Birth weight (g)		
<2500	13	31.5
>2500	29	68.5
Apgar scores (first minute)		
0–3	21	50.0
4–6	18	42.5
7–10	3	7.1
Apgar scores (fifth minute)		
0–3	7	16.7
4–6	15	35.7
7–10	20	47.6
NICU admission		
Yes	23	54.8
No	19	45.2
Indication for NICU admission (n = 23)		
Neonatal sepsis	1	4.3
Prematurity	6	26.1
Perinatal asphyxia	16	69.6
Outcome of NICU admission		
Neonatal death	6	26.1
Discharged home	17	73.9

NICU = neonatal intensive care unit.

The prevalence of umbilical cord prolapse in this study was comparable to a range of 0.14–0.62% that was reported[4-6,10-12] from the studies conducted in Nigeria and other African countries; however, the prevalence was higher than 0.2% in the studies conducted in the United Kingdom.[13] This may be a reflection of the similar facilities for perinatal care and neonatal support in the African region, which are lower than in the developed countries such as the UK. The age was comparatively similar to other reports;[5,6] in addition, late engagement of the foetal presenting part, which is common in multipara with subsequent increased risk for cord prolapse following membrane rupture,[7,9] provided additional risk. Occurrence of cord prolapse was more at term, which was similar to a report involving 71.2% women at term in Maiduguri, Nigeria.[14] This avoids the peculiar challenges of prematurity and offers a greater opportunity for neonatal survival when management is prompt. However, majority of the participants were unbooked or had antenatal care at other facilities and, therefore, presented following referral. Although this may not be unexpected because of the tertiary hospital status of the study site, it may be associated with other logistics including delay before presentation. In addition, some women may present late when referred for caesarean delivery due to the aversion for caesarean delivery, which is common in the developing countries.[15] It is not uncommon to have women in this environment resort to faith homes, traditional birth attendants or local midwives because of counselling for abdominal delivery at the health facility. Other reports from Nigeria[14] and Uganda[12] showed that cord prolapse was more common in women who did not have antenatal care or had them at other facilities. It has been reported that unbooked antenatal status is an important risk factor for both umbilical cord prolapse and perinatal mortality associated with cord prolapse.[6] The common risk factors for cord prolapse in this study such as breech presentation, grand multiparity and prematurity featured prominently as risk factors in other studies.[6,9]

Previous research showed that umbilical cord found outside the uterus is usually compressed by the presenting part leading to hypoxia.[7] In addition, the cord protruding outside the vagina was associated with more deaths compared with those palpated in the vaginal canal.[9]

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Cooler temperatures and exposure to the environment result in vasospasms of the umbilical cord vessels leading to foetal hypoxia.[9] This may have contributed to the foetuses that were dead before presentation and those requiring neonatal intensive care after delivery.

Caesarean delivery is high with cord prolapse; the caesarean delivery rate of 77.8% in this study was comparative to 72.5% reported from Uganda.[12] The American College of Obstetricians and Gynaecologists recommends that in umbilical cord prolapse, obstetrical units should be capable of initiating a caesarean delivery within 30 min of the decision to perform the procedure.[16] However, most centres in Africa have largely been unable to meet this standard, with less than 50% compliance from Nigeria[17] and Uganda.[12] The delays revolve around bureaucracy, cost of purchasing materials needed for the procedure, logistics at operating theatre, poor electricity supply and time spent before obtaining informed consent from the patient or the partners. In many developing countries, after overcoming the many obstacles to get to health facility, getting there may not be enough to avert disaster. A national survey of maternal near-misses and mortality in Nigeria reported that the median time between diagnosis and critical intervention was 60 min, whereas intervention was after 4 h in 21.9% of the participants.[18] The association between low birth weight and umbilical cord prolapse has been reported by previous studies,[10,11] including a five times higher risk among foetuses weighing below 2500 g.[10] Neonatal intensive care admission for intensive care was largely because of birth asphyxia with poor first minute Apgar scores following increased waiting time before delivery. In a report from India with an average diagnosis-to-delivery interval of 18.9 ± 5.8 min, all babies delivered had good Apgar scores post-delivery, and there were no neonatal intensive care unit admissions.[9]

The perinatal mortality rate of 33.3% in this study was similar to 40.3% from Ibadan, Nigeria.[4] These were largely higher than the reported 1.2[10] and 3.9%[5] perinatal mortality rates from the developed countries. This brings to the fore the need for a holistic approach to health service delivery to achieve optimal benefits. Communities with low patronage of modern antenatal care services, poor referral system, late presentation at hospitals, poverty, unavailable health insurance and facilities poorly prepared for emergencies remain at high risk for morbidity and mortality.

CONCLUSION

This study concludes that neonatal morbidity and mortality modern antenatal care, good referral system, early presentation and complication readiness at health facilities may improve outcome from cord prolapse in low-resource countries.

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Conflicts of interest

There are no conflicts of interest.

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