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A 5-year review of obstructed labour and its sequalae in the Federal Medical Centre, Yenagoa, South-South, Nigeria

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Abstract
Background: Obstructed labour is associated with significant maternal and perinatal morbidity and mortality.
Objective: To determine the incidence of obstructed labour and its maternal and perinatal outcomes.
Materials and Methods: This retrospective survey was carried out between 1st January, 2016 and 31st December, 2020. Data were retrieved, entered into a pre-designed proforma, and analysed using IBM SPSS version 23.0. Results were presented in frequencies and percentages.
Results: The case incidence of obstructed labour from this study was 1.1%. Unbooked status and nulliparity featured prominently in the demographics of the women. The commonest cause of obstructed labour was cephalopelvic disproportion (84.6%). Of all the women, 76.9% were referred from traditional birth attendant's homes. There was a case of maternal mortality.
Conclusion: In view of the significant maternal and perinatal morbidity and mortality observed in our study, the approach to this scourge of obstructed labour should be directed towards prevention.

Keywords: obstructed labour, morbidity, mortality, unbooked, Nigeria

1. Introduction
Obstructed labour is a life-threatening obstetric complication associated with significant maternal and perinatal morbidity and mortality. It is a preventable cause of maternal death. Labour is said to be obstructed, when in spite of adequate uterine contractions, there is arrest in progress due to mechanical factors, and further progress and delivery is impossible without assistance [1]. Obstructed labour accounts for up to 8% of maternal deaths, with these deaths occurring mostly in developing countries [2]. It is one of the five leading causes of maternal deaths, especially in developing countries. This indicates the level of obstetric practice available in those regions. The other major causes of maternal mortality are Haemorrhage, Sepsis, Pre-eclampsia/Eclampsia and Abortions.
The incidence of obstructed labour varies in different parts of the world and even within countries. The World Health Organization reported a global estimate of 3 – 6 cases per 100 live births [3], the higher figure being that of the developing countries. An incidence of 12.2% was recorded in Ethiopia [4], 2% in Sokoto, Nigeria [5], 2.7% in Enugu [6], and 0.78% at the University of Port Harcourt Teaching Hospital [7]. Socio-cultural and economic factors are mainly responsible for the occurrence of obstructed labour [8]. High prevalence of under nutrition, poverty, poor healthcare-seeking behaviour, lack of skilled birth attendants, illiteracy and poor transportation systems contribute to the occurrence of obstructed labour in Nigeria and other developing countries [6, 8, 9]. Nulliparous women, grand multiparous women, and teenagers, with no antenatal care or women being supervised in labour by unskilled birth attendants constitute the majority of women with obstructed labour [7, 8].
The most common clinical risk factor for obstructed labour is cephalopelvic disproportion. Others include abnormal foetal lie/presentation, foetal abnormality like hydrocephalus, soft tissue abnormalities like cervical and vaginal stenosis, pelvic tumours below the presenting part.
Some of the features of obstructed labour are prolonged labour, prolonged rupture of foetal membranes, dehydration, tachycardia, intrauterine foetal death, oedematous vulva, presence of malodorous vaginal discharge, warm vagina, caput and moulding of the foetal head

and difficulty in passing a urethral catheter [1, 10].

The aim of management of a patient with obstructed labour is to promptly relieve the obstruction to reduce the likelihood of complications. Obstructed labour can lead to maternal dehydration, infection, ketosis and exhaustion, hence adequate resuscitation and optimisation of the patient's clinical state before proceeding to the definitive intervention remains the hallmark of the management. The resuscitative measures include maintaining homeostasis by the administration of appropriate intravenous fluids to correct dehydration and electrolyte derangements; intravenous antibiotics to prevent genital tract infection associated with prolonged labour and unsterile vaginal examinations.

The choice of operative treatment depends on the state of the foetus, the state of the uterus, the extent of cervical dilatation, the adequacy of the pelvis and the presence or absence of contraindications to vaginal delivery [1]. Other available options are Caesarean section and symphysiotomy. Where there is foetal death and the cervical os is fully dilated, destructive operations are usually the preferred options. The most common destructive operation performed is craniotomy, followed by decapitation, evisceration and cleidotomy [8]. The incidence of foetal destructive operations varies between 0.2% and 1.6% of deliveries in Nigeria [7, 11] and 0.26% in India [12]. In Nigeria, there has been a significant reduction in the performance of foetal destructive operations and this is attributed to reducing skills and preference of the obstetricians.

In skilled hands and well selected patients, a foetal destructive operation carries less morbidity for the mother as compared to having a Caesarean section (because of the risk of spread of infection into the abdomen at a Caesarean section). However, in many cases, Caesarean section is common or preferred, because most of the attending physicians usually lack the skill to perform a destructive operation [8, 12]. Furthermore, women that had never had their labour supervised by a skilled health personnel are unlikely to seek skilled care in subsequent deliveries and may suffer the morbidities associated with an unsupervised vaginal birth after a Caesarean section [9, 12].

Maternal complications could result from prolonged obstructed labour or the chosen mode of delivery. These complications include electrolyte derangement, chorioamnionitis, uterine rupture, post-partum haemorrhage from genital tract injury or uterine atony, vaginal and perineal tears, puerperal sepsis, urinary tract infection, obstetric fistula, peripheral nerve injuries and maternal mortality [5, 10, 11, 13]. Foetal complications of prolonged obstructed labour include birth asphyxia, birth trauma, neonatal sepsis and perinatal death.

The urethral catheter is usually left in-situ for five to seven days for live baby or ten to fourteen days for dead baby to allow healing of the bladder and urethra, and restoration of the bladder tone. Injury to the bladder and rectum are common occurrences, and may be complicated later by vesico-vaginal and recto-vaginal fistulae respectively. The objective of this retrospective study was to determine the incidence of obstructed labour and its maternal and perinatal outcome in the Federal Medical Centre, Yenagoa, Bayelsa State, Nigeria over a 5-year period.

2. Materials and methods

This retrospective descriptive survey was carried out in the Department of Obstetrics and Gynaecology, Federal Medical Centre, Yenagoa, Bayelsa State, South-South, Nigeria between 1st January, 2016 and 31st December, 2020.

Study population consisted of all the patients that presented with obstructed labour to this health facility during the period under review, and they were all included in this study. All the patients who did not have obstructed labour were excluded from the study.

Data were retrieved from the labour ward, delivery and theatre registers, and patients' folders. These records were entered into a pre-designed proforma, and they included age, marital status, level of education, state of residence, occupation, parity, booking status, complications, maternal and fetal outcome, duration of stay in hospital and total number of deliveries during the period under review. Data were analysed using IBM SPSS version 25.0. Results were presented in frequencies and percentages for categorical variables and mean and standard deviation for continuous variables.

3. Results

3.1 Sociodemographic characteristics of the women with obstructed labour

Fifty-two women were managed in the Department of Obstetrics and Gynaecology, Federal Medical Centre, Yenagoa for obstructed labour in the period under review. These women were all referred to our Centre, and formed part of the 4,571 obstetric patients that were managed in the Centre between 2016 and 2020. Thus, the case incidence rate for obstructed labour was 113 per 10,000 pregnancies. The mean age of the women with obstructed labour was 28.8 years with a standard deviation of 4.8 years (Table 1). Modal age group (32.7%) was 25 – 29 years. Most of the women were married (80.8%), with secondary education (65.4%) and reside in urban locations. Majority (38.5%) were unemployed, and 36.5% of them were traders (Table 1).

Table 1: Sociodemographic characteristics of the women with obstructed labour

Characteristics	Frequency N = 52	Percent (%)
Age Group		
< 25 years	11	21.2
25 - 29 years	17	32.7
30 - 34 years	16	30.8
> 35 years	8	15.4
Mean Age ± SD in years	28.8 ± 4.8	
Marital Status		
Single	10	19.2
Married	42	80.8
Educational Attainment		
Primary	18	34.6
Secondary	34	65.4
Residential location		
Urban	31	59.6
Rural	21	40.4
Occupation		
Trader	19	36.5
Farmer	9	17.3
Artisan	4	7.7
Unemployed	20	38.5

3.2 Obstetric features and risk factors for obstructed labour among the women

More than half (55.8%) of the women were nulliparous, while an equal proportion (21.2%) were both primiparous and multiparous (Table 2). Median parity was 0, with a range between 0 and 6. All the women were unbooked and did not

receive any form of antenatal care in any health facility. Mean gestational age at onset of labour was 38.7 ± 1.3 weeks. Thirty-eight weeks' gestation was both the median and modal gestational age at spontaneous onset of labour among this parturients. Table 2 reveals that more than three quarters (76.9%) of the women were referred to our health facility from traditional birth attendants' homes, where they had undergone multiple abdominal massage sessions and had unsterile vaginal examination,

The main cause of obstructed labour among the women was cephalopelvic disproportion (84.6%) and the median duration of labour is 43.5 hours with a range between 25 and 84 hours (Table 2). Figure 1 showed that the mean duration of labour was significantly (t = 2.48; p – 0.017) higher among women referred from traditional birth attendant homes (49.1 ± 18.1 hours) than women referred from other health facilities (35.6 ± 9.7 hours).

Table 2: Obstetric features and Aetiology of obstruction among parturients

Characteristics	Frequency N = 52	Percent (%)
Parity		
Nulliparity	29	55.8
Primiparity	11	21.2
Multiparity	11	21.2
Grand-multiparity	1	1.9
Median parity (Range)	0 (0 – 6)	
Booking Status		
Unbooked	52	100.0
Referring centres		
Traditional Birth Attendant	40	76.9
Primary Health Centre	8	15.4
Private Clinic	1	1.9
General Hospital	3	5.8
Gestational age at onset of labour		
36	2	3.8
37	6	11.5
38	18	34.6
39	9	17.3
40	12	23.1
41	5	9.6
Mean GA ± SD in weeks	38.7 ± 1.3	
Causes of Obstruction		
Cephalopelvic disproportion	44	84.6
Abnormal lie and presentation	8	15.4
Median duration of labour (range) in hours	43.5 (25 – 84)	

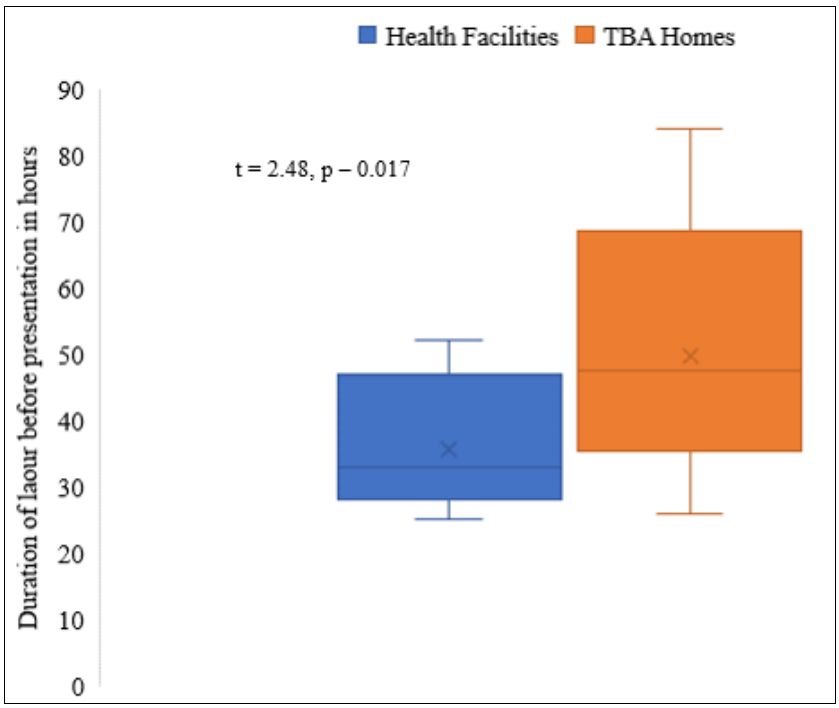

Fig 1: Box plot comparing average time spent in health facilities and TBAs before referral

Complications of obstructed labour in the women

Table 3 shows that maternal exhaustion (65.4%), sepsis (9.6%) and uterine rupture (3.8%) were maternal complications already established from the referring centres. Foetal complications include foetal distress (32.7%) and intrauterine foetal death (23.1%).

Management of obstructed labour

All the women had emergency Caesarean section, with 69.2% of the women having regional anaesthesia (subarachnoid block). Mean duration of catheterization was 9.3 days with a standard deviation of 3.4 days. Duration of hospital stay ranged between 5 and 28 days with a median of 10 days.

Table 3: Complications and management of obstructed labour

Characteristics	Frequency N = 52	Percent (%)
Mode of Delivery		
Emergency Caesarean section	52	100.0
Type of Anaesthesia administered		
Sub-arachnoid block	36	69.2
Total intravenous anaesthesia	16	30.8
Mean duration of Catheter	9.25 ± 3.41	
Median hospital stay in days	10.0 (5 – 28)	
*Complications in labour		
Maternal complications		
Uterine rupture	8	15.4
Chorioamnionitis	5	9.6
Maternal exhaustion	34	65.4
Foetal Complications		
Foetal distress	17	32.7
Intrauterine foetal death	12	23.1

*More than one option applies

Maternal and foetal outcomes following obstructed labour

Table 4 shows that one (1.9%) of the women died as a result of complications following obstructed labour. Maternal morbidity included anaemia (13.5%), wound infection (13.5%) and wound dehiscence (9.6%).

Eventually, 18 (34.6%) cases of perinatal death were reported. About two-third (67.3%) of the babies were admitted into the special baby care unit, 10 (19.2%) of them were managed for severe asphyxia while 8 (15.4%) babies were managed for neonatal sepsis.

Table 4: Maternal and foetal outcomes following obstruction of labour

Characteristics	Frequency N = 52	Percent (%)
Maternal Outcome		
Alive	51	98.1
Died	1	1.9
Maternal morbidity		
Anaemia	7	13.5
Pyrexia	5	9.6
Wound infection	7	13.5
Postpartum haemorrhage	2	3.8
Wound dehiscence	5	9.6
Foetal Outcome		
Alive	34	65.4
Perinatal death	18	34.6
Foetal Morbidity		
SCBU Admission	35	67.3
Asphyxia		
Mild Asphyxia	10	19.2
Moderate Asphyxia	17	32.7
Severe Asphyxia	10	19.2
Neonatal sepsis	8	15.4

Discussion

The case incidence rate for obstructed labour in our study was 113 per 10,000 pregnancies or 1.1%, and this is similar to the 1.08% reported by Rather *et al.* [4] in a tertiary facility in India. Albeit, our finding was lower than the reported rates of 1.79% to 4.98% in similar studies conducted in Nigeria, [6, 15-18] but higher than the 0.8% [10] reported in Kano and 0.78% [7] in Port Harcourt, for which the authors ascribed low rates to improving antenatal care and early presentation in labour. Our finding also, was better than the 3.61% reported by Shaikh *et al.* [19] in India, 10.6% reported by Kabakyenga *et al.* [20] in South-West Uganda and the 12.2% reported by Fantu *et al.* [4] in a tertiary facility in Ethiopia. The observed variations in incidence rates reported may be due to differences in sample sizes and duration of studies. Obstructed labour, thus constitutes a significant threat to both maternal and newborn well-being, especially in resource-limited settings.

Risk factors for obstructed labour identified in this study such as nulliparity and unbooked status have been similarly reported in other studies in Nigeria [16] and other developing countries. Unsurprising, was the finding that all the patients that had obstructed labour in our study, were unbooked, did not receive supervised antenatal care, and were referred mainly from traditional birth attendants' homes. This finding was similar to that reported in another tertiary facility in Southern Nigeria were all the patients with obstructed labour were unbooked [7]. However, it was higher than most reported studies in Nigeria [10, 16, 21, 22], and is a reflection of the possibility of strong traditional beliefs, poor healthcare-seeking behaviour and preferences to deliver at TBAs' homes. These have been similarly reported in an earlier study [23] in this Centre, and maybe somewhat peculiar to the environment where this study was conducted. Unbooked status and deliveries at TBAs have consistently been associated with significant maternal and perinatal morbidity and mortality in our Centre [24-26]. Our finding, however, supports already existing literature that suggests obstructed labour is predominantly a peril of the unbooked mother [27].

Additionally, our findings revealed that in these women with obstructed labour most were either unemployed or engaged in petty trading. This brings to bare the enormous impact unemployment and low socioeconomic status have on women, and may plausibly be a remote reason for patronising the more 'pocket-friendly' often familiar but unskilled traditional birth attendants in our setting. None of the women in our study had tertiary level of education. When a woman is educated, she tends to recognise danger signs early, and seeks help before complications set in. A Ugandan study [20] found that women who lacked paid employment and were subsistence farmers were at increased risk of obstructed labour. It may therefore, though debatable, imply that education alone without financial enablement of women may not be the only 'magic bullet' in the prevention of obstructed labour. It is also worth mentioning, that although less than a quarter of referrals were from Primary Health Centres, in order to mitigate the effects of obstructed labour at the rural community level, our findings underscore the need to conduct trainings on Emergency Obstetric and Newborn Care (EmONC) to improve skill competency among primary health workers and make available some specialised professional services at the level of PHCs.

The median duration of labour, in our study was 43.5 hours, hence the clinical presentations observed were reflective of prolonged periods of starvation and maternal exhaustion as seen in over two-thirds of the women, and a lesser proportion having chorioamnionitis and even uterine rupture. Similar protracted

periods of labour prior to presentation have been reported in other studies in Nigeria [28]. The main aetiology of obstructed labour in this study was cephalopelvic disproportion and accounted for over four-fifths of all cases in this facility. This is consistent with reports across Nigeria [6, 10, 15, 17, 28] and in other developing countries [20, 27]. Furthermore, majority of the cases with obstructed labour in our study spent an of average 10 days in the facility after delivery with need for prolonged catheterization of the urinary bladder for a mean duration of 9 days after delivery. This was done to advert the development of either a rectovaginal or vesicovaginal fistulae. Although none of such complication was observed in our study, vesicovaginal fistulae is a known complication usually among young primipara and has been reported in other studies in Nigeria [16, 29].

Emergency lower segment Caesarean section (LSCS) was offered to all patients irrespective of the viability of the foetus, with most been done under spinal anaesthesia. This was mainly due to preferences of the managing obstetrician to speedily save mother and foetus. Similarly, LSCS have also been the predominant mode of delivery by many other authors both within and outside Nigeria [7, 10, 13, 15, 16, 18]. Besides, it has been reported that regional anaesthesia was found to make LSCS safe and outcomes comparable to that of destructive operation even in moribund cases [30]. Other surgical options in the face of uterine rupture include uterine repair alone, uterine repair with bilateral tubal ligation and hysterectomy, which may be total or subtotal. Some studies highlighted that other destructive procedures like craniotomy were performed although to a lesser extent, as alternatives to LSCS [10, 14-16, 22, 29, 31]. Destructive procedures however, were not performed in this 5-year review either due to a decline in skill or it had 'fallen out of favour' with obstetricians due to increased risk of complications like uterine rupture and litigations as has been similarly reported in another study in Nigeria [32]. Caesarean section rates have continued to increase worldwide. Our Caesarean section rate in this Centre is 42.4% [33], and this is mainly due to unbooked patients referred from TBAs and private clinics. This rate is quite higher than that of a number of Centres [33, 34].

During the study period, there was a maternal mortality rate of 1.9% or 19.2 per 1000 deliveries as one maternal death due to complications following obstructed labour was recorded. She was a 29-year-old multipara with a singleton pregnancy who had been in labour for 82 hours in a traditional birth attendant's place, and presented to our Centre with uterine rupture. She presented in irreversible shock from severe anaemia, and died immediately after surgery in theatre. The findings reported in this study were similar to the rates reported in India [30], but were higher than the 0.78% to 1.0% reported in other studies in Nigeria [7, 10, 16]. The main causes of maternal morbidity observed in our study included wound infection/sepsis, anaemia and wound dehiscence. Our findings are consistent with similar reports in other studies in Nigeria [7, 16, 22, 29]. Uterine rupture, a feared complication of obstructed labour was 15.4% in our study, and slightly higher than 13.17% [16] in Maiduguri, and lower than 17.9% [29] in Uyo and 20.2% [15] in Sokoto. The plausible explanation for our rate being lower than that of Uyo and Maiduguri is most likely because over half of the women that presented with obstructed labour in our study were nulliparous. Uterine rupture as a complication of obstructed labour has been more commonly reported in multi- and grand multiparous women [16, 29].

This study also showed that obstructed labour was responsible for about one-third (34.6%) of perinatal deaths, hence, giving a perinatal mortality rate of 346 per 1000 deliveries. This was similar to the perinatal rates of 333 per 1000 [29] deliveries in a tertiary facility in Uyo, Akwa-Ibom State, South-South Nigeria, 30% [6] in Enugu state, South-East Nigeria and 34.15% [16] in a tertiary facility in Maiduguri, North-East Nigeria. It however, was lower than the 40.2% [7] in Port Harcourt, 46.9% [18] in Jos, 52.9% [10] in Kano and 628 per 1000 [17] deliveries in Gombe. High rates of admission into the neonatal intensive care have been documented among babies born following obstructed labour, the world over. We similarly noted in this study that over two-thirds of babies were admitted into the special care baby unit for mainly asphyxia-related complications whereas less than a fifth were admitted for neonatal sepsis. The poor perinatal outcome usually arises from a combination of intrauterine hypoxia and neonatal sepsis from delayed presentation and prolonged hours of labour. Besides, the resulting stillbirths and birth asphyxia have similarly been reported to be the predominant perinatal outcome of babies born from mothers with obstructed labour by other authors [14, 16-18, 29, 30].

Although, this study is limited by its observational retrospective nature, it has shown that obstructed labour is still relatively common in our environment. Furthermore, it highlights the associated adverse maternal and perinatal outcomes when preventive measures like supervised antenatal care, early referrals for high-risk pregnancies and immediate new born care interventions are not offered promptly. Therefore, there is need for not only health education of the populace on need to assess healthcare facilities but to also economically empower women to help mitigate the delays that hinder utilization of health facilities when complications arise. Lastly, training of traditional birth attendants especially in the use of the partograph in the management of labour to improve their awareness of pending complications, to enable them refer patients early. Traditional birth attendants should have a minor basic education to be able to comprehend the challenges of parturients and attendant complications during child-bearing.

Conclusion

Obstructed labour is a preventable major obstetric problem, especially in resource-poor countries like Nigeria. Poor and delayed seeking of life-saving maternal health services as well as other socio-demographic and cultural factors impact strongly on its occurrence. The sequalae can be life-threatening and life-disabling. Therefore, to address this, concerted collaborative efforts must be put in place to promote health service uptake during pregnancy, delivery in places with skilled/trained midwives or TBA, enhance the referral processes and provide the needed support to seek and receive care early. Maternal health education and financial empowerment schemes should also be prioritised to have supervised antenatal care and hospital delivery, as these will enable prompt diagnosis of cephalo-pelvic disproportion and prevent prolonged obstructed labour and its sequalae. When women are educated and empowered, they recognise danger signs early and seek medical help even in the absence of their spouse.

Limitation

This study is limited by the fact that it is a single Centre hospital-based study. Therefore, may not reflect what is obtainable in the general population of pregnant women.

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Conflict of interest
The authors declare that there are no conflicts of interest.

Authors' contributions
PCO conceptualised and designed the study, collated data, wrote the introduction and results, and the first draft of the manuscript. DOA wrote the protocol of the study, participated in writing the discussion, and supervised the entire research. DCB managed literature searches and wrote the discussion. MNC wrote the abstract and participated in literature searches. UIM participated in writing the introduction. CI and JIA participated in literature searches. AG collected the data for the entire publication. All authors read and approved the final manuscript.

Ethical approval
The research work was examined and approved by the hospital research and ethics committee.

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