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Socio-Cultural and Economic Influence in the Incidence of Obstructed Labor: 5 Years Review in NDUTH

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Abstract:
Background: Despite advances in the reduction of maternal morbidity and mortality in the developed world, obstructed labor is still a major cause of prenatal mortality, morbidity, and one of the preventable causes of maternal morbidity and mortality in developing nations. Africa, most particularly sub-Saharan region has the highest morbidity and maternal mortality in the world. Though exact figure underestimated, WHO estimate at an average of about 1,000 deaths per 100,000 live births.This study aims to determine the pattern of obstructed labor in our environment, to investigate the role of individual and health facility factors, socio-economic impact, as well as examine its contribution to perinatal and maternal morbidity and mortality in South-South Nigeria
Methods: A retrospective hospital-based, cross-sectional study of medical records of 141 Cases of obstructed labour was carried out in all pregnant women who were admitted and delivered in the labor ward of Niger Delta University Teaching Hospital from the 1st. of January 2009 to 31st. December 2013. The data used were collected based on questionnaire and checklist of the information analyzed. We implore the EPI info version 7.1.4.0
Result:
Over a five year period between (2009-2013) 141 cases of obstructed labour were recorded while 2,815 deliveries were conducted giving an incidence of 5.0%. The minority the patients (22.9) were primigravidae, the mean number of delivery in the study was 2.1±2.2 std. children. Abdominal massage during pregnancy prior to admission was (65.2%).Patronage of traditional birth attendant (TBA) places before presentation was (62.9%) and different forms of delay was noticed in (70.21%). The incidence of obstructed labour was much higher for the unbooked patients (75.7%) than for the booked. Cephalopelvic disproportion was the greatest cause of obstructed labour (73.05%), while Caesarean section was the main method of delivery (87.1%). The leading complications of obstructed labour were postpartum haemorrhage (62.41%) followed by puerperal sepsis (49.65%), patient with anemia on admission before surgeries/delivery (53.192%), uterine rupture (20.57%), injury to the bladder (12.77%) and genital tract laceration (2.8%). All patients received antibiotic therapy, while there were thirty still births giving perinatal mortality rate was 212 per 1000 live births. There were two maternal deaths giving a case fatality ratio of 14 per 1000 delivery.
Conclusion: The complications caused by the obstructed labor was very high, so the incidence, it was also noticed that large proportion of the patients are un-booked, and primarily visited traditional birth attendance places, or underwent abdominal massage prior to presentation. The antenatal care follow-up practice was also found to be low. Improvement of our antenatal care coverage, good referral system, adequate governmental support, good education, and empowerment of the female child and availing comprehensive obstetric care in nearby health institutions are better tools recommendable to prevent or reduce obstructed labor and its complications.

Keywords: *Obstructed labor, cephalo-pelvic disproportion, uterine rupture, late presentation, abdominal massage, un-booked*

1. Introduction

Obstructed labor accounts for substantial cause of maternal morbidity, mortality; it is also one major cause of prenatal morbidity, and death. Most of this event occur in low income countries and accounts for approximately 8% of maternal deaths globally [1]. Maternal mortality stands a serious tragedy in any country, 99% of maternal mortality, morbidity occurs in developing countries, and close to 65% occur in just eleven countries; Afghanistan, Bangladesh, Ethiopia, India, Indonesia, Democratic Republic of the Congo, Kenya, Nigeria, Pakistan, Sudan, and Tanzania [2]. Obstructed labour is among those factors leading to the high rate of maternal morbidity, mortality. OL is defined by WHO (World Health Organization) as labour in which the presenting part of the fetus cannot progress into the birth canal, despite adequate uterine contraction [1, 2]. Factors influencing the incidence of OL in these communities maybe attributed to childhood under nutrition and early marriage are common resulting in small pelvis. Despite this, inadequate manpower, good social and health facilities, and not easy to access those functioning health facilities with the capability of carrying out operative deliveries are also contributory factors. [1,3]. Obstructed labor also causes significant maternal morbidity mainly due to infection and hemorrhage and in the long term leads to obstetric fistulae, according to the United Nations Population Fund (UNFPA), as many as a58 million women are estimated to have suffered from obstetric fistula; and another estimate of 30,000 to 130,000 new cases develop each year in Africa alone. It is a devastating condition for women, who are often neglected in their societies; others like skeletal and neurologic complications and fetal death from asphyxia is also common [3, 4, 5]. The incidence of obstructed labor in this study was 5%. Different studies done in other developing countries shows incidence of obstructed labor varying from as low as 0,78% in Port Harcourt, Nigeria, 3.2% by Aboyeji et al, in Ilorin, 4.7% by Ozumba et al in Eastern Nigeria,1.3% in a Sudan. Meanwhile, a higher incidence was reported 7% in a retrospective study done at Jimma University Specialized Hospital (JUSH) and 10.5% by Jerome KK et al [1, 3, and 21]. Most of the studies earlier done identify Cephalo-pelvic disproportion being responsible for 80.6% in JUSH, 67% in a Nigerian study, and 41.1% in an Indian study [1, 3, and 5]. Other causes of obstructed labour are socio-cultural, socio-economic and Obstetric causes, malposition and malpresentation. Thaddeus and Maine" [6] presentation of the possible major constrain affecting the menace of obstructed labour; the "Three Delays Model", the chain of factors affecting the outcome of obstructed labour in low-income settings includes; both cultural and socio-economic factors. Adherence to traditional childbirth practices and individual beliefs as well as poverty restricting the family's ability to pay for transport is directly related to delay in seeking skilled care at birth (Delay I) but also in reaching the facility once the decision has been taken (Delay II). "The association between being poor and limited use of health care services is well established although the direction of this association may differ from context to context [6, 7] and very late due to constrains mentioned by Thaddeus and Maine" [6]. "Factors pertaining to the health care system interact in a complex manner, where one set of factors influence the others". The resources and skills may, for example, be available but for various reasons not offered in time (Delay III) consequently discouraging families from seeking care another time due to perceived low quality of care by Jerome KK et al; (Delay I) [7], these situations have not been properly resolved in some part of this continent; just like the South-South Nigeria: where this review is carried out. Many studies had reported different degree of complications associated with obstructed labour and puerperal sepsis, PPH, Uterine rupture, vesico-vaginal fistula, perinatal mortality, morbidity, increased caesarean section. Puerperal sepsis recorded was significantly high in this study as compared with other studies done; 57% in Nigeria, while it was 12.5% in India. Maternal mortality estimates to be from 32/1000 in Nigeria, 91/1000 in JUSH, perinatal mortality 294/1000 in Nigeria, 160/1000 in India and 621/1000 in JUSH, Ethiopia by Shimelis Fantu et.al [9, 10, 11, and 12]. In most studies it is shown that, to overcome the obstacle of labour; caesarean section and destructive operations were offered as alternatives, even though in majority of the cases the fetus is already dead. Although it maybe imperative to avoid caesarean section when the baby is dead, but the consequential complication could not be treated lightly, hence the preference of CS, since the other methods of extraction impose higher risk to patient, like severe sepsis, shock, PPH. With the availability of better antibiotics, better antennal care, and need for rigorous public campaign OL could be drastically reduced, though complete eradication may not be possible. Inadequately developed health care systems including poor infrastructure, poor transportation and poor obstetric services, socio-cultural and socio-economic state are also major contributors to obstructed labour [10, 11, and 13]

2. Subjects and Methods

This hospital-based prospective cross-sectional study was conducted from January 1, 2009 to December 31, 2013 in the Niger Delta University Teaching Hospital, Okolobiri, Bayelsa State, South/South, and Nigeria. This a referral hospital for the state, though due it`s location, most of the laboring mothers come from rural areas where most deliveries are attended at home.

All mothers who were admitted to the labor ward with diagnosis of true labor during the five years study period were included in the study.

Data were collected using questionnaire and check list which contains socio-demographic characteristics of the patients, blood transfusion, clinical features of obstructed labor, factors affecting late presentation, socio-cultural influence of the causes, the mode of delivery and outcome on the mother and baby. Data were gathered by medical interns and residents in department of obstetrics and gynecology from patients' records. The patients were followed through their whole stay in the hospital so as to assess presence and development of complications.

Analysis was done using Epi info version 7.1.4.0 to describe variables and assess associations. Obstructed labor was operationally defined as failure of the presenting part to descend in birth canal despite adequate uterine contractions for mechanical reasons. The diagnosis of obstructed labor was made by the obstetrics and gynecology residents, and consultants working in the hospital

Ethical clearance was obtained from Okolobiri University medical sciences faculty ethical review committee and permission to conduct the study was obtained from NDUTH.

3. Results

During the five years study period; majority of the patients 84(59.57%) were unemployed and 117(83.07%) low educational status or no formal education and belongs to low socioeconomic group, Majority are Ijaws, 131(92.91%) and Christians 116(82.36%), the mean age of patients 28.5±6.2 std. years in Table 1. Also majority of the patients were from rural areas 116(82.36%), whereas 18(12.77%) were illiterate, and 107(75.88%) were unbooked, abdominal massage was done in 92(65.24%) in Table 2. Delays was recorded in 99(70.21%) of the patients, with more than half 75 (53.19%) presented in the delivery room after more than two days unset of labor in table 3. Majority of the patients with obstructed labor were married, and more than half are multipara 75(53.19%), most of the cases 88(62.41%) were referred from Traditional birth attendant places in Table 1, 2. The mean estimated gestational week (age) of the patients was 37.1±9.3 std.weeks. With regard to causes of obstructed labor, cephalopelvic disproportion (CPD) was the main cause in 104 (73.76%) followed by malpresentation which includes (face presentation, breeched presentation) in 12 (8.51%) of the cases, 1(0.71%) was due to cervical distocia, transverse lie were 12(8.51%), deep transverse arrest 11(7.80%), whereas 1(0.71%) was due to abdominal wall weakness in Table 5. The commonest intervention as regards mode of delivery was cesarean section 123(87.23%). spontaneous deliveries formed 18 (12.77 %.) In Table 4. Whereas; 111(78.72%) of the fetuses were born alive and majority had low APGAR score in the first minute 64(57.66%) and were sent to SCUBU, while 30(21.28%) still birth given a perinatal mortality rate was 212 per 1000 births in Table 4 and Figure 3. The mean body weight of the fetuses was 2318±3226.53 std. with the range (2700–5000 grams), whereas 47 (33.33%) of them were macrosomic (≥4000 grams) in Figure 1.The commonest complication of the obstructed labor was PPH 88(62.41%), followed by anemia 84(59.57%), Fever(infection) 61(43.26%). Among injuries incurred ruptured uterus was present in 29 (20.57%) cases, while bladder injury was 18(12.77%).Other common maternal complications were, wound infection 3(2.13%) , maternal death 2 (1.42%), in Table 6. Blood transfusion was initiated in 122(86.52%); with a means units of blood of 1.54±1.5 std. units per patients. Also; 54 (38.30%) had intensive care, most of the patients presented with PROM.132 (93.62%), while all the patients had antibiotic treatment 141(100.00%) in Table 4, 7. Majority of the patients on admission presented with anemia; with PCV 85 (60.28%); while more than ⅔ of the patients were discharged home with the PCV above 30% 108(76.60%) in Table 8. The mean estimated blood loss during surgery was 1017± 651.5 std.mls

Age	**Frequency**	**Percent**	**Cum Percent**
≤20	13	9.22%	9.22%
≤25	28	19.86%	29.08%
≤30	50	35.46%	64.54%
≤35	33	23.40%	87.94%
≥36	17	12.06%	100.00%
Total	141	100.0%	100.0%
Education	**Frequency**	**Percent**	**Cum. Percent**
Higher	24	17.02%	17.02%
No formal	18	12.77%	29.79%
Primary	39	27.66%	57.45%
Secondary	60	42.55%	100.00%
Ethnicity	**Frequency**	**Percent**	**Cum. Percent**
Ijaw	90	63.83%	63.83%
Igbo	19	13.48%	77.31%
Yoruba	5	3.55%	80.86%
Hausa/Fulani	2	1.42%	82.28%
Others	25	17.73%	100.00%
Marital status	**Frequency**	**Percent**	**Cum. Percent**
Married	127	90.07%	90.07%
Single	14	9.92%	100.00%
Occupation			
Employed	16	11.35%	11.35%
Self employed	41	29.08%	40.43%
Unemployed	84	59.57%	100.00%
Religion			
Christians	131	92.91%	92.91%
Muslems	10	7.09%	100.00%
Residence			
Rural	116	82.36%	82.36%
Urban	26	18.46%	100.00%

Table 1: Demographics of patients with Obstructed labor in NDUTH

No. of delivery	Frequency	Percent	Cum Percent
Nullipara	32	22.70%	22.70%
Primipara	34	24.11%	46.81%
Multipara	75	53.19%	100.00%
Mode of last delivery			
SVD	72	51.06%	
SVD and CS	9	6.40%%	
CS	38	26.95%	
Previous obs./gyn. history			
Yes	69	48.94%	
No	72	51.06%	
Referred from TBA Yes	88	62.90%	
Abdominal massage prior to admission	92	65.20%	
Booked patients	34	24.11%	24.11%
Un-booked patients	107	75.88%	100.00%

Table 2: Factors affecting the pregnancy outcome and Obstetrics history of patients in NDUTH

Type of delays	Frequency	Percent	Cum. Percent
Type 1	51	36.17%	36.17%
Type 2	35	24.82%	60.99%
Type 3l	13	9.21%	70.21%
No delays	42	29.79%	100.00%
Duration of labor before presentation			
≤ 1 day	42	29.79%	29.79%
2-3 days	75	53.19%	82.98%
≥4	24	17.02%	100.00%

Table 3: Type of delays encountered before delivery in NDUTH

Events/Conditions/Treatment	Frequency	Percent
Intensive care (Yes)	54	38.30%
Blood transfusion (Yes)	122	86.52%
Antibiotics therapy	141	100.00%
PROM	132	93.62%
PPH	88	62.41%
Fever on admission	61	43.26%
Baby born alive (Yes)	111	78.72%
Still Birth	30	21.28%
SCUBU	64	45.39%
Mode of present delivery		
Caesarean section	123	87.23%
Spontaneous vaginal delivery	18	12.77%

Table 4: Treatment modalities, and outcome in NDUTH

Causes of Obstructed Labor	Frequency	Percent	cumulative percent
Abdominal wall weakness	1	0.71%	0.71%
Breech presentation	4	2.84%	3.55%
Cervical dystocia	1	0.71%	4.26%
Cephalopelvic disproportion	104	73.76%	78.02%
Deep transverse arrest	11	7.80%	85.82%
Face presentation	8	5.67%	91.49%
Transverse lie	12	8.51%	100.00%

Table 5: Causes of Obstructed labor in NDUTH

Intra-postoperative complication	Frequency	Percent
Postpartum haemorrhage	88	62.41%
Anemia	84	59.57%
Infection/sepsis	61	43.26%
Preeclampsia/Eclampsia	11	7.80%
Malaria	3	2.13%
Wound breakdown	3	2,13%
Injuries to organs(Rupture)		
Uterine rupture	29	20.57%
Bladder injury	18	12.77%
Cervix and vaginal injury	4	2.84%
Maternal Mortality	2	1.42%

Table 6: Distribution of maternal morbidity and complications in cases of obstructed labor, NDUTH

Unit of blood transfused	Frequency	Percent	Cum. Percent
1	8	6.56%	6.56%
2	35	28.69%	35.25%
3	32	26.23%	61.48%
4	29	23.77%	85.25%
5	12	9.84%	95.09%
6	6	4.92%	100.00%
All	122	100.00%	100.00%
Antibiotic th.(Cetriazone+Metronidazole /or +Gentamycin or Ceftriazone alone)			
24 hours(single)	12	8.51%	8.51%
3days(double)	31	21.99%	30.50%
3 days(Triple)	27	19.15%	49.65%
5 days(Double)	23	16.31%	65.96%
5 days(Triple)	20	14.18%	80.14%
≥7 days (Double)	18	12.77%	92.91%
≥7 days(Triple)	10	7.09	100.00%

Table 7: Blood transfusion and antibiotics management of patient in NDUTH

PCV on admission	Frequency	Percent	Cum Percent
≤25	14	9.93%	9.93%
26 -29	61	43.26%	53.19%
30-34	55	39.01%	92.20%
≥35	11	7.80%	100.00%
PCV before discharge			
≤25	0	0%	0%
26-29	33	23.40%	23.40%
30-34	69	48.94%	72.34%
≥35	39	27.66%	100.00%

Table 8: Packed cell volume on admission and before discharge of patients in NDUTH

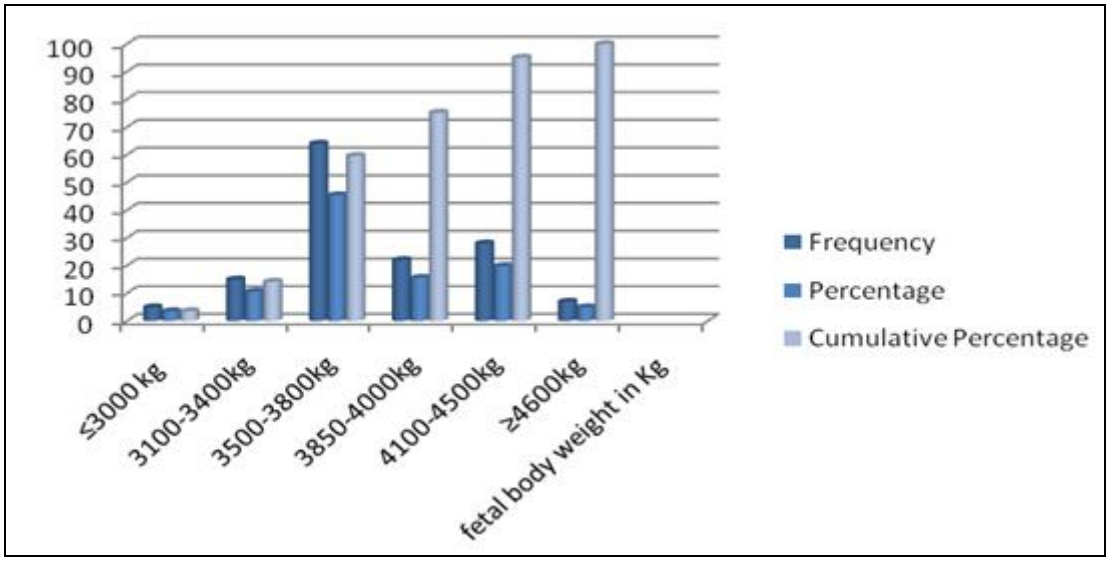

Figure 1: Birth weight of the new born babies with Obl. in NDUTH

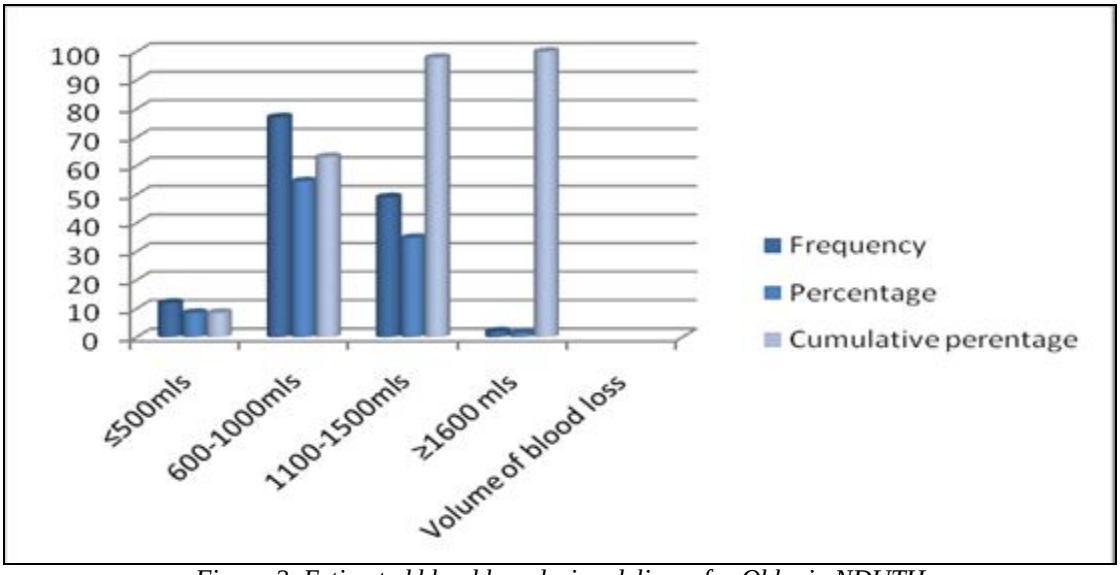

Figure 2: Estimated blood loss during delivery for Obl... in NDUTH

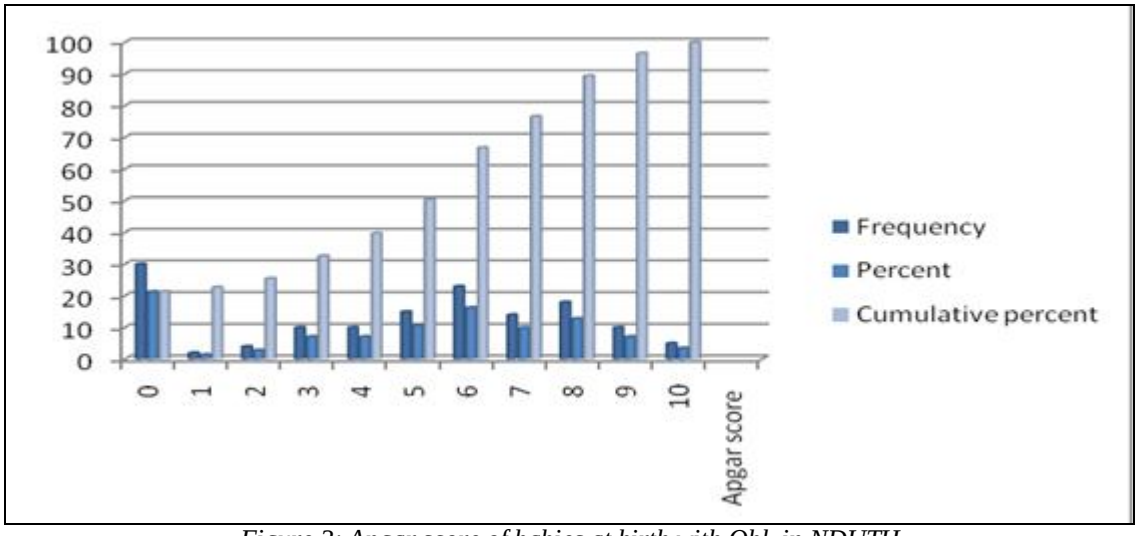

Figure 3: Apgar score of babies at birth with Obl. in NDUTH

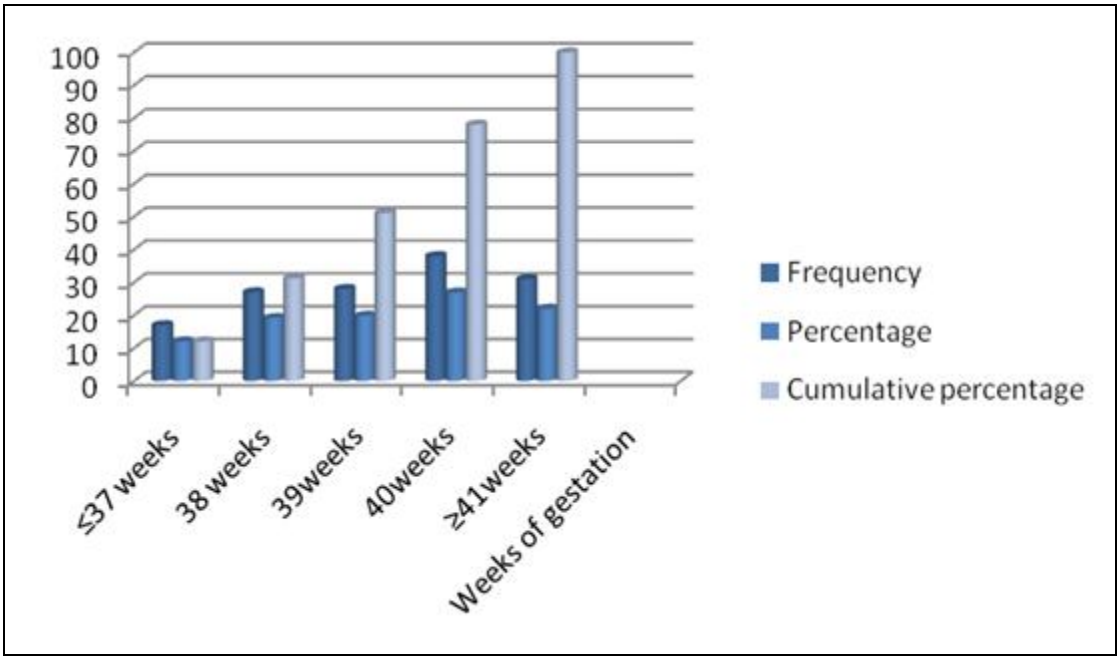

Figure 4: Estimated gestational age on delivery of patients Obl. in NDUTH

4. Discussion

Incidence of obstructed labor in this study was 5.0%; we tried to focus on the various factors influencing the prevalence, incidence of obstructed labor, and its outcomes. It high lightened some of the structural handicaps of our health services and the socio-economic burden inflicted to the community and the country in general. During this review; only two cases of maternal mortality was recorded, some limitation of the study is that; it has not addressed perinatal morbidity, or mortality which is an important indicator of the health sector of the region. The incidence of obstructed labour in this study was 5.0% in 2815 delivery, which is comparatively higher than to those reported from India 2.5%, Hyderabad et al in Pakistan 3.32%, Ozumba BC *et al* Eastern part of Nigeria 4.7%,[10,14,15,16], 4% reported by Melah *et al*. [17] in a study conducted at the Specialist Gombe Hospital (SHG), Gombe State, over a period of 5 years, 3.2% reported by Aboyeji *et al*.[18] in a study conducted in University of Ilorin, Nigeria; but higher than 0.56% reported by Adhikari *et al* in a study in India[19]. Similarly 0.8% was reported by Omole-ohonsi *et al*. in a study conducted in Aminu Kano Teaching Hospital (AKTH), and 1.27% reported by Dafallah *et al*; in a study conducted in a teaching hospital in Sudan [12]. Incidences of obstructed labor were lower than other studies done 10.5% reported by Kabakyenga JK *et al*, 12.2% reported by Fantu *et al* [9]. Although there are records of very low incidence of obstructed labor reported in the literature: the result in our review is in the higher group; despite decreasing trend in incidence noticed in some studies, which is probably a reflection of improvement in antenatal and intranatal care [19]. The high incidence in the absence of other factors is that, this is a tertiary referral Hospital covering a wide catchment area, located in a remote part of the state and most patients referred are already complicated [9]. Most obstructed labour occurred in the un-booked, primgravidae; mostly from the rural low socio-economic class and the grand multiparas also in the same environment and class, who prefer the home delivery conducted by Traditional Birth Attendants, due to socio-cultural, socio-economic and traditional considerations, avoid hospital for antenatal care and intranatal care. Most of these patients are not aware of the dangers, associated with multiparity or none tested pelvic, for these reasons demands adequate health educational program me in this communities; Islam JA et al and Adhikari S et al (2012,2005) [20,21]. In this review one of the most influencing factors and cause of the primary and secondary Delays of the obstructed labor which was recorded in 70.21% of the cases; is as a result of patient health care seeking behavior, patronage of traditional health care providers, and high rate of abdominal massage in view of revising possible causes that could influence normal birth process. No participation of antenatal care services/ unbooked patients/, socio-economic deficiencies, illiteracy, and traditional beliefs. The most frequent cause of obstructed labor in this study were to be cephalopelvic disproportion (73.76. %), transverse lie (8.51%), and malpresentation (8.51%) and deep transverse arrest (7.80%). Similar to other studies; previously done elsewhere 44.8% for cephalo-pelvic disproportion by Islam JA *et al* in Bangladesh. While Cephalo-pelvic disproportion 67.6% and malpresentation in 27.9% Fantu *et al* in Ethiopia, cephalo-pelvic disproportion 57% Dafallah *et al* in Sudan, 56.6% cephalo-pelvic disproportion by Nwogu-ikojo *et al*.in Enugu, Nigeria and 56.7% by Aboyeji *et al*. in University of Ilorin, Nigeria [9, 12, 18, and 20]. The maternal complications observed were uterine rupture 20.57% and sepsis in 43.26%, injuries to the bladder 12.77. %, Post partum haemorrhage 62.41%, wound breakdown 2.13%. Fetal implications and complication, normal Agar score 33.33% %, Low Apgar score 45.39%. Perinatal mortality in this study was 21.28%; which is relatively better than those in other reported cases from various studies: 71% , 38%, Neena *et al*. ,71.3%, Dafallah *et al*. ,27.1%, and Nwogu-ikojo *et al*. 30%.[12,18]. Obstructed labor is a life threatening emergency for both mother and fetus, Hence there is no place for delay or wait and watch policy. [22, 23, 24]. Our study showed, that majority the cases were by LSCS 87.23%, while destructive operations was not done. In other studies done; the cesarean section rate was lower 54.7% by Fantu S *et al* in Ethiopia, 85.94%, 82% by Konje *et al*.

Ibadan, Nigeria. [23]. Incidence of rupture uterus was relatively high; and the ruptured uterus and bladder were repaired, hysterectomy was not performed, as compared with other studies done by Gessessew *et al*. in Ethiopia [8]. Other complications like puerperal sepsis, wound infection, PPH, were similar to those found in other studies[20, 21]. In this study PPH was recorded to be the most frequent complication, while puerperal sepsis was cited by Melah *et al*.[17]; as the most frequent complication, meanwhile wound infection was considered the common complications 34.3% by Aboyeji *et al*. [18].There was no recorded incidence of vesico-vaginal fistula as most patient do not come for follow-up. Two cases of maternal mortality recorded in this study were as a result of complication of postpartum haemorrhage which was 1.42% similar to other studies: were an incidence of 1.6% by Fantu S *et al* in Ethiopia, 3.3% by Nwogu-ikojo *et al* [9, 16, 25, and 26], were reported. During the this review various factors were unfolded; that must have resulted in the high incidence, as majority of the patients are low socioeconomic status in the society, with 59.57% unemployed, antenatal uptake was very low as 75.88% of the patients were unbooked. Most patients were rural dwellers 82.36%, who also patronizes the old fashion of delivery by visiting Traditional birth attendants homes 62.90% and majority had abdominal massage before presentation for labor in the hospital 65.20%.Transfusion was a common treatment of choice as majority of the patients were anemic on admission, with a high incidence of PPH 86.52%, antibiotic therapy was given to all patient due to infection and considering the socio-environmental factors. Therefore; the obstructed labour and the life threatening uterine rupture can be prevented by providing optimal obstetric care [27, 28, and 29]. In resource handicap region and country like ours the used of partograph which is low cost tool for monitoring labour, could avert prolonged labor, as most of this patients are in labour for more than twelve hours[21,27]. Reduction of poverty rate, and female child education, as to improving good nutritional support; as nutrition is essential for normal pelvis development [23]; however it will takes long time to attain the goal[23,24]. Another important potential intervention for the prevention of obstructed labour was well organized antenatal care coverage: despite that, substantial numbers of our patient still prefer the traditional approach [7, 10, and 29]. In this study overall antenatal coverage cannot be ascertained since it only considered patient with obstructed labour. In most cases information regarding the duration of labour was not satisfactory as often labour at home are attended by untrained family members, or Traditional Birth Attendants, who are not very conscious of time. Also in those primary health facilities, or homes there is always lack, or absence of sophisticated fetal and maternal monitoring devices, so cases were evaluated clinically. Uterine activity measurement is not possible and assessment of severity of fetal distress is always almost very inaccurate.

In conclusion; this study revealed high incidence of obstructed labor and its complications as well as low ANC follow-up and delayed arrival to hospital. In order to alleviate these problems, the Ministry of Health and other responsible bodies need to exert efforts to increase the ANC follow-up coverage; so that high risk mothers could be detected, improve functioning of health centers and the referral system as well as scaling up of the transportation system.

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