Profile of Risk Factors Associated with Stillbirth at Western Regional Hospital

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ABSTRACT

Background: Stillbirth (SB) incidents are one of the most common adverse outcomes to occur during pregnancy. Studies indicate that approximately 3.3 million stillbirths are reported annually across the developing world. Institutional registration and under reporting of still birth to an authorized centre is a common problem. **Objective:** The objective of this study is to find out the incidence of SB after 28 weeks gestation and to find out the associated risk factors at Western Regional Hospital of Nepal. **Materials and Methods:** This is a cross sectional study carried out at Western Regional Hospital. Stillbirth babies born after 28 weeks of gestation or birth weight ≥ 1 kilogram and their mothers were recruited for the study. Intrapartum stillbirths were included despite of their ages, races or socio-economic status. Descriptive analysis was done on the data. **Results:** There were 3380 deliveries during the period of study. Among them, 50 cases were stillborn babies with a rate of 14 per thousand deliveries. The major risk factors associated were oligohydramnios, decreased fetal movement, growth restriction, meconium stained liquor and cord prolapse. **Conclusion:** Oligohydramnios (amniotic fluid index < 5cm) was the most common risk factor for stillbirth. Early identification and appropriate perinatal management could help to promote perinatal health.

Keywords: Stillbirth, antepartum, growth restriction, macerated.

INTRODUCTION

Stillbirth (SB) incidents are one of the most common adverse outcomes to occur during pregnancy. Studies indicate that approximately 3.3 million stillbirths are reported annually across the developing world.[1-2] Stillbirth is not only associated with physical and psychological morbidity, but can also remain a significant source of cost for the affected family and community.[3] Many factors can lead to stillbirth, most prominent of which include: congenital infections such as syphilis, malaria, and other maternal acute infections, birth injuries, preeclampsia, eclampsia, poor nutritional status, previous stillbirth, congenital anomaly, and sickle cell disease.[4] Based on a study by Lawn et al., the reported incidence of still birth after 28 weeks has been found to be 5-40 cases per 1,000 births based on various factors such as: geographic regions, socio-economic conditions, and the country's development.[5] Research based on Nepal indicated that about 50% of the total number of stillbirth occurs during the intrapartum period.[6] Stillbirth is a common dilemma faced by many people in the world. Given the prevalence of stillbirth and the negative impact that it can have on the family, it is necessary that the medical community find all preventable measures that can be taken in stillborn cases. Although some risk factors have commonly been recognized in the past, not many studies have attempted to quantify precisely how/what factors can be connected to stillborn conditions. Given that only a handful in-depth profiling and analysis regarding stillborn conditions have been conducted, it becomes obvious that more research in this field is necessary.

World Health Organization defines stillbirth as a birth weight of at least 1000 grams or a gestational age of at least 28 weeks.[7] The majority of stillbirths worldwide (98%) happen in low and middle-income countries, where medical care can be of low quality or unavailable.[8] Stillbirths can be categorized as either antepartum (i.e. occurring before the onset of labor) or intrapartum (i.e. occurring after the onset of labor and before birth). When there is no fetal monitoring to confirm the presence of

a fetal heart rate at the onset of labor, assessment of the skin appearance is frequently used to estimate the timing of the stillbirth.[7] Signs of skin maceration begin around 6 hours after fetal death; therefore, a "fresh" or "non-macerated" appearance of the skin is used as a surrogate measure for an intrapartum stillbirth, whereas a "macerated" appearance is judged as an antepartum stillbirth. However, this assessment may underestimate the rate of intrapartum stillbirths, especially in situations where access to care is delayed.[8]

MATERIALS AND METHODS

This is a hospital based cross-sectional study done at Western Regional Hospital, Pokhara Academy of Health Sciences (PoAHS). Approval for the study was taken from the institutional review committee (IRC) of PoAHS. Verbal informed consent was taken from the participant. Women who gave birth to stillborn after 28 weeks of gestation or birth weight $\geq$ 1 kilogram at WRH were recruited for the study. This cut-off of 28 weeks were enrolled as per World Health Organization definition for still birth.[7] Each woman was studied on an individual basis. The questions were designed so that their socio-economic condition, education, occupation, previous medical and obstetrics history, can be assessed to determine if any of these factors play a role in her stillbirth. Further, medical and laboratory examinations as hemoglobin level, blood grouping and Rh typing, VDRL, HIV, HBSAg, random blood sugar and routine examination of urine were analyzed. The study was conducted from 1st October 2017 to 25th January 2018.

Data entry was done in Microsoft Office Excel 2007 version. Collected data were analyzed by SPSS 17 software. Frequency tabulations of still birth were calculated and associated risk factors and predictors were calculated and analyzed on descriptive way.

RESULTS

There were 3380 deliveries in four months study period, 50 of them were stillborn with a rate of 14 per thousand births. Mothers who gave birth to stillborn babies were 17-40 years old with the mean age of 26.72 years. There were fourteen mothers who were above 30 years old. 33 mothers belonged to rural areas (66%) and 17 mothers from urban areas (34%). 38% of the mothers belonged to low income group and 32% with high income group (figure 1).
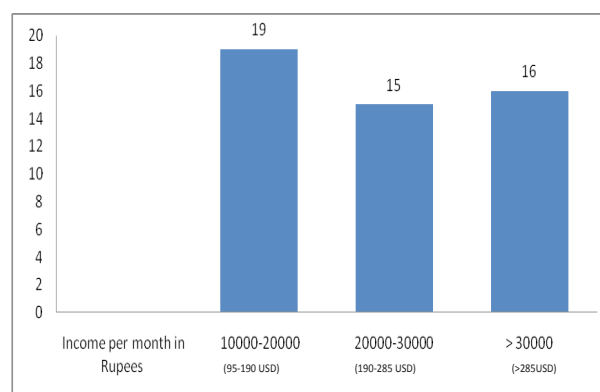

Figure 1 **Family economic status of mother**

Majority of mothers visited regularly for ANC check up. One case visited 8 times and three cases didn't attend for ANC check up even for a single visit (Figure 2).
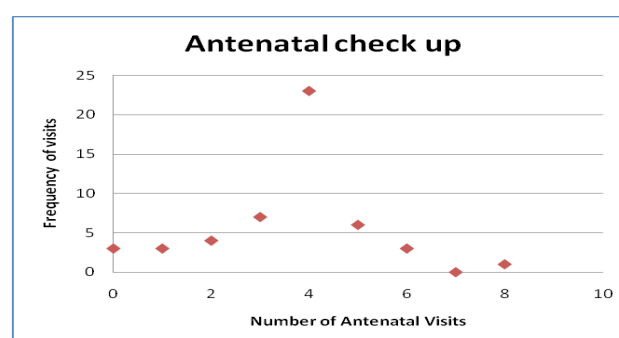

Figure 2. **Frequency of ANC visit**

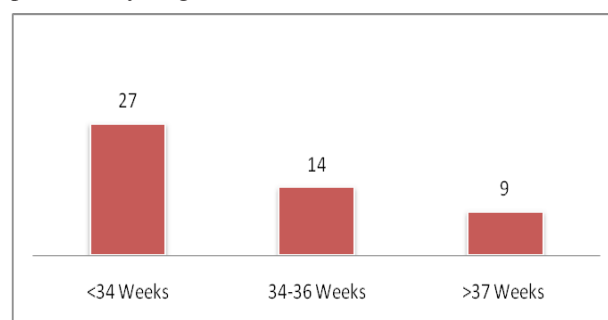There were 41 cases of stillbirths who were born prematurely (Figure 3).

Figure 3. **Gestational weeks of SB babies**

Of the fifty stillbirths, 30 (60%) were macerated and 20(40%) were fresh. Fetal related complications were 32 (62%), placental related 12(24%) and maternal related 7(14%) as stated in figure 4 and Table 1-3.
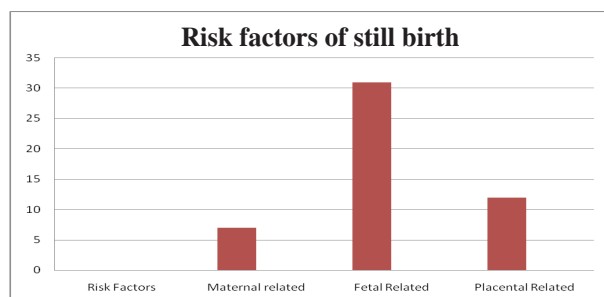
Figure 4. Risk factors classification

Table 1 Maternal risk factors:

Risk Factors	Frequency	Percentage
Pregnancy induced hypertension	2	4%
Maternal chest infection	1	2%
Abnormal Labor (Obstructed Labor)	1	2%
Post term pregnancy (>42 weeks)	1	2%
Maternal chromosomal abnormality (Achondroplasia)	1	2%
Scar tenderness	1	2%
Total	7	14%

Table 2. Fetal risk factors

Risk Factors	Frequency	Percentage
Severe congenital anomaly (Oesophageal atresia)	2	4%
Oligohydramnios	13	26%
Rh incompatibility	1	2%
Growth restriction	6	12%
Decreased fetal movement	9	18%
Total	31	62%

Table 3. Placenta related risk factors

Risk Factors	Frequency	Percentage
Ante partum hemorrhage (APH) (Placenta previa and abruptio placenta)	2	4%
Cord accident (Cord prolapse, cord around the neck)	4	8%
PROM	1	2%
Meconium stain liquor	5	10%
Total	12	24%

Among the all risk factors stated, oligohydramnios was the leading cause for stillbirth (26%) followed by

decreased fetal movement (18%), growth restriction (12%), thick meconium stain liquor (10%) and cord accident (8%). Pregnancy induced hypertension, APH and congenital anomaly contribute 4% each. Obstructed labor, scar tenderness, maternal achondroplasia, Rh-incompatibility and pre-mature rupture of membrane (PROM), post term pregnancy belong to other group, each comprising 2% [Table 1-3]

Figure 5. Overall risk factors
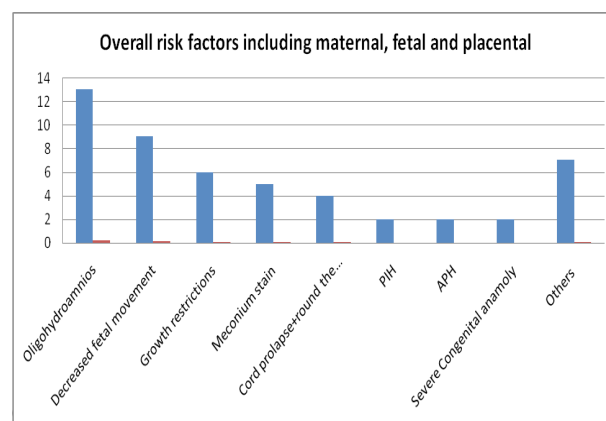
vacuum delivery and four caesarean section (CS).

DISCUSSION

The average stillbirth rate in the United States is approximately 1 in 160 births.[9] In our study the rate of stillbirth per thousand is 14.7 which was quite similar to the study by Shrestha et al. in 2010 in Patan Academy of Health Sciences, Patan Nepal.[10] Stillbirth rate in our study was lower than the stillbirth rate of India (22 per thousand), Pakistan (43 per thousand)[11] and the national stillbirth rate 40 per thousand.[10] In a community based study in Sarlahi districts of Nepal, Anne C. Lee et al.in 2010 found that the still birth rate in these rural area is 35.4 per 1000 births.[12] According to the study, socioeconomic status, ethnicity are the key factors leading to stillbirths in rural areas. In our study group 38% cases were in low socioeconomic status among them 66% mothers living in rural areas. Increased in maternal age is another risk factors leading to stillbirths. Research conducted in Nepal and Bangladesh showed that older mothers above 30 years reported higher stillbirths than the younger mothers.[13,14] Similarly, a hospital-based study conducted in Nigeria also revealed that mothers aged 35 years or older were significantly more likely to report higher rate of stillbirths.[15] Our study comprised 28% (14) mothers above thirty years of age. Higher stillbirth rate in older women has been attributed to the increase likelihood of congenital anomalies, chronic hypertension, placenta previa, uterine rupture, and breech deliveries.[12, 16-18]

This study showed that oligohydramnios is the leading cause for intrauterine death of fetus comprising of 26%. Decreased amniotic volume in prenatal surveillance was associated with increased risk of deceleration in fetal heart beat, increased incidence of cesarean delivery for fetal distress, and lower APGAR scores.[19-20]

Decreased in fetal movement is another leading cause for stillbirth in our study comprising 18% of fetal death.[21] Maternal perception of reduced fetal movements affects up to 15% of pregnancies arising concern and anxiety which can be associated with poor pregnancy outcome.[22-23]

Other major causes are growth restrictions, meconium staining and cord prolapse comprising of 12%, 10% and 8% respectively. Our study revealed that the average weight of stillborn babies was 2.1kilograms which was similar to study carried by McClure et al[4] in 2006. Besides other risk factor including thick amniotic fluid or meconium staining causes aspiration leading to fetal hypoxia and ultimately to intrauterine death.[24] According to research from the Stillbirth Collaborative Research Network, umbilical cord accidents account for around 10 percent of stillbirths [25] which is quite similar as in our study (8%). Abnormal insertion of umbilical cord may lead to vasa previa. With furcated insertion of the umbilical cord, the umbilical cord blood vessels lose the protective cover of Wharton's substance before entering the chorionic plate. Owing to splaying of the vessels and their wide distribution, the vessels are exposed to external trauma. During labor and delivery, they may rupture, twist, and consequently compromise the placental circulation, resulting in stillbirth.[26] Other associated risk factors concurred were PIH, APH, severe fetal congenital anomaly, maternal diseases and other factors which were the similar causes for still birth on another study.[10,16] Ninety four percent of women enrolled in this study had attended hospital at least once for prenatal checkup. Sixty six percentage of women received more than 4 visits of ANC checkup which was similar to study revealed by Imtihaz et al.[27] 6% of cases did not attend even a single ANC visit. Lack of ANC visit may be associated with increased risk of stillbirth.[28]

CONCLUSION

The major risk factors associated with stillbirths in Western Regional Hospital are oligohydramnios, decreased fetal movement, growth restrictions, meconium stain liquor, umbilical cord prolapse, antepartum hemorrhage, pregnancy induced hypertension, severe congenital anomaly, maternal chest infections, Rh-incompatibility, increased maternal age and post maturity.

No conflict of interest.

No human rights violation.

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