ORIGINAL STUDIES

Evaluation of Clinicosocial Factors Associated with Antepartum and Intrapartum Stillbirths at Kathmandu Medical College Teaching Hospital

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Abstract

Objective: To assess the prevalence and biosocial and obstetric risk factors for antepartum and intrapartum stillbirths at a tertiary hospital in Kathmandu, Nepal.

Study Design: A prospective hospital based study during a one year period from 1st November 2007 to 30th October 2008.

Results:18 stillbirths occurred out of the 790 deliveries that took place during the study period giving an overall stillbirth rate of 22.7 per 1000 births of which 22.2% occurred in the intrapartum period. The majority(89.9%) of patients were in the low risk age group, viz. 20-35 years. 62% were overweight, 16% obese and 22% had normal BMI. More than half (56%) were either illiterate or had only primary education and 33.3% were moderate smokers. 66.6% were nullipara and there were no grand multipara in the series. 72% had regular prenatal visits but only 33% presented with a history of loss of fetal movements. 50% delivered preterm and 22.2% were post-term while 66.6% had low birth weights. Hypertensive disorders of pregnancy and IUGR were the leading causes of stillbirths, others being prolonged PROM, cholestasis of pregnancy and congenital anomalies. 11.1% were unexplained and there was one case each of gestational diabetes, antepartum hemorrhage and vaginal breech delivery.

Conclusion: Avoidable intrapartum stillbirths continue to be quite high where timely and appropriate intrapartum intervention must be taken to prevent fetal loss. The identified antenatal risk factors should serve as potential targets for antenatal intervention and due importance of maternal fetal movement scoring must be stressed in the at risk patient.

Keywords: Antepartum and intrapartum stillbirths, gestational diabetes.

INTRODUCTION

A baby's death whenever or however it occurs, is a profound loss. The stillbirth rate is a reflection of health status and policies, socioeconomic indicators related to health and access and adequacy of health care. Ambiguity remains over the precise definition of stillbirth which has been broadly defined as a fetal death in late pregnancy. At what gestational age a miscarriage becomes a stillbirth for reporting purposes depends on the country's policy. The WHO has recommended that national perinatal statistics include fetuses and infants of at least 500 g at birth, alive or dead. The United States and Canada for the most part follow the norm of more than 20 weeks gestation or birth weight more than 500 g although interstate variation exists. Most European countries use the cutoff of 22 weeks pregnancy for registration of stillbirths while England and Wales since 1992 registers a stillbirth after 24 completed weeks. In the developing world, stillbirths are by and large registered when the pregnancy exceeds 28 weeks or the birth weight is 1000 g or more.

In developing countries the reduction of infant and child mortality remains one of the chief objectives of public health programs with little attention being given to fetal mortality. In contrast, most developed countries have been able to achieve such reductions in infant mortality that now late fetal mortality has become a focus of national health initiatives. The reduction of intrapartum stillbirths to 10% or less of all fetal deaths is credited to the availability of effective birth attendants supported by skilled obstetricians, advanced medical technology and specialized institutional facilities.[1]

OBJECTIVE

1. To assess the prevalence of antepartum and intrapartum fetal deaths beyond 28 weeks pregnancy at KMCTH.

2. To identify the biosocial and obstetric risk factors contributing to fetal death in these pregnancies.

STUDY DESIGN

This was a prospective hospital based study of all stillbirths occurring at KMCTH during the period November 1, 2007 to October 31, 2008. Eighteen cases of antepartum and intrapartum III trimester fetal deaths were identified during the one year period. The salient biosocial features analyzed were age, body mass index, literacy, urban *vs* rural population and smoking habits. Clinical aspects like reproductive history, ANC attendance, gestational age, perceived loss/reduced fetal movements, fetal weight, fresh *vs* macerated stillbirths and associated medical/obstetric complications of pregnancy were also assessed.

RESULTS

The total number of deliveries during the study period was 790. The number of stillbirths identified during the period was 18 resulting in an overall stillbirth rate of 22.7 per 1000 births. Of these, 4 were identified as intrapartum fetal deaths which constituted 22.2% of the total stillbirths giving an intrapartum stillbirth rate of 5.06 per 1000 births. This is the category of "avoidable" deaths where timely and appropriate intrapartum services could have helped prevent the occurrence of fetal loss.

The age distribution of the patients was 7 (38%) each in the 21-25 years and 26-30 years age groups, 2 (11.1%) were 31-35 years and 1 (5.5%) each in the < 20 years and >35 years age groups. This reveals that most patients did fall in the obstetric low risk age groups. Various studies have linked maternal obesity with adverse pregnancy outcome. We too attempted to evaluate the association between maternal body mass index and stillbirth. We classified the cases according to body mass index as underweight (BMI <18.5 kg/m²), normal weight (BMI 18.5-24.9 kg/m²), overweight (BMI 25-29.9 kg/m²) and obese (BMI 30 kg/m² or more) (Fig. 1). Our study revealed that 11 (61.1%) were overweight, 3 (16.6%) were obese and 4 (22.2%) had normal BMI. There were no cases in the underweight category. These findings are consistent with numerous reported studies involving much larger study groups emphasizing the need for public interventions to prevent obesity in young women.

Poor literacy being an indicator of socioeconomic and nutritional deprivation was also analyzed. 4 (22.2%) patients were illiterate, 6 (33.3%) had primary education, 3 (16.6%) had secondary education and 5 (27.8%) were graduates. Likewise 12 (66.6%) came from urban areas while 6 (33.3%) were from rural areas. 6 (33.3%) of the patients were moderate smokers. Larger studies have shown a much closer link between

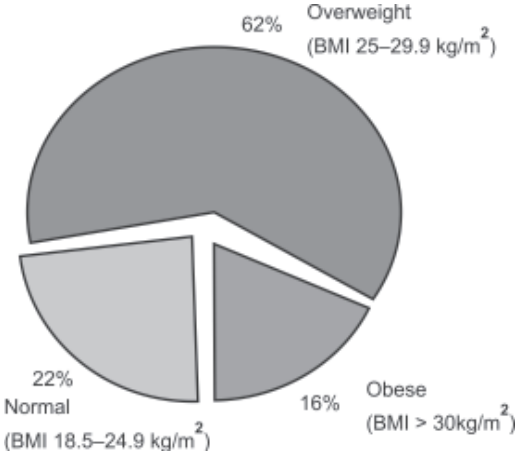

Fig. 1: Association between BMI and stillbirths

poor literacy, smoking habits and rural population with poor pregnancy outcome.

A systematic review of obstetric factors revealed that 12 (66.6%) were nullipara, 4 (22.2%) were para 1 and 1 (5.5%) each were para 2 and para 4. The majority of patients, viz. 12 (66.6%) had no history of previous abortions, 5 (27.8%) gave history of previous one first trimester abortion and 1 (5.5%) had a history of a second trimester pregnancy loss. 4 (22.2%) patients had no ANC visits, 1 (5.5%) had < 4 visits and 13 (72.2%) had regular ANC visits either with us or at other clinics. The gestational age distribution was as follows (Fig. 2): Extreme prematurity (28-32 weeks pregnancy) was seen in 3 (16.6%), prematurity (32-36 weeks pregnancy) was seen in 6 (33.3%) patients giving an overall prematurity rate in the case group of 50%. 6 (33.3%) were 36-40 weeks pregnant, 2 (11.1%) were 40-42 weeks and only 1 (5.5%) was postmature, viz. > 42 weeks pregnant.

Maternal perception of decreased or loss of fetal movements was also assessed (Fig. 3). Only 6 (33.3%) gave a history of loss of fetal movements. 5 (27.7%) had decreased fetal movements

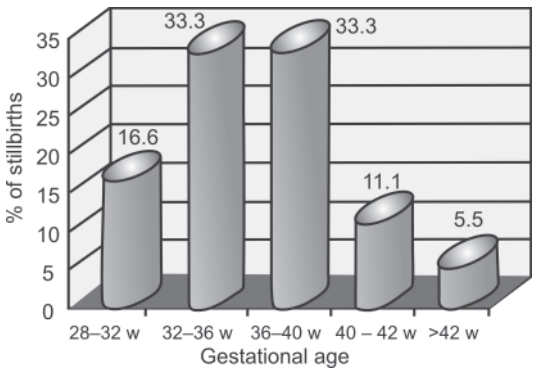

Fig. 2: Stillbirths in relation to gestational age

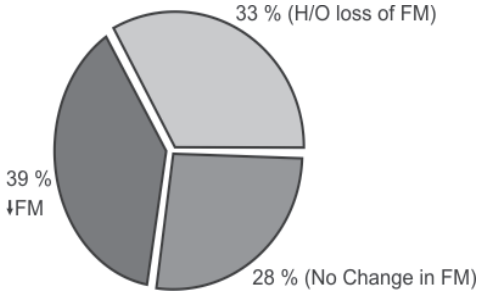

Fig. 3: Maternal perception of chanage in fetal movements

and 7(38.8%) patients had not appreciated any change in fetal movements. This indicates a need to improvise on instructions given to expecting mothers about the importance as well as manner in which fetal movements must be charted especially in high-risk patients.

IUGR is an important risk factor for sudden unexplained intrauterine fetal death and identifying the fetus at risk will impact a variety of adverse perinatal outcomes. 4 (22.2%) of fetuses weighed less than 1500 g, 3 (16.6%) weighed 1501-2000 g, 5 (27.8%) weighed 2001-2500 g giving an overall incidence of low birth weight babies of 12 (66.6%) (Fig. 4). This must be viewed keeping in mind the overall incidence of prematurity in the study group which was 50%. 2 (11.1%) babies weighed 2501-3000 g, 3 (16.6%) weighed 3001-3500 g and 1 (5.5%) had a birth weight of 3600 g. There were no babies in the category above 4000 g. Larger studies, especially western ones have quoted unexplained perinatal deaths in this category particularly intrapartum fetal deaths consequent to abnormal labor patterns as well as intrapartum birth asphyxia.

There were 4 (22.2%) fresh stillbirths indicating intrapartum asphyxia resulting in fetal death. This is the category of avoidable deaths where appropriate obstetric interventions could have saved fetal loss assuming the patient was in hospital soon or before onset of labor. 14 (77.7%) babies were born with signs of maceration indicating fetal death prior to onset of labour. Here one must be reminded that only 6 patients had

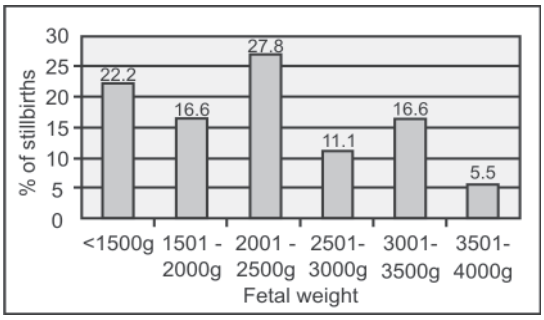

Fig. 4: Stillbirths in relation to fetal weight

reported loss of fetal movements and 5 had perceived a decrease in fetal movements. Finally, a survey of obstetric factors contributing to fetal loss revealed that 4 (22.2%) had hypertensive disorders complicating pregnancy, 3 (16.6%) had IUGR with more than 4 weeks disparity between symphysio-fundal height and gestational age. 2 babies were born with major congenital anomalies, one was anencephalic and the other had gastroschisis. Obstetric cholestasis was noted in 2 patients and 2 had presented with prolonged premature rupture of membranes. There was one case with gestational diabetes only on diet therapy and one had a Type III placenta previa where emergency caesarean section followed by hysterectomy was done for severe antepartum hemorrhage followed by intractable postpartum hemorrhage. Birth asphyxia during vaginal breech delivery occurred in one unbooked primigravida who had presented in the second stage of labor and who delivered a fresh stillborn baby weighing 3600 g following difficulty and delay in delivering the aftercoming head. In 2 patients, there were no obvious clinical risk factors so the etiology of stillbirth was unexplained in 11.1% of the study group (Table 1).

Table 1: Obstetric factors contributing to fetal loss

Obstetric factors	*n*	*Percentage*
Hypertensive disorders of pregnancy	4	22.2%
IUGR	3	16.6%
Congenital anomalies (Major)	2	11.1%
Obstetric cholestasis	2	11.1%
PROM	2	11.1%
GDM	1	5.5%
Placenta previa	1	5.5%
Vaginal breech delivery	1	5.5%
Unexplained	2	11.1%

DISCUSSION

Although this was a small hospital-based study, the results by and large reflect current obstetric experiences in tertiary centers in Nepal. There is little published data to make precise conclusions. Due to inadequate quality of registration of perinatal deaths, larger community-based reports are difficult to obtain. This problem was even expressed in a Danish study[2] which revealed that perinatal deaths could only be classified with accuracy when death certificates were complete and accurate prompting the authors to call for accurate classification of cause of death as well as improvement of local efforts to

complete death certificates more accurately. In our context, national standards for perinatal death audits are still in the making so due consideration must be given to relevant and accurate information which will strongly impact health programming. For reference The Stockholm classification of stillbirth[3] identifies underlying conditions related to stillbirth (primary diagnoses) and associated factors which may have contributed to the death (associated diagnoses). The conditions are subdivided into definite, probable and possible relation to the death. Likewise, the Perinatal Death Classification of the Perinatal Society of Australia and New Zealand (PSANZ) [4] is based on obstetric antecedent factors that initiated the sequence of events leading to the death and provides definitions and guidelines for use.

The stillbirth rate was varyingly expressed in different studies either per 1000 births or as a percentage. The results must be viewed keeping in mind the different definition of stillbirth according to period of gestation and birthweight in different countries as earlier stated. A Swedish study [5] showed that it was highest in primiparas at 38 completed weeks (2.72%), lowest at 40 weeks (1.23%), then increasing to 2.26% in the post-term period. The difference *vs* multiparas was significant from 41 weeks onwards. A population based study in the USA[6] reported the risk of antepartum and intrapartum stillbirths among African Americans to be 5.6 and 1.1/1000 singleton births respectively; risks among whites were 3.4 and 0.5/1000 births respectively. A University Hospital in Denmark[7] quoted an overall stillbirth rate of 4.57/1000 births while in a similar study in a large UK teaching hospital [8] it was 5.9/1000 births of which 92.5% were antepartum. In Qatar Saad et al[9] quoted it to be 8.15/1000 and in Uruguay[10] a study reported a rate of 17.6/ 1000 births. On the other side of the spectrum in developing countries many stillbirths occur at home and the cause of death is not recorded by national health information systems. A study in rural Ghana[11] employing community level verbal autopsy reports an overall stillbirth rate of 34.25/births with 67% occurring in the intrapartum period while in a community based study in rural Sudan.[12] it was 23.9/1000 births and in a Kenyan study[13] it was 23/1000 births. These figures are closer to our own study.

Varying results were seen linking social inequality and deprivation with the incidence of stillbirths. These factors were associated with higher stillbirth rates in a Nordic[14] and an American study[5] while a UK based study[15] could not establish a definite link between individual social class and community deprivation and an increased risk for stillbirths. There is a considerable body of evidence establishing the importance of adequate antenatal and intrapartum care in preventing stillbirths.[16-18] Maternal obesity was shown to more than double the risk of stillbirth by Kristensen et al[6] while no significantly increased risk was found among underweight or overweight women. Advanced maternal age was found conclusively to increase the risk for stillbirths[5, 19] even after accounting for medical disease, parity and race/ethnicity with women 35 to 39 years having a relative risk of 1.32 and women 40 years a relative risk of 1.88. Surkan et al[20] reported that delivery of a previous small for gestational age infant was an important predictor of subsequent risk of stillbirth particularly, if the infant was born preterm.

The significant risk factors noted by Getahun et al[5] in the United States were maternal age > 35 years, lack of prenatal care, BMI > or = 30 kg/m^2, prior preterm or SGA birth as well as congenital anomaly, abruption and cord complications. To quote other American studies, Fretts[21] reported the most prevalent risk factors to be prepregnancy obesity, socio-economic factors and advanced maternal age, Simpson[22] noted that 10% of fetal deaths were related to maternal medical illness such as hypertension, diabetes, obesity, systemic lupus erythematosus, chronic renal disease, thyroid disorders and cholestasis of pregnancy. Of the studies in the UK, Shankar et al[7] noted that half of unexplained stillbirths had a normal antenatal course with no associated factors while of the associated factors identified, IUGR was the most common. Smith[23] reported that the most prevalent independent risk factors were nulliparity, advanced age and obesity while Gardosi et al[24] reported that 72% of unexplained fetal deaths were < 10th percentile.

Infection related deaths, asphyxia and prematurity were the common associations seen in rural Tanzania[25] whereas in rural Sudan[12] teenage pregnancy, multiple pregnancy, primi and grandmultiparity and poor outcome in previous pregnancy especially previous stillbirth were the salient risk factors with frequency of prenatal visits and household income not having a significant impact on pregnancy outcome. The Qatar study [9] reported 9% unexplained stillbirths and 29% unavoidable losses. The major factors contributing to fetal death were IUGR, abruption, congenital anomalies, gestational diabetes and hydrops fetalis.

In conclusion, developing countries like our own where fetal mortality continues to be high require (a) commitment to accurate registration of all III TM fetal deaths so that baseline data are available to pursue appropriate health strategies and monitor progress, (b) focus service delivery measures towards reducing the "avoidable" deaths, viz. intrapartum stillbirths by timely and appropriate intervention where risk factors are identified, (c) early identification and appropriate management

of "at risk" patients for fetal death, viz. IUGR, hypertensive disorders of pregnancy, cholestasis of pregnancy to name a few as well as effective instructions towards fetal movement scoring by the expecting mother in the III trimester.

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