ORIGINAL
PROF-1632

OBSTETRIC OUTCOMES;
SUBSEQUENT TO STILLBIRTH IN THE FIRST PREGNANCY

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ABSTRACT... Objectives: To compare obstetric outcomes in the pregnancy subsequent to still birth with that following live birth in first pregnancy. **Data Source:** Medline data base. **Study Design:** Prospective cohort study. **Setting:** Ghurki Trust Teaching Hospital Lahore. **Materials & Methods:** The study included women who delivered a stillbirth between 2005 - 2007(exposed cohort). A group of women with live birth (unexposed cohort) was matched for delivery within the same year, maternal age (+/- 3 years), parity (+/- 1). In 2009, the charts of these women were examined for subsequent pregnancies. Main outcome measures Maternal and neonatal outcomes in the second pregnancy, pre eclampsia, placental abruption, labour induction, instrumental delivery, caesarean delivery, malpresentation, prematurity, low birthweight and stillbirth. **Results:** The exposed cohort group B (n =50) was at increased risk of preeclampsia (44% versus 28%, p value = 0.001<0.05) and placental abruption (20% versus 2%) and malpresentation (18% versus 4%). labour induction (20% versus 8%) instrumental delivery (16%versus 8%) and emergency caesarean (40%versus 16%); and prematurity (62%versus 26%, p value = 0.001<0.05), low birthweight (86% versus 54%, p value = 0.000<0.05) and stillbirths (6% versus 2%, p value = 0.489>0.05) of the infant as compared with the unexposed cohort group A (n =50). **Conclusions:** Majority of women with a previous stillbirth have a live birth in the subsequent pregnancy, they are a high-risk group with an increased incidence of adverse maternal and neonatal outcomes.

Key words: Intrauterine Death, Obstetric Outcome, Stillbirth, Subsequent Pregnancy.

INTRODUCTION

Pregnancy carries with it a degree of anxiety in the majority of women, even those who have had a positive pregnancy experience in the past. Pregnancy following an experience of intrauterine death does not only induce fear of an adverse outcome in the minds of women and their carers, but also might in fact confer greater risk to the pregnancy, although the evidence on this is conflicting.

Stillbirth refers to the death of a fetus anytime after the 20th week of pregnancy. Stillbirth is one of the most common adverse outcomes of pregnancy. Worldwide, about 3.2 million babies are stillborn each year[1], with 97% occurring in developing countries[2].

Because registries are available in only four percent of the developing world and under-reporting is a common problem[3], it is likely that an additional 1-2 million stillbirths occur, but are not reported.

Stillbirth rates vary by geographic region and socioeconomic status. Rates of 5 per1000 or less are seen in the U.S. and most developed countries while stillbirth rates in the range of 30 to 40/1000 births are common in the least developed countries[4,5]. South Asia has the world's largest numerical stillbirth burden with rates ranging from 25 to 40/1000 births.

Pakistan, reported stillbirth rates vary from 36 per 1000 to 70 or more per 1000 in some rural areas[6,7,8]. In contrast, the World Health Organization (WHO) reports a Pakistani stillbirth rate of 22 per 1000 birth[9]. One reason for the discrepancy among reports is that the lower limit of the gestational age or birthweight varies widely. Many developed countries use 20 weeks as the lower gestational age cutoff for stillbirth. In developing countries, the most commonly used cutoffs are 28 weeks or 1000 grams[10].

A search of Ovid Medline database showed a paucity of data regarding obstetric outcome following still birth.

While most studies have reported increased rates of prematurity, placental abruption, low birthweight and medical intervention to deliver in pregnancies following stillbirth[11] others have found no such increase[12]. The risk of recurrence of stillbirth has been reported to be increased by two- to ten-fold[13,14], while other studies have not demonstrated this increase[11,12]. Studies on outcomes after stillbirth have included cohorts with varying inclusion criteria from those where there is any previous history of stillbirth of any cause, irrespective of parity[11], to case–control matched cohorts for age and parity[12], to only low-risk women with unexplained stillbirth[14]. The likelihood of a recurrent stillbirth depends upon the cause of initial stillbirth.

In order to fully inform our women and healthcare providers regarding expected outcomes of future pregnancies and level of antenatal care following stillbirth, aim was to conduct a prospective study of the affected local population. This would provide us with relevant information in terms of problems to anticipate among our own population, but was also a source of reassurance from relatively positive outcomes. Information regarding outcomes after unexplained intrauterine death is of particular interest.

In this study, we aimed to compare pregnancy outcomes in two cohorts in their second pregnancy (who were therefore matched for age and parity): those who had a stillbirth in their first pregnancy with those who had a live birth in their first pregnancy, to test the hypothesis that stillbirth in an initial pregnancy predisposes women to adverse obstetric outcomes in the next pregnancy.

MATERIALS & METHODS

This is a prospective cohort study. The subjects were women who delivered their first singleton babies between 2005 and 2006 inclusive, and subsequently became pregnant again and delivered by 2009 inclusive. The exposed cohort had an intrauterine death (stillbirth at or beyond 24 completed weeks of pregnancy) in the first pregnancy, while the comparison group delivered a live infant in the initial pregnancy.

Social and demographic factors recorded in the datasheet included age, social class, interpregnancy interval along with detailed obstetric history.

Age was considered as a continuous variable in complete years at the time of delivery. Social class was based on the monthly income of husband.

Outcome variables studied included occurrence of preeclampsia, 'albuminuric hypertension' of varying degrees, this was recoded to include all women of moderate and severe pre-eclampsia plus eclampsia as an individual variable. Antepartum haemorrhage as either abruption, placenta praevia or 'other APH'.These were recoded into individual variables.

Mode of delivery as spontaneous vaginal delivery, varying types of instrumental deliveries, assisted breech or caesarean deliveries. A variable exists as 'type of labour' including, 'spontaneous', 'induced' and 'elective section' which were recorded as separate variables.

Perinatal outcomes included gestational age at delivery, which was simply recorded from number of weeks to those less than 36+[6] weeks and those more than 37weeks, as two separate variables under the headings 'preterm' and 'term'. Both ultrasound (USG) as well as self-reported last menstrual period dates have been used in the database to record gestational age.

Birthweight was recoded from absolute values, to those more or less than 2500 g as a binary variable.

STATISTICAL ANALYSIS

Statistical analyses were conducted using Statistical Package for Social Scientists (SPSS v 14.0).

Pregnancy outcomes were compared using univariate and multivariate statistical analysis.

Continuous variables were compared using Student's t test.

Categorical variables were tested by means of the chi-square test.

Statistical significance was set at a P value of < 0.05.

Table-I. Distribution of age, monthly income and interpregnancy interval of patients (n=100)			
	Group A(n=50)	Group B (n=100)	P-Value
Age(years)	No. of Patients & %age	No. of Patients & %age	
20-25	18 (36.0%)	24 (48.0%)	0.472
26-30	31 (62.0%)	25 (50.0%)	
31-35	1 (2.0%)	1 (2.0%)	
Monthly income			
< 5000	28 (56.0%)	43 (86.0%)	0.001
> 5000	22 (44.0%)	7 (14.0%)	
Interpregnancy interval			
1.0 - 2.0	30 (60.0%)	40 (86.0%)	<0.029
2.1 - 3.0	20 (40.0%)	10 (14.0%)	

RESULTS

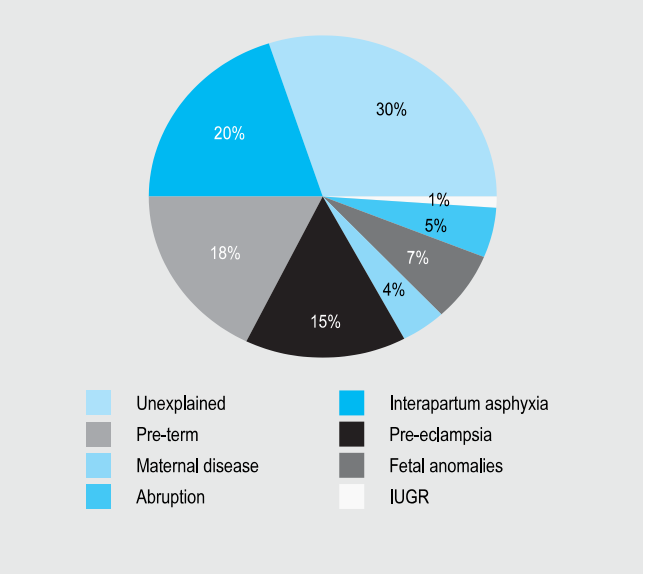
There were 50 women who had had a stillbirth in their first pregnancy and returned with a second pregnancy exposed cohort (group B) while same number women who had an initial live birth formed the unexposed cohort (group A). The obstetric outcome in the subsequent pregnancy of group B is compared with that of group A.

The comparison of the socio-demographic characteristics of the two groups is shown in Table-I. There is no statistically significant difference between the mean ages of the two groups. The mean interpregnancy interval differed in the two groups of women (1.3 ± 0.46) years versus 2.7± 1.35 years, p value = 0.029<0.05. Stillbirth being more common In low income group (86% v 56%, p value = 0.001<0.05).

Figure1 shows the cause distribution of stillbirth in the first pregnancy. Intrapartum asphysia 20%, preterm 18%, per eclampsia15% and in 30%. the cause being unexplained.

Obstetric complications in the two groups are compared and presented in Table-II. The exposed cohort was at increased risk of pre-eclampsia (44% v 28%, p value = 0.001<0.05) and placental abruption (20% v 2%, p value = 0.001<0.05) and malpresentation (18% versus 4%, p value = 0.001<0.05).

Fig-1. Causes of previous still birth in group B (n=50)



The comparison of type of labour and mode of delivery in two groups shown in table-III. In exposed cohort the type of labour was more likely to be induced (20% versus 8%, p value = 0.001<0.05) and mode of delivery was more likely to be instrumental (16% versus 8%, p value = 0.001<0.05) or by emergency caesarean (40%versus 16%, p value = 0.001<0.05).

Table-II. Comparison of antenatal complication (n=50)

	Group A (n=50)	Group B (n=50)
Pregnancy	**No. of Patients & %age**	**No. of Patients & %age**
Pre-eclampsia	14(28.0%)	22(44.0%)
Placenta previa	8(16.0%)	4(8.0%)
Placental abruption	1(2.0%)	10(20.0%)
Malpresentation	2 (4.0%)	9 (18.0%)
Other APH	10 (20.0%)	1 (2.0%)
Others	15 (30.0%)	4 (8.0%)
	P-Value = 0.001	

Table-III. Frequency of labour types and mode of delivery (n=100)

	Group A (n=50)	Group B (n=50)
Labour type & mode of delivery	**No of Patients & %age**	**No. of Patients & %age**
Spontaneous	30(60.0%)	6(12.0%)
Induced	4(8.0%)	10.0(20.0%)
Instrumental	4(8.0%)	8(16.0%)
LSCS	4(8.0%)	6(12.0%)
EMLSCS	8(16.0%)	20(40.0%)
	P-Value = 0.001	

The comparison of fetal outcome shown in tables-IV, V, VI. Risk of prematurity at less than 37 weeks of gestation was increased (62%versus 26%, p value = 0.001<0.05) in the exposed cohort, low birth weight (86% versus 54%, p value = 0.000<0.05) and there were more stillbirths in the exposed group (6% versus 2%, p value = 0.489>0.05).

Table-IV. Comparison of fetal weight in both groups (n=100)

	Group A (n=50)	Group B (n=50)
Fetal weight(kg)	**No. of Patients & %age**	**No. of Patients & %age**
< 2.5	27(54.0%)	43(86.0%)
> 2.5	23(46.0%)	7(14.0%)
	P-Value = 0.001	

Table-V. Frequency of fetal outcome (n=100)

	Group A (n=50)		Group B (n=50)	
Fetal weight(kg)	**No. of Patients**	**%age**	**No. of Patients**	**%age**
Alive	48	96.0	45	90.0
Still born	1	2.0	3	6.0
Neonatal death	1	2.0	2	4.0
	P-value =0.489			

Table-VI. Comparison of gestational ages of the two groups (n=100)

	Group A (n=50)		Group B (n=50)	
Gestational age (wks)	**No. of Patients**	**%age**	**No. of Patients**	**%age**
< 36+6	13.0	26	31	62.0
> 37	37.0	74	19	38.0
	P-Value = 0.001			

DISCUSSION

The results from this study demonstrate that intrauterine fetal death in an initial pregnancy increases obstetric and perinatal complication rates in a subsequent pregnancy. In keeping with other studies[11,12,18,19]. The results show that the risk of low birthweight, prematurity, placental abruption and intervention at delivery are more common and suggest that preeclampsia and malpresentation may be significantly more common following a history of stillbirth.

In developed countries, the risk factors for stillbirth include extremes of age, smoking and being overweight[15]. While the women's risk of stillbirth in developing country settings is low income class, lack of care during pregnancy, poor nutrition and because of some behaviors[16]. The similar maternal risks are also evident in our study.

According to our study the short interpregnancy interval <2 years being a risk factor for subsequent still birth in exposed cohort. The research shows similar results that interpregnancy intervals <2 and > or =4 years after stillbirth increased the risk of ischemic placental disease and spontaneous preterm birth leading to increase adverse perinatal outcomes in subsequent pregnancy[17-19].

Known causes of stillbirth include, among many others, umbilical cord accidents[10]. Fetal anomalies, fetal hydrops, pre-eclampsia and other maternal disease. These are factors that may recur or persist during a second pregnancy. Reports, however suggest that 12–50% of all stillbirths may remain unexplained after investigation.

In our study there is increased risk of preeclampsia placental abruption and malpresentation in the subsequent pregnancy in the women who had a previous stillbirth. These results are comparable with the work done by Robson S et al. Rasmussen S et al and Black M et al[11,20.21].

The findings of an increased incidence of pre-eclampsia, low birth weight and placental abruption in the exposed cohort in a subsequent pregnancy might reflect an underlying impaired placental function and development that might have existed even in the first pregnancy, albeit subclinically and undetectable by investigations, contributing to the stillbirth. It is also in keeping with findings from recent studies show that the risk of subsequent stillbirth is increased even with previous live birth where the pregnancy has been complicated by preeclampsia and small-for-gestational-age birth[22].

The likelihood of a recurrent stillbirth depends upon the cause of initial stillbirth. The risk is low for most couples, though the risk is higher than for couples who have not had a stillbirth. However, the risk for having another stillbirth may be higher if a maternal health condition (such as diabetes) or a genetic disorder caused the previous stillbirth[23].

There is conflicting evidence in the literature on the risk of recurrence of stillbirth. Recent studies have shown pregnancy after stillbirth has a recurrent stillbirth risk of five to ten folds[14,24]. While, some studies have not demonstrated an increased recurrence risk of subsequent stillbirth, but this has mostly been with cohorts where the previous stillbirth has been unexplained[25]. These findings may be useful in counseling pregnant women with a history of stillbirth.

A comparative study was done by Robson S. et al. (2001). They concluded that women who had a previous stillbirth had increased incidences in subsequent births of abnormal glucose tolerance or gestational diabetes, induction of labour and elective Caesarean section; fetal distress and postpartum haemorrhage; and forceps and emergency Caesarean delivery and preterm birth. Gestational age at birth and birthweight were also significantly reduced, suggesting a need for close monitoring of their future pregnancies. However, there was no increase in the rate of stillbirth and no statistically significant increase in the rate of perinatal death or neonatal death. Similar results were also shown by Lurie S. et al.[11,12].

According to our study, the risk of recurrence of stillbirth in the second pregnancy to be almost three times higher in exposed cohort as compared with that of unexposed cohort but no statistically significant increase in the rate of perinatal death or neonatal death. Similar result was reported by Sharma et al. (2007) showing risk of recurrence of stillbirth in the second pregnancy to be almost six times higher in women with a stillbirth in their first pregnancy as compared with those with a first pregnancy live birth. Similar to our study their cohort were only low-risk women (age <35 years, absence of smoking) and including stillbirths from all causes (apart from those due to congenital anomalies) and those

where maternal conditions like diabetes and pre-eclampsia might have contributed to the outcome[14].

CONCLUSION

In conclusion, we have shown that a stillbirth in the first pregnancy does indicate increased risk in the subsequent pregnancy of low birth weight, prematurity, placental abruption, preeclampsia and intervention at delivery, but the risk of a second stillbirth and neonatal mortality is not increased in the absence of known risk factors.

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Article received on: 26/03/2010 Accepted for Publication: 06/04/2010 Received after proof reading: 30/12/2010

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Article Citation:
Yasmeen F, Shami N, Talib W. Obstetric outcomes; subsequent to stillbirth in the first pregnancy. Professional Med J Mar 2011;18(1): 11-17.