Original Article

Risk Factors of Antepartum Intrauterine Fetal Death

Frequency of Maternal Risk Factors Leading to Antepartum Intrauterine Fetal Death in a Tertiary Care Hospital, Karachi, Pakistan

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ABSTRACT

Objective: To determine maternal risk factors leading to antepartum intrauterine fetal death in a tertiary care hospital, Karachi

Study Design: Cross sectional study.

Place and Duration of Study: This study was conducted at the Department of Obstetrics and Gynaecology, Civil Hospital, DUHS, Karachi from April 2011 to April 2015.

Materials and Methods: All pregnant women over 24 weeks gestation and a diagnosis of singleton intrauterine fetal death confirmed by ultrasound scan were included in our study. The exclusion criteria were multiple pregnancy, intrapartum fetal death during labour, a malformed fetus diagnosed on ultrasound scan, a history of maternal trauma or fall, or any pre-existing maternal disease such as asthma, tuberculosis or thyroid disturbance. Informed consent was obtained from all participants and116 female patients were enrolled in the study.Full ethical approval was obtained. Patient demographics such as age, weight and blood pressure were recorded. Blood samples weresent for laboratory assessment. The presence of maternal risk factors such as advanced maternal age, diabetes mellitus, hypertension and obesity was observed.

Results: Our study enrolled 116 females and mean age was 30.14+ 4.98 years .The main maternal risk factors identified in our study were hypertension 44 (37.9%), diabetes 34 (29.3%) antepartum hemorrhage 17 (14.7%) and others 21(18.1%).

Conclusion: Our results suggest that hypertension, diabetes and antepartum hemorrhage are the main risk factors for antepartum intrauterine fetal death. This is unsurprising given the low socioeconomic patient demographic. However, further multi-center observational studies should be conducted with a larger sample size.

Key Words; antepartum hemorrhage, epidemiology, fetal death, hypertension, diabetes, obesity

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INTRODUCTION

Antepartum intrauterine fetal death is defined as fetal death occurring after 24 weeks gestation and before the initiation of labour. [1]This may be caused by a number of risk factors including birth defects, chromosomal abnormalities, infection, injuries, hemorrhage, and uterine problems such as a congenitally malformed uterus.[2] Data on maternal factors in resource-constrained settings that could predict antepartum intrauterine fetal death in women isscarce. One study in Oladapo identified pregnancy-induced hypertension, pre-existing hypertension, reduced weight gain per week, previous antepartum fetal death, antepartum haemorrhage, previous miscarriage, symphysiofundal height and the perception of reduced fetal movements as risk factors for antepartum intrauterine fetal death. [3-4] Fetal deaths are an important component of perinatal mortality occurring either before onset of labour or during labour and delivery (intrapartum).[5-6] Factors associated with antepartum fetal deaths, in particular, include socioeconomic and demographic conditions such as low maternal education, maternal age over 35, high parity, short inter-pregnancy interval and body mass index (BMI >29.0 kg/m^2).[7] Previous unfavorable pregnancy outcomes, premature rupture of membranes, diabetes mellitus, hypertension, and preeclampsia are also thought to play a role. Furhter more, inadequate prenatal care and fetal characteristics such as intrauterine growth restriction and congenital malformations may contribute to antepartum fetal deaths. These factors have shown significant associations in the published literature. Clinical conditions of mother and fetus are the dominant risk

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factors. A consistent proportion of fetal deaths is considered unexpected and unexplained.[8]

The sustainable goal three focuses on global maternal health improvements and seeks to reduce antenatal fetal death by 2030. This study will determine maternal risk factors leading to antepartum intrauterine fetal death in a tertiary care setting in Karachi, Pakistan. We hope the results will help develop strategies to reduce the frequency of antenatal fetal death, in order to improve national indicators in the long term.

MATERIALS AND METHODS

Across sectional study was conducted at the Department of Obstetrics and Gynecology atCivil Hospital, Karachi. A sample size calculation was performed at 26% and ultimately 116 participants were enrolled. Sampling criteria was non-probability consecutive. Inclusion criteria were: pregnant women over 24 weeks gestation and a diagnosis of singleton intrauterine fetal death confirmed by ultrasound scan. Women with multiple pregnancy, intrapartum fetal death during labour, a malformed fetus diagnosed on ultrasound scan, a history of maternal trauma or fall or pre-existing maternal diseases such as thyroid disturbance, tuberculosis or asthma were excluded from our study.

All female participants having antepartum intrauterine fetal death fullfilling the selection criteria were enrolled in the study after informed consent was obatained. Full ethical approval of the study was obtained from the ethical committee of The College of Physicians and Surgeons, Pakistan (CPSP). Patient demographics and basic observations were recorded.These included age, weight and blood pressure (checked four hours apart). Blood tests were also performed and sent for analysis. The obtained information was ccollected ona predesigned proforma.

The collected data was analyzed through SPSS version 15.0. Mean and standard deviation (S.D) was calculated for quantitative data i.e. age, height, weight, gestational age and family income. Qualitative data including the education of patient, hypertension and diabetes was presented as frequencies and percentages. The factors leading to intrauterine fetal death were observed for parity, age and BMI.

RESULTS

A total of 116 women fulfilled the inclusion criteria and were included in the study. The mean age of patients was 37.15± 2.00 years .The mean height was 5.9 ± 2.8 feet and the mean weight was 68.0 ± 6.9 kg. Mean gestational age was 30.8 ± 2.3 weeks, mean BMI was 27.5 ± 0.35. As shown in Table 1, 31 (26.7%) patients had been educated to a level above metric.

Hypertension appeared to be the most common risk factor for antepartum intrauterine fetal death with 43 (37.1%) patients diagnosed as hypertensive. 34 (29.3%) women had diabetes and 17 (14.7%) suffered an antepartum haemorrhage as shown in Fig 1.Hypertensive patients were further analysed by age group.Out of 43patients, 28 (65.1%) patients were between 35 to 36 years and 20 (48.8%) patients had a parity between 4 to 7 and 21 (48.4%) patients had a BMI more than 28.3 kg/m^2. Similarly, of 34 diabetic patients 20 (58.8%) were between 35 to 36 years,22 (66.7%) women had a parity between 1 to 3 and 16 (47.1%) patients had a BMI more than 28.3 kg/m^2.

Table No.1: Demographic characteristics of sample n=116

Characteristics	Mean ± S.D
Age (years)	37.15 ± 2.00
Height (feet& inches)	5.9 ± 2.8
Weight (kg)	68.0 ±6.9
Gestational age (week)	30.8 ± 2.3
Family Income (Rs.)	9402.6 ± 3517.0
BMI	27.5 ± 0.35
Education Status	No (%)
Less than Matric	20 (17.2)
Matric	31 (26.6)
More than Matric	54 (46.5)

Table No.2: Comparison of age, parity and BMI according to risk factors (n=116)

Age groups	**Hypertension**		**Diabetes mellitus**		**Antepartum Haemorrhage**	
	Yes N (%)	**NO N (%)**	**Yes N (%)**	**No N (%)**	**Yes N(%)**	**No N (%)**
35 – 36	28 (65.1)	43 (58.9)	20 (58.8)	51 (62.2)	11 (64.7)	60 (60.6)
37 – 39	9 (20.9)	17 (23.3)	9 (26.5)	17 (20.7)	3 (17.6)	23 (23.2)
.>40	6 (14.0)	13 (17.8)	5 (14.7)	14 (17.1)	3 (17.6)	16 (16.2)
Parity						
1 – 3	16 (39.0)	53 (74.6)	22 (66.7)	47 (59.5)	6 (37.5)	63 (65.6)
4 -7	20 (48.8)	12 (16.9)	8 (24.2)	24 (30.4)	7 (43.8)	25 (26.0)
>8	5 (12.2)	6 (8.5)	3 (9.1)	8 (10.1)	3 (18.8)	8 (8.3)
BMI						
21.0 – 24.6	3 (7.0)	8 (11.0)	3 (8.8)	8 (9.8)	1 (5.9)	10 (10.1)
24.7 – 28.2	19 (44.2)	41 (56.2)	15 (44.1)	45 (54.9)	11 (64.7)	49 (49.5)
>28.3	21 (48.8)	24 (32.9)	16 (47.1)	29 (35.4)	5 (29.4)	40 (40.4)

In the antepartum haemorrhage category, 11(64 %) patients were between 35 to 36 years, 7 (43.8%) patients had a parity between 4 to 7 and 11 (64.7%) patients had a BMI between 21.0 to 24.6 kg/m^2 as shown in Table 2.

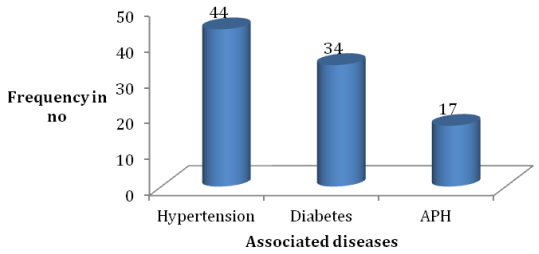

Figure No.1: Maternal Risk factors (n=116)

DISCUSSION

Perinatal mortality is a significant public health problem throughout the world. In developing countries such as Pakistan, its prevalence is alarmingly high due to variousmodifiable factors. Most of the causes are treatable and fetal outcomes can be improved by provision of improved healthcare facilities during antepartum and intrapartum periods and through public education regarding reproductive health, diet and nutrition, exercise and better utilization of health services and involvement with preventative health measures. [9-10]

A study by Sutan in 2009 showed that maternal age of 35 years and above, maternal height of <160 cm and gestational age of above 39 weeks were significantly associated with unexplained antepartum stillbirth. [11-13] The stillbirth rate in Scotland is 5.7 per 1000 births for years 1996 to 2000 and 5.3 per 1000 births for the year 2005.[14-15] Despite the importance of stillbirths, their causes remain unknown in the majority of reported cases due to an incomplete understanding of the physiology of the fetal-placental unit, inadequate diagnostic evaluation, the absence of placental histology and fetal autopsy and poor reporting of associated risk factors as causes. [16-17]

Another study by Paupathy in 2010 studied the association between maternal age and delivery-related perinatal death at term in the UK. Among women in labour at term, age greater than 40 was independently associated with risk of anoxic death among primiparous and multiparous women. The study concluded that advanced maternal age is associated with an increased risk of death due to intrapartum anoxia at term.[18] The common medical disorders with IUFD were hypertension in twelve patients (66.66%), diabetes mellitus in 4 patients (22.22%) and mitral stenosis in two patients (11.11%). [19-20]

CONCLUSION

The perinatal mortality rate, of which intrauterine fetal death rate is an integral part, is one of the best indicators of the quality of medical care offered by a society.

Our study showed that the main factors leading to antepartum intrauterine fetal death were hypertension 44 (37.9%), diabetes 34 (29.3%) and antepartum hemorrhage 17 (14.7%). Most similar studies conducted internationally or nationally have shown comparable results with these factors having more association or correlation in addition to other factors such as obesity and age. In view of the above results we suggest further epidemiological studies with larger sample size, strong study design and multiple factors that may help preventive antepartum fetal death.

Conflict of Interest: The study has no conflict of interest to declare by any author.

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