Associated risk factors with ante-partum intra-uterine fetal death

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ABSTRACT

Objective: To determine ante-partum maternal risk factors for intrauterine fetal death.

Methods: We carried out a case control retrospective study, at the Maternity and Children's Hospital, Jeddah, Kingdom of Saudi Arabia. We included all pregnant women diagnosed as singleton intra-uterine fetal death in the third trimester with fetal weight of 1500 gm and more, admitted to the hospital over a 2-year (2001-2002) period (study group). We examined the following risk factors: diabetes, hypertension, abruptio-placenta, age, gestational age, parity, trauma, sepsis, booking, chromosomal abnormality, previous history of intra-uterine fetal death (IUFD) and intra-uterine growth restriction (IUGR). We compared the results to those pregnant women with live pregnancy admitted before and after each case (control group).

Results: There were 157 cases of singleton IUFD during that period. The intra-uterine fetal death rate was 10.1 per 1000 deliveries. In 28% of the cases, we could not determine the associated risk factors. Among cases there were 57.3% (odds ratio [OR] 2.4 95% confidence interval [CI] 1.4-4) lacking antenatal care, cord accident in 56.6% (OR 5.1% 95 CI 2.7-9.5), 29.3% (OR 5.5 95% CI 2.4-12.6) hypertension, 26.1% (OR 12.9 95% CI 5.5-30.6) diabetes, IUGR in 24.8% (OR 1.73% 95% CI 1.1-2.7), 14% (OR 23.4% 95% CI 4.6-119.3) abruption-placenta, and previous history of IUFD in 8.3% (OR 7.01 95% CI 2.1-23.6). Other risk factors found were age between 20-30 years in 51.6%, gestational age between 37-41 weeks in 58.6%, parity between 0-5 in 77.1%, and chromosomal abnormality in 5.7% (OR 0.91% 95% CI 0.91-0.99).

Conclusion: The identified risk factors for IUFD in our community appear preventable. We should pay attention to health education with emphasis on antenatal care and the benefits of regular clinic attendance. Patient's compliance is important in reducing most of these preventable fetal deaths.

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Ante-partum intrauterine fetal death (IUFD) is a major cause of perinatal death.[1] A population based analysis by Cotzias et al[2] estimated the risk of unexplained IUFD at or beyond 38 weeks to be one in 730 singleton pregnancies. Late fetal deaths currently comprise at least half of all perinatal deaths and more than one third of total fetal and infant deaths in Europe and North America.[2] Despite the evident importance of stillbirth as both a clinical and public health problem, little attention has focused specifically on the epidemiology of fetal death separately from neonatal or infant death.[2] In the developing countries, the bulk of intrauterine deaths are intrapartum and attributed commonly to the avoidable factors.[3] In

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contrast, stillbirth in developed countries is largely ante-partum with no apparent cause.[3] Many fetal deaths can be attributed to maternal disorders, such as diabetes or hypertensive disease, to fetal pathology such as congenital anomalies, severe fetal growth restriction (FGR) or cord accident, and to placental pathology such as abruptio placenta.[4] For the purpose of our study, we defined IUFD as delivery of a dead fetus weighing 1500 gm or more. The IUFD rate is the number of IUFD per 1000 deliveries. This study attempts to determine associated maternal and fetal risk factors to IUFD.

Methods. A case control retrospective study, in the Maternity and Children's Hospital, Jeddah, Kingdom of Saudi Arabia included all pregnant women admitted to the hospital with a diagnosis of singleton IUFD at the third trimester with a fetal weight of 1500 gm and more. Multiple pregnancy and intra-partum IUFD were excluded. The control group was all pregnant women admitted to the hospital with a singleton live birth before and after each case. A questionnaire was structured, completed by reviewing the patient, and the missing data obtained from the file of the patient. As a hospital policy, the neonatologist examines all IUFD. No autopsy was performed on any of the infants. The data were entered and analyzed using the Statistical Package for Social Sciences version 10. Continuous variables were summarized as means and standard deviation (SD), and categorical variables by frequency and percentage. Multiple logistic regression was used to assess the relation between IUFD and all risk factors.

Results. Total number of deliveries was 16562, with 157 cases of IUFD in that period, giving a rate of 10.1 per 1000 deliveries. In 28% of the cases, the associated risk factors could not be determined. The mean maternal age was 30.3 ± 6.5 for cases, and 28.4 ± 6.4 for control, which is not significant. **Table 1** shows the risk factors among cases and control with multiple logistic regression. Fetal trauma, hydrops, placental weight, fetal presentation and sex, color of the liquor, length of the cord and sepsis were found not significant among both group.

Discussion. The incidence of IUFD is variable among different centers.[3,5-9] Even locally, the incidence is variable in different regions of the country. Maternal conditions such as poorly controlled diabetes mellitus, hypertension either chronic or pre-eclampsia were more associated with poor outcome,[1,3,6,7,9,10] also in accordance with other studies.[3,5,6,9,10] These problems can be controlled to some extent if a good antenatal care service is provided. A past history of IUFD was more common in our cases. This may indicate some sub clinical genetic or chromosomal problems, which can recur in future pregnancies. The role of bad obstetric history was variable in the literature.[1,8,11] It was noticed to most affected women in their 3rd

Table 1 - Characteristic of the study group.

Risk factors	Number of patients (%)				*P*	IUFD	
	Cases		Control			OR	CI 95%
Diabetes mellitus	41	(26.1)	10	(3.2)	0.000	12.9	5.5-30.6
Hypertension	46	(29.3)	15	(4.8)	0.000	5.5	2.4-12.6
Abruptio-placenta	22	(14)	2	(0.6)	0.000	23.4	4.6-119.3
Un-booked	90	(57.3)	130	(41.4)	0.001	2.4	1.4-4
Cord accident	47	(56.6)	36	(43.4)	0.000	5.1	2.7-9.5
Congenital anomaly	9	(5.7)	0	0	0.000		
Parity							
(0-5)	121	(77.1)	268	(85.4)	0.08		
(6-10)	34	(21.7)	44	(14)			
(>10)	2	(1.3)	2	(0.6)			
Gestational age							
(27-31)	16	(10.2)	3	(1)	0.000		
(32-36)	41	(26.1)	22	(7.)			
(37-41)	92	(58.6)	275	(87.6)			
(>41)	8	(5.1)	14	(4.5)			
Intrauterine growth restriction	39	(24.8)	50	(16)	0.022		
Previous IUFD	13	(8.3)	6	(1.9)	0.001	7.01	2.1-23.6
Age							
(<20)	7	(4.5)	19	(6.1)	0.023		
(20-30)	81	(51.6)	202	(64.3)			
(31-40)	61	(38.9)	82	(26.1)			
(>40)	8	(5.1)	11	(3.5)			

OR - odd ratio, CI - confidence interval, IUFD - ante-partum intrauterine fetal death

decade, indicating that most of the affected cases are relatively young. However, this differs in comparison to the western community, where the problem was in elderly women.[6,11] This can be explained to some extent by better antenatal care services for which high-risk conditions were picked up and treated early. The effect of nulliparity was variable in different studies.[10] Our results showed risk to be higher in low parity women, compared to the Abha and Hofuf group, where grand multiparous women had a higher incidence of IUFD.[3,9]

The availability of antenatal care is the corner stone for identifying high-risk cases and therefore for providing specialized care, and eventually to reduce complications. Absence of antenatal care was more prevalent in IUFD cases, in accordance with other studies.[8,9] It was interesting to find that most of our IUFD cases have some associated problem, and only 28% were unexplained. This observation warrants detailed multi-center studies to look for a causative relationship, if any. In the literature, the incidence of unexplained IUFD is much higher, although autopsy is practiced in some centers.[1,4,5,8,12]

The difference in placental weight in cases and control was almost negligible. It may indicate absence of a co-relationship between function of placenta and its actual size. Congenital malformation is a known risk factor for IUFD and neonatal death. It is well documented that there are some defects, which cannot be detected by routine antenatal ultrasound, and are discovered at delivery.[12] The incidence of congenital anomaly was higher in the Abha and Hofuf group when compared to ours.[3,9] However, regression analysis did not support this finding in our work. Intra uterine growth retardation is a known associated complication for a number of congenital and chromosomal disorders. It was more prevalent in cases compared to control. A bias may have taken place because the gestational age given to IUFD cases is the date of delivery not the actual date of death.[6,8,12] In the Abha study, it was interesting to notice that most of the affected cases were of more than 2500 gm indicating that they were appropriate for gestational age.

Acute incidents such as abruption and cord accident were more common in IUFD cases. That would explain the loss of healthy fetuses in utero.[1] It was noticed that most of our fetuses were lost at 37 weeks and beyond. It may indicate that uterine conditions become hostile at that phase. It is recommended to apply closer surveillance at 37 weeks and beyond, so that fetuses will not be lost at that critical period.[7] The critical peak at which fetuses were lost is variable in the literature.[1,3,7,9,10,11,13] This may indicate the predisposing pathology for IUFD in our unit different compared to others.

In conclusion, the associated risk factors in our community seem to be preventable. We should pay attention to health education with emphasis on antenatal care and the benefit of regular attendance. Patient compliance is important in reducing most of these preventable fetal losses.

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