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Risk Factors Related to Intra Uterine Fetal Death at Tripoli Medical Center in 2011.

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ABSTRACT

Intra Uterine Fetal Death (IUFD) is a traumatic event for the family which occurs in about 1% of all pregnancies. In comparison with other countries this rate is increasing in Libya. Although obstetrical management has improved significantly, more than 50% of these cases are still unexplained. The aim of this study is to determine risk factors for IUFD. A standard questionnaire was designed and was filled by using medical records in 2011.

The sample included 385 records, including 85 cases (those who had IUFD) and 300 controls (those who had live newborn). Generally, gestational age and parity were found as major risk factors. Moreover, maternal risk factors included pregnancy complications, amniotic fluid problems, the history of IUFD, infertility treatment, recurrent miscarriage and malpresentation. Congenital abnormality was also found to be a major fetal risk factor, whilst third trimester bleeding was the risk factor related to placenta. Logistic regression analysis was employed to clarify further the role of confounding variables, risk factors related to mother, fetus and placenta in IUFD. It is difficult to identify preventable factors of IUFD. However, consultation, proper prenatal care, early diagnosis of complications and careful evaluation may reduce the incidence of IUFD. This study suggests that certain measures have to be taken by our health ministry to make women more aware of the risk factors involved in IUFD.

Conclusion: Several independent risk factors were identified, suggesting possible causes of death, which can be prevented by health education and antenatal care.

Keywords - *Intra uterine fetal death (IUFD); Risk factors.*

INTRODUCTION

Intra Uterine Fetal Death (IUFD) is an emotionally devastating event for both women and the medical staff involved. Whilst IUFD incidence is 0.5-1% of all pregnancies,[1] many studies show that progress in reducing these deaths has slowed in recent years.[2,3]

Counseling for obstetrical intervention is often based upon data regarding risk factors for intra uterine death, necessitating constant tracking of risk factor prevalence and significance. Couples wish to know the cause of the IUFD and its chances of recurrence, thus, the full investigation of possible etiological factors using a pragmatic approach will help in the postnatal counseling and management of future pregnancies.

Many studies have been conducted, identifying several factors associated with increased risk for IUFD: high parity, hydramnios, placental problems and meconium stained amniotic fluid.[3,4] Recent studies show that placental pathology plays a cardinal role in IUFD. Over 90% of IUFD, placenta examined and revealed some degree of placental vascular abnormalities, regarded of gestational age.[5]

Shifts in pregnancy management, follow up, and routine testing during recent years have changed the impact of several risk factors on IUFD cases. Unexplained IUFD cases have remained at a constant level throughout many years.[6]

The present study aimed to determine the risk factors for IUFD in a tertiary medical center.

MATERIAL AND METHODS

This was a case-control study conducted between 1st January 2011 and 31st December 2011 in the department of Obstetrics and Gynecology of the Tripoli Medical Center, Tripoli- Libya and included all pregnant women admitted to the hospital with a diagnosis of singleton IUFD at the third trimester (85 cases). The control group (300 cases) consisted of pregnant women admitted to the hospital with singleton live births. Multiple pregnancy and intra partum IUFD were excluded. A questionnaire was constructed and completed by reviewing the patients' files. The data were entered and analyzed using statistical methods. Multiple logistic regressions were used to assess the relation between IUTD and all risk factors.

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RESULTS

Descriptive data: overall 385 patients were analyzed in this study. Table 1 shows some of the main characteristics of the patients.

The mean value for age was not found to be significantly different between the two groups (P = 0.1). Regarding parity, there was a significant difference between two groups [P = 0.01] so the incidence of IUFD was higher in those with a number of pregnancies more than two in comparison with that of the primiparus (49.4% vs 40%). Regarding gestational age, there was also a significant difference between the two groups [P =0.000] and the majority of cases of IUFD were found to occur at a gestational age of more than 32 weeks.

The number of women in the case group who were suffering from chronic diseases such as hypertension or diabetes at the time of pregnancy and, or before, pregnancy was low. Therefore, a sum of all those complications was used for comparison between the two groups. As it is shown in table 2, hypertension was found to be significant (P = 0.000), whereas diabetes mellitus was not found to be significant (P = 0.1), although the number of subjects with diabetes in our data set was too narrow to draw any conclusions confidently.

There were positive correlations between the history of an amniotic fluid problem and IUFD (P = 0.001), history of IUFD and its repeated occurrence (P = 0.003), infertility treatment (P = 0.000), recurrent miscarriage (P = 0.000), malpresentation (P = 0.000), and trauma (P = 0.000).

From fetal risk factors, congenital abnormality was found to increase the risk of IUFD 15 fold. Overall 20 cases were found, 22.4% of which were in the case group and 3% in the control group. The most prevalent abnormality was neural tube defect. Regarding placental risk factor, third trimester hemorrhage included the hemorrhage from placenta previa and placenta abruption. 2.4% of IUFD cases had placenta previa whereas 30.6% had placenta abruption as compared to 3.3% of controls. Intra uterine growth restriction was found not to be significant (P = 0.12), both cases are equal.

Logistic regression analysis was employed for relevant variables (Table 3). It was concluded that variables such as gestational age (P = 0.000, B = 0.035), amniotic fluid problems (P = 0.000, B = 0.247), third trimester hemorrhage (P = 0.001, B = 0.664), malpresentation (P = 0.000, B = 0.373) and congenital abnormality (P = 0.000, B = 0.534) on their own, could be considered as a risk factor.

Other variables such as postdate, diabetes, maternal age, chorioamnionitis, meconium, macrosomia and growth restriction, which were found to be a risk factor in the simple models, were, in fact, under the influence of other factors and so cannot be considered as a risk factor on their own.

Table 1: Comparing descriptive characteristics of the subjects in the cases (n = 85) and control groups (n = 300)

Maternel age	Case	Control	*P.* value
< 20 yrs	1(1.2%)	6(2%)	
20–24yrs	10(11.8%)	52(17.3%)	
25–29 yrs	24(28.2%)	27.7(83%)	0.1
30–34 yrs	22(25.9%)	70(23.3%)	
35yr >	28 (32.9%)	89(29.7%)	
Parity	**Case**	**Control**	***P.* value**
P_1	34(40.0%)	80(26.7%)	
P_2–P_4	42(49.4%)	171(57.0%)	.01
P_5-P_8	9(10.6%)	49(16.3%)	
Gest age	**Case**	**Control**	***P.* value**
27–31wks	23(27.1%)	3(1%)	
32–36 wks	29(34%)	23(7.7%)	0.000
37–41wks	28(32.9%)	252(84%)	
>41wks	5(5.9%)	22(7.3%)	

Table2: Comparison between risk factors relating to mother, fetus, placenta in case (n =85) and control groups (n = 300)

Variables	Case number (%)	Control number (%)	*P*.value
Maternal Risk factors			
Pregnancy complication:			
Chronic hypertension	11(12.9%)	6(2%)	0.000
Pre – eclampsia	19(22.4%)	16(5.3%)	0.170
Diabetes mellitus	5(5.9%)	8(2.7%)	0.001
Polyhydramnous	7(8.2%)	3(1%)	0.000
Oligohydramenous	18(21.2%)	16(5.3%)	0.003
H/o Iufd	10(11.8%)	9(3%)	0.151
Me conium	7(8.2%)	12(4%)	0.221
Chorioamnionitis	1(1.2%)	0(0%)	0.000
Trauma	13(15%)	0(0%)	0.000
Infertility treatment	15(17.6%)	9(3%)	0.000
Recurrent miscarriage	36(42.4%)	62(20.7%)	0.059
Previous- cs	32(37.6%)	80(26.8%)	0.000
Mal presentation	22 (25.9%)	12(4%)	0.698
Postdate	1(1.2%)	9(3%)	0.000
No reason detected	20(23.5%)	4(1.3%)	
Fetal risk factors			
Congenital abnormality	19(22.4%)	1(3%)	0.000
Fetal weight (macrosomia)	10(11.8%)	33(11%)	0.846
Chromosomal abnormality	0(0%)	0(0%)	
Nuchal cord	0(0%)	0(0%)	
Rh- incompatibility	0(0%)	0(0%)	
Placental risk factors			
Intrauterine growth restriction	3(3.5%)	3(1%)	0.124
Placenta previa	2(2.4%)	0(0%)	0.048
Abruption placenta	26(30.6%)	10(3.3%)	0.000

Table 3: Logistic regression analysis of the relevant variables.

Variables	B	*P*. value
Maternal age	-0.003	0.350
Parity	0.016	0.123
Gestational Age	-0.035	0.000
Diabetes mellitus	0.055	0.501
Hypertension	-0.126	0.000
Polyhydramenous	0.078	0.436
Oligohydramenous	0.247	0.000
Intrauterine growth restriction	0.020	0.864
Macrosomia	-0.002	0.969
Congenital abnormality	0.534	0.000
Placenta previa	0.664	0.001
Abruption placenta	0.175	0.002
Postdate	0.028	0.755
Malpresentation	0.373	0.000

DISCUSSION

Fetal death has been defined by the world Health organization as deaths which occur at more than 24 completed weeks of gestation or with a birth weight >500 grams.[7]

Over the past several decades, the pattern of fetal death has changed. Some causes of fetal death, such as syphilis was no longer a significant problem, others, such as cord accidents, have remained relatively unchanged for decades and some such as anti-phospholipid antibodies have only recently been recognized. Several causes, such as chromosomal abnormalities, are not preventable even with modern medical knowledge, whereas others, such as post-maturity are completely preventable. Intra uterine fetal death is secondary to Rh isoimmunization toxemia and whilst diabetes has shown significant declines over the past three decades, many fetal losses continue to occur from intra uterine infections, lethal malformation, fetal growth restriction and abruption placenta.

It is still important to note that fetal death with no identifiable specific determinant is still the most common cause of fetal death throughout the past three decades.[8]

Risk factors for fetal death can be classified into general and specific categories. The general category includes socio-demographic data such as maternal age, parity and gestational age. The specific category includes maternal, fetal and placental factors. Contrary to the studies of Showghy[9], who stated that pregnancy at the age of 16 years and less can increase the IUFD risk factor by 4 times and the study of Frets and colleagues[10] showed pregnancy at the age of 35 or more can increase the risk of fetal death by 1.5 times. Our study did not show any significant difference between the two groups of case and controls ($P = 0.1$). Smith[11] suggested that maternal age is not solely the reason for IUFD, but major diseases, such as diabetes or high blood pressure, accompanied by the higher age can act as confounding variable.

The number of previous pregnancies in the current study was found to be a significant risk factor ($P = 0.01$) and the majority of IUFD cases were found to occur in women who had previous pregnancies.

It was noticed that most of our fetuses were lost at 37 weeks and beyond, where in our study the losses occur earlier. This may indicate that the uterine condition can become hostile at this stage, so it is recommended to apply closer surveillance at 32 weeks and beyond so that fetuses will not be lost at that critical period.

Regarding maternal factors, prenatal complications such as diabetes, hypertension and pre-eclampsia were prevalent in our data base (set) ($P = 0.000$), so the monitoring of blood pressure is suggested by authors [12] while diabetes mellitus, P value was 0.17, because the number of the subjects with diabetes in our data set was too narrow to draw any conclusion from it. However, many studies show diabetes mellitus can increase the fetal death. Guntan[13] emphasizes the importance of diabetes mellitus and suggests that proper pre-pregnancy consultation can decrease the probability of unsafe pregnancy. These problems can be controlled to some extent if good antenatal care services are provided.

A prospective study (Moyo 1996) has shown that infections such as *E-coli*, gram negative and gram positive bacteria, can increase the risk of IUFD more than 4 fold. However, there was only one case in our study who suffered from this problem.

As it is shown in our study, a past history of IUFD can also be a risk factor ($P = 0.003$), this may indicate some subclinical genetic or chromosomal problems which can recur in future pregnancies. Thus, performing electronic fetal monitoring as early as 32 weeks of gestation is recommended. Rabson reported this relation[14], however, Seppo did not report the repeated IUFD in his sample group.[15]

It was interesting to find that most of our IUFD cases have some associated problems, such as polyhydraminos, olighydraminos, infertility, recurrent miscarriage and post term and only 23.5% were unexplained. Therefore, the availability of antenatal care is the cornerstone for identifying high risk cases and for providing specialized care in order to eventually reduce complications.

Regarding placental factors, it was found that intra uterine growth restriction and post term delivery were not significantly correlated with IUFD ($P = 0.124$, $P = 0.698$). However, Divon found that a limited uterine growth rate can increase fetal death 10 fold at 41 weeks of gestation and, in addition, Canntigus[16] found that IUFD is associated with very low birth weight.

Hemorrhage during the third trimester was found to increase the risk of IUFD 6.4 times. Most of the IUFD cases were accompanied with placenta abruptio (30.6% in the case group versus 3.3% in the control group). Surkanp[17] also found a strong correlation between the IUFD and placenta previa and placenta abruptio ($P = 0.00$).

Regarding fetal risk factors, structural abnormality was found to be highly prevalent in the case group. Logistic regression analysis on the whole variables showed that some of the factors are confounding variable, which can be omitted and not be considered as major risk factors.

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. Investigating patients' complaints is important in reducing most of these preventable fetal losses.

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