

THE CLINICAL PREDICTORS OF INTRAUTERINE FETAL DEATH*

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SUMMARY: Önderoğlu L, Tuncer ZS. (Department of Obstetrics and Gynecology, Hacettepe University Faculty of Medicine, Ankara, Turkey). The clinical predictors of intrauterine fetal death. Turk J Pediatr 1998; 40: 543-547.

Five hundred and thirteen (513) patients with intrauterine fetal death managed between 1983 and 1990 at Hacettepe University Hospital were analyzed retrospectively. Fetal death rate was 20.5/1,000 deliveries during the study period. The mean age of the mothers at diagnosis was 27.6 years. Of the 326 multigravida patients, 113 (34.6%) had a history of abortion and 113 had a history of previous intrauterine fetal death. The leading causes of intrauterine fetal death in this series were maternal hypertension in 167 patients (32.5%) followed by abruptio placentae in 38, Rh incompatibility in 30 and congenital anomalies in 30 patients. However, in 175 patients (34.1%), the cause of intrauterine fetal death could not be explained. Three mothers were lost: one from pulmonary embolism complicating deep venous thrombosis, one from heart failure due to rheumatic disease, and one from cerebral injury following a traffic accident. The patients with a history of fetal demise should be managed under high risk category with close antepartum surveillance, especially in the last trimester, so as to reduce intrauterine fetal deaths which are mostly attributable to preventable causes. *Key words:* intrauterine fetal death.

Intrauterine fetal death is one of the most challenging complications of pregnancy. Identification of the specific cause giving way to stillbirth is essential in order to assess the risk in future pregnancies as well as to develop preventive measures for reduction in mortality. Although autopsy studies were thought to be essential, in most of the cases clinical investigation could identify a cause for stillbirth^{1,2}.

The aim of the present study is to assess the clinical factors that may play a role in the etiology of intrauterine fetal death.

Material and Methods

Five hundred and thirteen (513) patients with intrauterine fetal death managed between 1983 and 1990 at Hacettepe University Hospital served as the subjects of this report. Cases with a birth weight less than 500 g were excluded from the study. The associated factors for intrauterine fetal death were classified after reviewing the antenatal records. Autopsy could be carried out in only 50 (9.6%) patients due to religious reasons. During the study period, 25,321 deliveries were performed at the institution.

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The maternal and fetal conditions which may be relevant in the etiology of intrauterine fetal death were classified as follows: 1) maternal hypertension, which was further classified as preeclampsia, chronic hypertension, superimposed preeclampsia and eclampsia, 2) abruptio placentae (without maternal hypertension), 3) maternal insulin-dependent diabetes mellitus, 4) Rh isoimmunization, 5) fetal anomaly, 6) congenital infections, 7) cord accidents or compression when two or more nuchal cords, true knots, prolapse or thrombosis of the cord were present, 8) chorioamnionitis, confirmed by histological examination of the membranes and the placenta, 9) intrauterine growth retardation, 10) unexplained death, and 11) miscellaneous reasons.

There were 491 singleton, 17 twin and one quadruplet pregnancies. There were single intrauterine fetal deaths in six of the twins and one in the quadruplet pregnancy. The study group, thus, included 513 patients with 520 stillborn infants. Only 84 (16.3%) of the patients followed regular antenatal visits from the first trimester. The weights of the stillborn infants were recorded as 500-999 g in 115 (22.1%), 1000-1499 g in 169 (32.5%), 1500-2499 g in 128 (24.6%), and 2500-4000 g in 108 (20.8%) infants.

Results

Fetal death rate was 20.5/1,000 deliveries during the study period. The mean age of the mothers at diagnosis was 27.6 years (range 17-46). The mean values of gravidity and parity were 3.06 (range 1-15) and 1.5 (range 0-12), respectively. Of the 326 multigravida patients, 113 (34.6%) had a history of abortion and 113 had a history of previous intrauterine fetal death. In 33 of them, a history of both intrauterine fetal death and spontaneous abortion were present (Table I).

The associated factors and probable causes of death in 513 cases are shown in Table II. The leading causes of intrauterine fetal death in this series were maternal hypertension in 167 patient (32.5%) followed by abruptio placentae in 38, Rh incompatibility in 30 and congenital anomalies in 30 patients (Table II). However, in 175 patients (34.1%), the cause of intrauterine fetal death could not be explained.

The congenital anomalies detected in 30 (5.7%) stillborn infants were meningocele (6), anencephaly (6), multiple fetal anomalies (5), bilateral renal agenesis (4), hydrocephalus (4), gastrochisis and bilateral hydronephrosis (2), bone and cartilage maturation defect (1), chest wall defects (1), and congenital heart disease with hydrops fetalis (1). In the intrauterine infection group there were two cases with toxoplasmosis, two with rubella and five with cytomegalovirus (CMV) infection.

Table I: Clinical Characteristics of the Patients

Characteristics	No	%
Age (yrs)		
≤19	22	4.4
20-34	460	89.6
≥35	31	6.0
Gravida		
1	187	36.5
2-4	213	41.5
>5	113	22.0
Para		
0	187	36.5
1	116	22.6
2-4	139	27.1
≥5	71	13.8
History of abortion		
Total	113	34.6
1	99	87.6
2	12	10.6
≥3	2	1.8
Previous fetal demise		
Total	113	34.6
1	61	54.0
2	29	25.6
≥3	23	20.4

Table II: Causes of Intrauterine Exitus vs Gestational Age.

Cause	Gestational age (weeks)					Total
	20-27	28-31	32-36	37-41	≥42	
Preeclampsia	19	23	29	28	—	99
Chronic hypertension	4	11	8	—	—	23
Superimposed preeclampsia	—	7	10	2	—	19
Eclampsia	7	4	12	3	—	26
Abruptio placentae	9	5	19	5	—	38
Diabetes mellitus	—	5	2	5	—	12
Rh isoimmunization	7	8	9	6	—	30
Fetal infection	2	4	2	1	—	9
Cord accidents	1	1	3	13	2	20
Amniotic infection	3	2	—	—	—	5
Placental insufficiency	—	2	2	—	—	4
Miscellaneous	5	7	7	2	2	23
Unexplained	22	40	60	50	3	175
Congenital anomalies	8	13	2	7	—	30
Total	87	132	165	122	7	513

The mode of delivery in the stillborn infants was by vaginal route in 425 cases (81.7%), primary hysterotomy in 70 cases (13.5%) and repeat hysterotomy in 25 (4.8%) cases. Of the 520 stillborn infants, 135 were macerated. Maceration was present in 102 infants with less than 37 completed weeks and in 33 full-term infants. Among the unexplained death group of 175 stillborn infants, 91 were pre-term and 85 were macerated.

Three mothers were lost due to 1) pulmonary embolism complicating deep venous thrombosis, 2) heart failure due to rheumatic disease and 3) cerebral injury following a traffic accident.

Discussion

This study draws attention to the major contributing factors and probable causes of intrauterine fetal death in a single institution. The intrauterine fetal death rate was 20.5/1,000 deliveries in this series. The corresponding rate reported from the United States is 10/1,000 births¹. It was 3.8/1,000 in an Oxford study³. Recently, stillbirth was reported to range between 5-12 deliveries in 1000 births by Schauer et al.⁴ and Fretts et al.⁵. The relatively higher rate observed in the present report may be attributed largely to the high number of late high-risk pregnancy referrals from other institutions as well as to insufficient peripartum care in the institution and throughout the country.

The observation of a higher mean age (27.6) and mean gravidity (3.06) is consistent with previous observations that the stillbirth rate doubles with advancing maternal age and that perinatal mortality increases with increasing parity⁶⁻⁸.

When the 326 multigravida patients' obstetric histories are considered, 34.6 percent of the patients had a history of at least one intrauterine fetal death. Several studies also suggested that a previous stillbirth history is among the most significant of all historic risk factors⁹⁻¹¹.

The most frequent associated factors of stillbirth categories were the unexplained and the maternal hypertension groups. There was no obvious cause of the fetal death in 175 of the cases. Yudkin et al.³ also identified unexplained deaths in a significant proportion of cases. They reported that the unexplained stillbirths made up 43 percent of all stillbirths and that risk of an impending unexplained stillbirth at 41 weeks' gestation was four times that at 33 weeks'; before 33 weeks' gestation the risk was very small. One hundred and sixty-seven of the intrauterine fetal deaths were associated with hypertensive disease and 92 of them occurred at 32 weeks or more of gestation. Two hundred and ninety-two (56.9%) of the fetal deaths occurred after the 32nd week, at a time when fetal viability is reached. Thus, a close follow-up may obviate some of the fetal deaths.

Major anomalies account for seven to 21 percent of stillborn fetuses⁴. This figure was 5.7 percent in this series. Since major anomalies are reported to occur in approximately two to three percent of all births in the general population, the contribution of congenital anomalies to this series is worth emphasizing¹²⁻¹⁴.

In most series, it was advocated that autopsies and histological studies should be performed on all stillbirth infants and placentas to identify the cause^{1,15}. On the other hand, useful information could also be obtained by careful evaluation of the risk factors and by clinical examination of stillborn infants because, as seen in this study, autopsies cannot always be performed^{16,17}.

In conclusion, patients with a history of fetal demise should be managed under high risk category with close antepartum surveillance, especially in the last trimester, so as to reduce intrauterine fetal deaths which are mostly attributable to preventable causes.

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