The Rate And Associated Features Of Stillbirth Among Eclamptic And Preeclamptic Women*

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SUMMARY

THE RATE AND ASSOCIATED FEATURES OF STILLBIRTH AMONG ECLAMPTIC AND PREECLAMPTIC WOMEN

Objective: This study was performed to determine the rate of stillbirth among hypertensive pregnant women and to document the relation between stillbirth and various demographic, obstetric and laboratory parameters.

Methods: Forty-three hypertensive women were enrolled the study. Stillbirth was defined as those infants born at 20 weeks gestation or later whose Apgar score was 0 at 1 and 5 minutes.

Results: The rate of stillbirth was 18.6% among eclamptic and preeclamptic women. Gestational age was found significantly small in stillbirth group than live birth group (32.6±5.7 versus 36.9±3.3, p<0.05). The majority of stillbirth was identified at the eclamptic women (62.5%, p<0.05) and hellp syndrome was associated to the clinic course in the half of the stillbirth cases. The stillbirth group had significantly higher mean values of conjugated fraction of bilirubin and total bilirubin (p<0.01). There was only one case of intrapartum stillbirth among the 8 cases. None of the women had antenatal care in the stillbirth group.

Conclusions: Eclamptic women especially complicated by Hellp syndrome had had a greater risk of stillbirth when compared to preeclamptic women. The majority of stillbirth had occurred before admission to hospital. Sufficient antenatal care seemed that the most important factor to decrease the rate of stillbirth.

Key words: Stillbirth, Eclampsia, Hellp syndrome, Antenatal care

ÖZET

PREEKLAMPTİK VE EKLMAPTİK GEBELERDE ÖLÜDOĞUM SIKLIĞI VE EŞLİK EDEN FAKTÖRLER

Amaç: Hipertansif gebelerde ölü doğum sıklığını saptamak ve ölü doğum ile çeşitli demografik, obstetrik ve laboratuvar parametreler arasındaki ilişkiyi incelemek.

Metod: Çalışmaya 43 hipertansif gebe dahil edildi. Yirmi hafta ve üzerindeki doğumlarda birinci ve beşinci dakika Apgar skorunun sıfır olması ölüdoğum olarak tanımlandı.

Bulgular: Preeklamptik ve eklamptik gebelerde ölüdoğum sıklığı %18.6 saptandı. Gebelik yaşı ölü doğum grubunda canlı doğum yapanlardan anlamlı olarak kısa bulundu (32.6±5.7 ve 36.9±3.3, p<0.05). Ölüdoğumların önemli bir kısmı eklamptik gebelerde saptanmış (%62.5, p<0.05) olup olguların yarısında klinik tabloya Hellp sendromu eşlik ediyordu. Ortalama serum direkt ve indirekt bilirubin düzeyleri ölüdoğum grubunda anlamlı olarak yüksek bulundu (p<0.01). Toplam 8 ölüdoğumdan sadece bir olgu intrapartum döneme ait olup bu gruptaki olguların hiçbirisinde antenatal takibin olmadığı gözlendi.

Sonuç: Ölüdoğum riski özellikle Hellp sendromu ile komplike eklamptik gebelerde yüksektir. İntrauterin ölümlerin büyük bir kısmı hastaneye başvurmadan önce olup ölüdoğum sıklığının azaltılmasında yeterli antenatal takip önemli bir faktör olarak görünmektedir.

Anahtar Kelimeler: Ölüdoğum, Eklampsi, Hellp sendromu, Antenatal takip

Pregnancy-induced hypertension (PIH), an important cause for fetal death as well as maternal morbidity and mortality (1). Most of the studies in this field are about clinical management. There are few studies on fetal outcome and most of these related to perinatal mortality consist of stillbirths and neonatal deaths. It is reported that the most important risk factors for stillbirth in PIH are midtrimester pregnancies and abruptio placenta and the rate 2-10% (2-4). Taking into account the different causal factors for stillbirth and neonatal death we aimed at examining only the characteristics of stillbirth in PIH.

METHODS

This study was carried out at the Department of Gynecology and Obstetrics in Medical school in Yüzüncü Yıl University. Forty-three PIH cases treated and delivered between 1 January 1995 and 31 March 1996 were included in the study. Of total cases, 8 stillbirths

Table 1. The distribution of pregnancy-induced hypertension types.

	Stillbirths		Live births		P
	No	%	No	%	
All cases					<0.05
Mild preeclampsia	0	-	11	31.4	
Severe preeclampsia	3	37.5	16	45.7	
Eclampsia	5	62.5	8	22.9	
In cases except complicated by Hellp syndrome					>0.05
Mild preeclampsia	0	-	10	33.3	
Severe preeclampsia	2	50.0	15	50.0	
Eclampsia	2	50.0	5	16.7	

Table 2. The distribution of Hellp syndromes among PIH types.

Hellp syndrome	Types of PIH					
	Mild preeclampsia		Severe preeclampsia		Eclampsia	
	No.	%	No.	%	No.	%
Present	1	9.1	2	10.5	6	46.2
Absent	10	90.9	17	89.5	7	53.8

p<0.05

and 35 live births consisted of study group and control group, respectively. Data regarding to type of PIH, sociodemographic, clinical, obstetric characteristics, and laboratory findings were collected as prospectively. We defined fetal death as any birth at 20 weeks' gestation or greater with an Apgar score of 0 at 1 and 5 minutes. If the blood pressure was higher than 160/110 mmHg the PIH was classified as severe, otherwise as mild accompanied by either generalized edema or proteinuria (of at least 2 or more) on dipstick examination. Unemployment and those who have no social security were accepted as poor socioeconomic status. Antenatal care criterion was at least 1 visit in each trimester. An infant was considered as small-for gestational age (SGA) if the birth-weight was below the tenth percentile according to gestational weeks (5). Hemolysis, elevated liver enzymes and low platelets (<100.000/mm3) were the criteria for Hellp syndrome. If the value of BUN and/or serum creatinine was twice higher than the normal, it was defined as "impaired renal function".

In our department, aggressive management is practiced for eclampsia and Hellp syndrome, labor induction was started as soon as the condition of woman gets stabile, regardless of taking account the gestation weeks. Expectant management is practiced in mild preeclampsia whereas aggressive approach is preferred in severe preeclampsia, above 32 weeks' gestation.

Statistical analyses, namely chi-square, student t test, Fisher's exact test and Mann Whitney-U test, were performed using SPSS for Windows packet program. The numeric parameters with unequal variance ($p<0.05$ on Levene test) such as BUN, ALT, AST, serum creatinine and bilirubin levels were analyzed using Mann Whitney-U test A p value <0.05 was significant.

RESULTS

During the study period, 228 deliveries and 22 stillbirths were observed. In all cases, stillbirth rate was 9.6%. Of 43 PIH cases, 8 were stillbirth and 35 live birth. Stillbirth rate was 18.6% in PIH cases. PIH-dependent stillbirth rate in the total stillbirths was 36.4%. The rate of PIH cases in the total deliveries was 18.9%.

The distribution of PIH types in all cases was given in first section of Table 1. While eclampsia was at high level (62.5%, $p<0.05$) in stillbirth group, mild preeclampsia was not observed. The distribution of PIH types excluding Hellp syndrome cases was given in the second section of Table 1. With respect to PIH types, the significant difference was lost among the groups ($p>0.05$). Hellp syndrome which observed as approximately 10% in both mild and severe preeclampsia consist of almost half of eclampsia cases ($p<0.05$, Table 2).

The evaluation of the various demographical and clinical characteristics was presented in Table 3- While mean gestational age at delivery was small in stillbirths than controls; maternal age, parity, blood pressure at admission and fetal birth weight were similar between two groups.

While in regard of socioeconomic status, antenatal care, antihypertensive treatment after the admission, generalized edema, proteinuria, impaired renal function, low-birth-weight, SGA, fetal sex and mode of delivery were similar, Hellp syndrome and prematurity were higher in stillbirths than live births (50% versus 14.3% and 25% versus 2.9%, respectively) ($p<0.05$, Table 4).

Laboratory findings were given in Table 5. Although, average serum creatinine, ALT, AST, and BUN values were higher and mean platelet number was lower in stillbirth group, the difference was not significant ($p>0.05$). On the other hand, mean values of unconjugated and conjugated bilirubin in stillbirth group were higher ($p<0.01$) than control group (2.5±2.6 versus 0.6+0.3, and 0.8±0.6 versus 0.3±0.1, respectively).

Chronic hypertensive case or major fetal anomaly were not observed. However, only in one case abruptio placenta was determined and this case was in live birth group.

DISCUSSION

In this study, stillbirth rate was found very high (9.6%) for all deliveries. Of 22 stillbirth 8 (36.4%) was PIH-related which was four times higher than (9%) re-

Table 3. The distribution of various demographic and clinical characteristics between stillbirths and live births in PIH cases.

	Stillbirths	Live births	P
	mean±SD	mean±SD	
Age	30.0±8.8	28.2±7.8	NS
Parity	5.0±4.2	3.8±3.3	NS
Systolic blood perssure at admission (mmHg)	155.0±7.6	154.6±14.0	NS
Gestational age at delivery (wk)	32.6±5.7	36.9±3.3	<0.05
Birth weight (gr)	2612±1330	2581±684	NS

ported by Ahlineus et all (6). Similarly, stillbirth rate in PIH cases was higher than pervious reports (2-4). PIH-related stillbirth rate in severe preeclampsia-eclampsia was reported as 9% excluding one major fetal anomaly (1). In our study, stillbirth rate for severe preeclampsia-eclampsia cases was 33-3% when excluded mild PIH cases, both overall and PIH-related high stillbirth rates could be explained by being our hospital as a reference center. In addition, low socioeconomic level and poor antenatal care may also be reason finding high stillbirth rates. Of 43 PIH cases only 5 (11.6%) had antenatal care which was significantly lower than the figure (82%) which reported by Sibai et al. (2). In the most of cases (87.5%), the fetal death was occurred before admission. This indicates the importance of antenatal care. Finding poor antenatal care can not be explained by only lower socioeconomic level, because even one-fourth of women had lower socioeconomic level, almost none of them had antenatal care. Maybe the main problems for that are illiteracy and self-careless of woman.

There is a linear correlation between severity of PIH and fetal loss, high stillbirth rate was especially reported in Hellp syndrome and eclampsia cases (7-11). Similar to this we found that, sitllbirth rate was significantly higher in eclampsia than preeclampsia whereas no stillbirth was observed in mild preeclampsia (62.5% versus 37.5%, $p<0.05$, Table 1). On the other hand there is no significant difference among the PIH types for stillbirth when Hellp syndrome cases were excluded ($p>0.05$). In addition there was a linear correlation between associated Hellp syndrome and PIH types (table 2). Of 11 mild preeclampsia cases only in one, and of 13 eclampsia cases 6 Hellp syndrome was determined ($p<0.05$). Because of this findings we suggest that other than severity of PIH, associated Hellp syndrome may be main causative factor for stillbirth.

It was reported that stillbirth rate was 10% in hellp syndrome cases (4). In our study, this rate was found as 44.5% (table 4). The cause of high stillbirth rate in Hellp syndrome may be related to serious uteroplacental insufficiency, and impaired hepatic and renal function. In this study, both conjugated and unconjugated bilirubin levels in stillbirth group were observed high ($p<0.01$, Table 5). This finding is indicator of hemolysis and hepatocellular damage and shows the reason-result relation between Hellp syndrome and stillbirth. In addition, BUN, ALTS, AST, and serum creatinine values were also high in stillbirths group. Because of, probably, high standard deviation due to heterogeneous distribution of values, differences among the groups were not significant statistically.

Hypertension is not effective on fetal survival alone, associated severe proteinuria is also important for increased fetal loss (8,12). However, proteinuria may not be the only determinant factor for stillbirth according to Lin et al. (13). They performed postpartum renal biopsy in 157 hypertensive cases and higher stillbirth rate was found in multiparous severe preeclampsia group compared to chronic glomerulonephritis group, although there was the same degree proteinuria in both groups. We also did not find any significant difference between two groups according to proteinuria ($p>0.05$, Table 4).

Gestational age is the most important indicator of fetal survival in PIH. Fetal survival is the best above 36 weeks' gestation and the worst below 28 weeks (1,10,14). The primary reason for this situation is immaturity of fetal lung. In addition, the earlier starts the PIH the higher probalitiy of intrauterine growth retardation, which decreases the fetal survival (1). We found that gestational age at delivery was four weeks shorter in stillbirth group ($p<0.05$, Table 3). Even mild preeclampsia cases practiced expectant management were excluded, there was still a three-week shortness between two groups. For this reason it could be said that the earlier starts the PIH the higher stillbirth rate.

Abruptio placenta and SGA are considered the major reasons for stillbirth in PIH (1,15). But we did not find significant differences between two groups for both conditions.

Table 4. The distribution of various sociodemographic, obstetric and clinical characteristics between stillbirths and live births.

	Stillbirth		Live births		P
	No.	%	No.	%	
Poor socioeconomic status	2	25	10	28.6	NS
antenatal care	0	-	5	14.3	NS
SGA	1	12.5	6	17.1	NS
Low-birth weight (<2500 gr)	3	37.5	13	37.1	NS
Prematurity (<37 wk)	2	25	1	2.9	<0.05
Use of antihypertensive agents	6	75	16	45.7	NS
Proteinuria	5	62.5	26	74.3	NS
Generalized edema	6	75	16	45.7	NS
Hellp syndrome	4	50	5	14.3	<0.05
Impaired renal function	2	25	5	14.3	NS
abdominal delivery	2	25	12	34.3	NS
Fetal sex (male)	4	50	17	48.6	NS

NS: Non significant

Table 5. Laboratory findings.

	Stillbirths	Live births	P
	mean±SD	mean±SD	
Uric acid (mg/dl)	6.9±1.5	6.9±2.0	NS
Serum creatinine (mg/dl)	2.1±2.0	1.2±1.1	NS
BUN (mg/dl)	43.1±41.3	23.6±15.1	NS
Hemoglobin (gr/dl)	12.6±1.0	12.8±2.6	NS
Hematocrite (%)	38.3±4.1	38.2±8.1	NS
ALT (IU/L)	233±314	48±51	NS
AST (IU/L)	201±248	54±82	NS
Unconjugated bilirubin (mg/dl)	2.5±2.6	0.6±0.3	<0.01
Conjugated bilirubin (mg/dl)	0.8±0.6	0.3±0.1	<0.01
Platelets (x103/mm3)	135±89	212±109	NS

As a summary, the major causative factors for stillbirth in PIH in our population were severity of PIH (especially complicated by Hellp syndrome) and earlier weeks' gestation. So, in PIH cases special care attention should be given for liver and renal function screening tests. In order to get better fetal survival in PIH, prenatal care should be improved. In addition, early hospitalization, close follow-up with fetal surveillance tests, and appropriate magnesium sulfate treatment are well known important issues for prevention of fetal loss.

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