

## **Retrospective assessment of 173 patients diagnosed with preeclampsia (including eclampsia): A study of 6 years**

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### **Abstract**

**Preeclampsia is a multisystemic, multiphasic, multitheoretical and preventable disorder deteriorating both mother and child's health. One hundred seventy three preeclampsia (including eclampsia) cases admitted to our clinic evaluated retrospectively between 1996 and 2002, in Izmir, Turkey, which is a socioeconomically challenged country. 66.5% of patients were primiparas. Mean gestational week was  $35.8 \pm 4.75$ . According to the gestational week, 60.1% were preterm (<38<sup>th</sup> week), 37.6% term (38-40<sup>th</sup> week) and 2.3% postmature (>40<sup>th</sup> week). Mean arterial pressure levels were  $126 \pm 4.9$  mmHg before treatment and  $98.2 \pm 11.7$  mmHg after treatment. An associated edema was found in 85.5% and proteinuria in 80.4% of patients. After treatment, 60.1% of patients had recovered. Caesarean section delivery incidence was 37.6%. Early diagnosis of preeclampsia is essential for the diminution of perinatal mortality, especially where dominate poor socioeconomic conditions exist.**

**Keywords:** Preeclampsia, hypertension, poor socioeconomic

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### **Introduction**

Preeclampsia (including eclampsia) is multisystemic, multiphasic, and multitheoretical, with an unknown origin, and can develop due to inadequate follow-up during pregnancy more frequently in areas with a low socioeconomic status [1].

Preeclampsia could be defined as a progressive hypertension (>140/90 mmHg) occurring after the 20<sup>th</sup> week of gestation, most frequently in the last 6 weeks. It occurs in 14-20% of the primigravidas, in 5.7-7.3% of multigravidas and in 25% of chronic hypertensives. It could be responsible for 15% of all maternal mortality during pregnancy [2]. The course of hypertension caused by pregnancy could vary from pure hypertension to preeclampsia, eclampsia, and HELLP (Hypertension, Elevated Liver Enzymes, Low Platelets) Syndrome [2]. Hypertension due to pregnancy is the most common cause of maternal and perinatal mortality and morbidity all over the world [3,4]. This situation requires early diagnosis, an appropriate approach, and urgent treatment. These pregnant women must be monitored carefully and intensively. When the fetus reaches a state in which s/he may not survive, delivery must be performed. In our study, the importance of early diagnosis of preeclampsia, determination of risk factors, training of the patient, careful and

regular antenatal evaluation, and appropriate treatment for prevention and conservation of the mother and the child are emphasized.

### **Material and Methods**

In this study, the demographic values, obstetrical histories, laboratory findings and clinical evaluations of 173 patients hospitalized and treated for a diagnosis of preeclampsia (including eclampsia) between September 1996 and May 2002 in Atatürk Research and Training Hospital in Izmir were evaluated retrospectively. Concerning the rearrangement of antihypertensive therapy, the use of  $\alpha$ -methyl-dopa as the primary step of treatment is thought convenient to patients who had severe preeclampsia, with unresponsiveness to diet and rest therapy. During MgSO<sub>4</sub> therapy, deep tendon reflexes and hourly urinary output were observed carefully. All patients' information was obtained from protocol registers and patients' files. Demographic obstetrical histories, laboratory findings and clinical parameters of all patients were entered in tables in Microsoft Office Excel Pocket Program format. The statistical significance of mean average and percentages of all enrolled patients was evaluated. Chi-square and variance analysis were performed using SPSS v9.0 Pocket Program.  $P < 0.05$  is defined as statistically significant.

**Results/Observations**

The frequencies of seasonal distribution of submission to hospital were: 50 patients (28.9%) in spring, 45 (26%) in winter, 43 (24.9%) in autumn, 35 (20.2%) in summer. Mean treatment duration of patients was  $5.2 \pm 1.7$  days. Mean age was  $27 \pm 5.4$  years. 91 patients (52.6%) lived in rural area. 115 patients were primiparas (66.4%). Mean gestational week was  $35 \pm 7.5$ . According to gestational week, 104 patients (60.1%) were preterm, 65 term (37.6%), and 4 postmature (2.3%) (Table 1). 8 patients (4.6%) had previous preeclampsia (including eclampsia) history. Mean arterial pressure was 126.49 mmHg before treatment. It was found to be 98.21 mmHg after treatment. Edema was present in 148 patients (85.5%) and proteinuria in 142 (80.4%). According to laboratory values of pregnant women at submission, in 105 patients (60.7%) WBC, in 153 (88.4%) ALP, and in 95 (54.9%) LDH values were elevated. In 107 cases  $Na^+$  (61.8%), and in 72 (41.6%)  $Ca^{++}$  values were below normal. Following therapy, 168 patients (97.1%) had recovered. Caeserean section delivery incidence was found to be 37.6% (65 patients). In our clinic, abdominal section caesarean is the preferred operation in the case of preeclampsia.

**Table 1. Case Distribution According to Maturity (Gestational Week). (Premature: <38<sup>th</sup> week, term (38-40<sup>th</sup> week) and postmature (>40<sup>th</sup> week))**

Cases	n	Ratio (%)
Premature	104	60.1
Term	65	37.6
Postmature	4	2.3
Total	173	100.0

**Table 2. Relationship between blood platelet number during the hospitalization time and prognosis ( $\chi^2$ : 12.313,  $p < 0.05$ ). (Low: platelets < 140000 K/ $\mu$ L, normal: platelets 140000 – 440000 K/ $\mu$ L, high: platelets > 440000 K/ $\mu$ L)**

		Prognosis		n
		Exitus	Recovery	
<b>Blood Platelet Number</b>	Low	4	44	48
	Normal	1	121	122
	High	0	3	3
Total		5	168	173

**Table 3. Relationship between Gestational Week (Maturity) and Fetal Distress ( $\chi^2$ : 24.037,  $p < 0.05$ ). (Premature (<38<sup>th</sup> week), term (38-40<sup>th</sup> week) and postmature (>40<sup>th</sup> week))**

		Fetal Distress	
		Present	Absent
Gestational Week	Premature	71	33
	Term	30	35
	Postmature	3	1
Total		104	69

**Table 4. Case Distribution According to Parity.**

	Number of patients	Ratio (%)
Primipara	115	66.5
Multigravida	58	33.5
Total	173	100.0

A significant relation was found between platelet count at submission and a good prognosis ( $p < 0.05$ ). If the number of platelets were reduced, the prognosis was worse. Similarly, a relationship was found between platelet count at submission and incoming patient's status ( $p < 0.05$ ). As the platelet count was lower, the probability of severe preeclampsia (including eclampsia) increased (Table 2) ( $\chi^2$ : 12.313,  $p < 0.05$ ). As the gestational week progressed, the probability of fetal distress was increased (Table 3) ( $\chi^2$ : 24.037,  $p < 0.05$ ). The incidence of primiparity was significantly greater than (66.5%, 115 patients) multigravidity (33.5%, 58 patients) in patients with preeclampsia (including eclampsia) (Table 4). The dwellings of 91 patients (53.9%) were rural (midtown, village, peripherals of towns and midtowns). 82 patients (46.1%) had urban localizations (town, district). Mean gestational week was  $35 \pm 4.75$ .

Hypertensive retinopathy was encountered in 11.6% (20 patients) of cases. Retinopathy was found in 20 out of 23 (86.9%) severe preeclamptic cases. Total blood protein level and albumin levels were properly related to edema. In 51.5% of cases (69 patients), baby's weight was found under normal ranges. In 47% of patients (63 patients), birth weight was within normal range. In our study a significant relation was established between WBC and

preeclampsia-eclampsia occurrence probability at hospitalization ( $p < 0.05$ ).

In addition, a relationship was established between reduction of platelets and worsening of prognosis ( $p < 0.05$ ). The incidence of preeclampsia was found to be 3.8% in December in our trial. Preeclampsia was diminished in spring and summer (in August 2.46%). In our study, incidence in February was 11.6% (20 patients) and 5.2% in August.

## Discussion

The incidence of hypertension induced by pregnancy is very high [2]. If the conceptional age is advanced, the incidence of chronic hypertension and superimposed preeclampsia-eclampsia is increased. When pregnancies over the age of 35 years old and under age of 20 years old were compared, the risk significantly increases for over-35 year olds [3]. Our findings were similar regarding age of parity. In the literature, the notion that in some regions the illness is found much more frequently among poor women is often derided [3].

Preeclampsia (including eclampsia) generally occurred in the 3<sup>rd</sup> trimester, especially between 30<sup>th</sup> and 36<sup>th</sup> week of gestation. In the literature, it is described that accompanying renal and hypertensive diseases are usually seen with preeclampsia, which worsen the prognosis [5,6,7]. This finding is notified as arteriolar vasospasm in 80% of cases [2,8]. It is also described that retinal edema is rare and hemorrhage and exudation are less than 2%. According to the literature, arteriolar vasoconstriction is properly related to the severity of the syndrome [2,3,9]. Our findings support this claim. With decreased total blood protein and albumin levels, the incidence and severity of edema increases [6]. Proteinuria is the major sign of preeclampsia as described in literature [5,6]. In preeclamptic patients with proteinuria, the risk of premature delivery and perinatal mortality is significantly increased [7,10]. Waugh et al, described that there is a significant relation between mean arterial pressure and neonatal weight [11]. With increased levels of hypertension, the probability of low birth weight increases. However, we could not find any statistically supportive findings about this fact. Nevertheless, in the literature, perinatal mortality and mean blood pressure were found to be closely related [1]. As the mean blood pressure increases, the perinatal mortality increases.

Despite various therapies ( $\alpha$ -methyl-dopa,  $MgSO_4$  e.g.), the patients in whom blood pressure couldn't be controlled, especially those with a blood pressure greater than 110 mmHg, with liver enzymes levels elevated, with thrombocytopenia and pulmonary edema beginning to develop, proceeding to HELLP Syndrome, or deepening

of fetal hypoxia occurring, must immediately be delivered. In mild cases,  $MgSO_4$  therapy was not the first choice of therapy. In eclampsia and severe preeclampsia,  $MgSO_4$  was the first and only choice of therapy. There was a significant correlation between our clinic's protocol and that of the literature. Superiorities of  $MgSO_4$  therapy are described in the studies of Sibai et al. [4], Monico et al. [9] and Graham [12].

In addition, the literature supports our finding by describing preeclampsia as being a high inflammatory response of the mother against pregnancy [13]. The literature also describes that thrombocytopenia and increasing of thrombocyte volume are the most valuable criteria for designation of severity of preeclampsia [14,15]. In their study of 1869388 patients in Norway between 1967 and 1988, Per Magnus & Anne Eskild (2001), reported that they encountered preeclampsia in 2.7% (51801 patients) [16].

Similar studies performed in other countries describe that preeclampsia has a systematically seasonal variation [16]. They indicate that preeclampsia can occur frequently in winter and rarely in summer. Similarly, in the literature, incidence of preeclampsia in autumn and in winter was 50.9% and in spring and in summer 9.1%. Accordingly, we get the hypothesis that the probability of preeclampsia is higher in a cold climate, increasing the vasoconstriction, which plays an important role in the pathogenesis of preeclampsia as it does in myocardial ischaemia [8].

In conclusion, platelet number and gestational week at hospital admission time are a predictor of the prognosis of the patient.

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Abbreviations:

WBC: White Blood Count  
ALP: Alkaline phosphatase  
LDH: Lactic dehydrogenase

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