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### **Evaluation of the Usefulness of the Serum Estriol (E3) Estimation in Preterm Delivery**

Ocena przydatności oznaczania poziomu estriolu (E3) w porodzie przedwczesnym

The preterm delivery is still a valid medical and socio-economical problem. It is connected with prematurity and increase of perinatal mortality and morbidity of fetuses and newborns. Most patients who had preterm labor were reported to have earlier abortions (19); the others had had internal diseases, especially cardiovascular and kidney, EPH gestosis, viral infections and anaemia (9).

In pregnancy estrogens are produced mainly in placenta (1, 2, 7). It is thought that estriol is mainly of fetus origin (7, 8, 11), therefore it is the most often examined factor of fetoplacental unit (12, 21). The amount of estriol is the biggest among estrogens produced in pregnancy; thus the decrease of E3 levels may be regarded as the signal of fetal distress (3, 17). The dependence between cardiotocography and estriol values in the fetus condition was noticed (16, 22). An interesting observation is the correlation between the estriol levels and the newborn weight (4, 6, 10). The lower E3 was reported in IUGR (8), and in EPH gestosis (15). Hughes et al. (8) emphasize the purposefulness of estriol estimation in prolonged pregnancy and diabetes. There is a hypothesis about the E3 role in stimulation of labor mechanism because in the last weeks of pregnancy the increasing values of hormone were noticed (5, 9, 20).

The aim of this study was the evaluation of serum estriol levels in pregnancy threatened by preterm delivery.

## MATERIAL AND METHODS

80 pregnant women were accepted for hospital treatment because of threatened preterm delivery. The age of patients ranged from 18 to 37 years, the average was 26.3. The examined group included 37 primiparities and 43 multiparities; 17 had spontaneous abortions, 12 preterm labors, in 4 cases occurred both abortion and preterm delivery. There were 35 pregnant women from rural and 45 from urban areas. The advancement of pregnancy was determined on the basis of interview, obstetrical examination and ultrasonography. Regular, painful contraction appearing not less frequently than one every 10 minutes felt by the pregnant woman and confirmed by cardiotocography were taken as a symptom of the preterm delivery. The control group were 75 healthy pregnant women coming to control examination. For a more precise estimation and comparison of the results all the pregnant women were divided into 3 groups with regard to the advancement of pregnancy: I from 29 th to 31 st week, II from 32 nd to 34 th, and III from 35 th to 37 th week of pregnancy. Blood for hormonal examination in tested groups was obtained before medical treatment between 8 and 9 a.m. Tests were performed in Laboratory of Radioimmunoassay using Amerlex Oestriol unconjugated E3 RIA Kit from Amersham International UK (code Im 2041). The data were statistically analysed and shown in the table and in the figure. All results are expressed as means  $M \pm SD$ . The difference between means was tested using Student's test for independent means. In all studies a significance level of  $p < 0.05$  was used.

## RESULTS AND DISCUSSION

Estriol is an important marker of fetal condition and growth (2, 5). Mathur and Langrebe (13) noticed that only E3 increases up to delivery time. The examinations showed the constant increase of unconjugated estriol with the pregnancy advancement (Tab. 1). Smit and Essed (18) also observed the increase of E3 level, but there was no correlation between this hormone and uterine contractions. Our examination of preterm delivery confirmed that there were higher E3 values in comparison with physiological pregnancy, especially in the age groups II and III (Fig. 1). The results in spite of their statistical significance can be critically viewed because there were great individual differences in the examined groups.

Table 1. Mean estriol values (ng/ml) in threatened preterm delivery

Age pregnancy group	Examined group		Control group		<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
I 29—31	9.5	4.3	8	2.19	>0.1
II 32—34	12.4	4.91	10.1	2.46	<0.05
III 35—37	15.3	6.67	11.5	4.3	<0.03

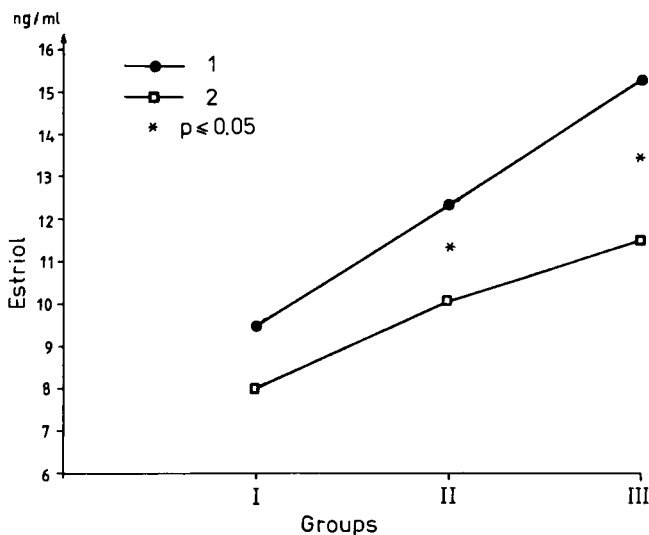


Fig. 1. Serum estriol levels in threatened preterm delivery; 1 — examined group, 2 — control group

### Conclusions

1. The serum E3 levels in preterm delivery were higher in all age groups of pregnancy.
2. The estimation of mean estriol concentrations may be helpful in the examination of fetoplacental unit together with other diagnostic methods.
3. On the basis of E3 examination it is difficult to evaluate properly the pregnancy threatened by preterm delivery.

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## STRESZCZENIE

Oznaczano poziom estriolu w surowicy krwi ciężarnych zagrożonych porodem przedwczesnym. Grupę badaną stanowiło 80 kobiet ciężarnych przyjętych do leczenia szpitalnego z powodu skurczów mięśnia macicy. Do grupy kontrolnej zaliczono 75 zdrowych ciężarnych zgłaszających się do poradni przyszpitalnej. Celem dokładniejszej oceny i porównania wyników wszystkie ciężarne podzielono na 3 grupy wiekowe ciąży. Stężenie estriolu oznaczano radioimmunologicznie, używając zestawów RIA Estriol Amersham International UK. Badania wykazały wyższe poziomy estriolu we wszystkich grupach wiekowych ciąży zagrożonej porodem przedwczesnym. Różnice te były istotne statystycznie od 32 do 37 tygodnia ciąży. Wydaje się, że oznaczanie poziomu estriolu w surowicy krwi ciężarnych zagrożonych porodem przedwczesnym może być przydatne w diagnostyce ciąży zagrożonej przedwczesnym jej zakończeniem.