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### **The Estimation of Progesterone (P) in Preterm Delivery**

Oznaczanie poziomu progesteronu (P) w porodzie przedwczesnym

Preterm delivery, its diagnosis and progress in treatment are at present one of the most important problems of perinatology. World Health Organisation suggests the term preterm delivery for pregnancy from 23 to 37 weeks. The occurrence of preterm delivery is from 4% in Sweden and Holland (4), to 34% in India (5).

Etiology of preterm delivery remains unknown in most cases, that is why many authors look for various causes of that disease (1, 3, 5, 13). Creasy (2) thinks that the most dangerous factors are: age below 18, urinary tract infections, bleeding after 12 weeks of gestation, uterine irritability, placenta praevia, polyhydramnion, multiple pregnancy and abdominal surgery.

Progesterone (P) in late pregnancy is produced mainly by placenta with a little participation of the fetus (11). It is generally considered to be a protective pregnancy hormone (6, 10, 11) which can reduce contractility of uterus and salpinx, and together with estrogens and prolactin causes the growth of breast (7). Csapo (3) described the mechanism of progesterone block. The high level of P obstructs the presence of uterus contractions; in the stage of P domination myometrium does not react to oxytocin (4). Fuchs and others (1, 5, 12) used high doses of gestagens in the treatment of threatened preterm delivery. Despite its role in mother's organism, it is an important precursor of fetal corticosteroids and androgens (8). P estimation in blood so far has not been used in late pregnancy too often.

The aim of this study was to determine the initial concentrations of progesterone in pregnant women serum with threatened preterm labor.

## 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 contractions 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 regarding the advancement of pregnancy: I from 29<sup>th</sup> to 31<sup>st</sup> week, II from 32<sup>nd</sup> to 34<sup>th</sup> and III from 35<sup>th</sup> to 37<sup>th</sup> 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 commercial Progesterone Kit manufactured by Sorin Biomedica Italia. 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

Among steroid hormones the value of progesterone estimation which plays the protective role in pregnancy is important (1, 3, 6). It has been noticed that the level of P was higher with the advancement of pregnancy what is illustrated in the Figure 1. Mathur et al. (9) showed however, that the reduction of P value

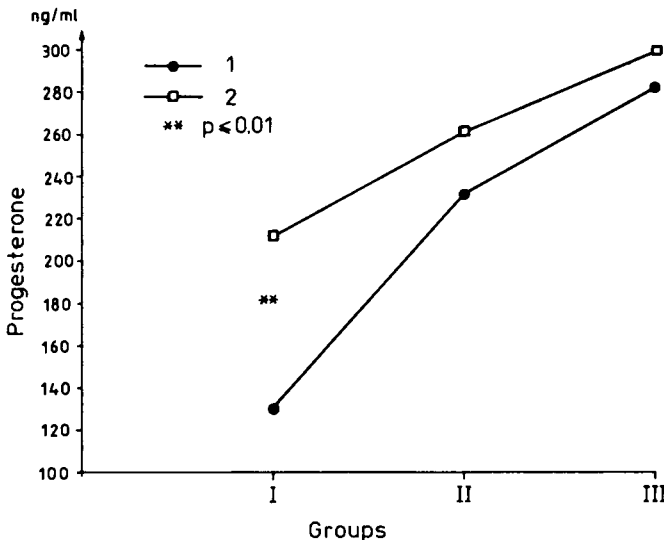


Fig. 1. Serum progesterone levels in threatened preterm delivery; 1 — examined group, 2 — control group

appears 2—3 weeks before a delivery. The dependence between the low progesterone level and the occurrence of preterm birth was noted by others (3). Kauppila et al. (6) applied high doses of gestagens and obtained the results comparable with the beta mimetics therapy. In pregnancy threatened by preterm labor the progesterone levels were lower than in normal pregnancy. It is especially seen in age group I (Tab. 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 progesterone 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>	
29—31	131.2	39.6	212.1	56.7	<0.001
32—34	232.3	112.5	261.6	63.2	>0.20
35—37	282.3	131.8	299.4	118.9	<0.60

### Conclusions

1. The level of serum progesterone in pregnant women with threatened preterm delivery was lower than in normal pregnancy.
2. It seems that the estimation of mean concentrations of progesterone can be useful in diagnosis of preterm labor.

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Otrzymano 1995.11.23.

#### STRESZCZENIE

Badania przeprowadzono u 155 kobiet ciężarnych leczonych w Oddziale Położniczym i Przychodni Ginekologiczno-Położniczej Wojewódzkiego Szpitala Zespolonego im. Jana Bożego w Lublinie. Oznaczano poziom progesteronu w surowicy krwi ciężarnych zagrożonych porodem przedwczesnym. Celem dokładniejszej oceny i porównania wyników wszystkie ciężarne podzielono na 3 grupy wiekowe ciąży, od 29. do 37. tygodnia jej trwania. Progesteron (P) oznaczano metodą radioimmunologiczną przy użyciu zestawu RIA produkcji SORIN Biomedica (Italia). Nasze badania wykazały niższe stężenia progesteronu we wszystkich grupach wiekowych ciąży zagrożonej porodem przedwczesnym. Różnice te były wysoce istotne statystycznie w ciąży od 29. do 31. tygodnia. Na podstawie przeprowadzonych badań stwierdzono dużą wartość diagnostyczną oznaczeń badanego hormonu w ciąży zagrożonej porodem przedwczesnym. Wydaje się, że oznaczenie poziomu progesteronu w surowicy krwi ciężarnych zagrożonych porodem przedwczesnym może być przydatne w diagnostyce ciąży zagrożonej, łącznie z innymi metodami diagnostycznymi.