

SERUM LACTIC DEHYDROGENASE (SLDH) ACTIVITY IN MATERNAL AND CORD BLOOD IN ANEMIA OF PREGNANCY AND NORMAL CONTROLS

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SUMMARY

Serum lactic dehydrogenase (SLDH) activity was investigated in a group of 77 pregnant women at term with anemia of pregnancy (Hb under 10 g/dl), and in 61 cord blood samples of their newborns. 107 healthy pregnant women (Hb above 11 g/dl) and 62 cord blood samples from their newborns served as control. No statistically significant difference was found between the two groups as for the SLDH activity. It is possible that the isoenzymes LDH 3 and LDH 4, which are probably of placental origin, are affected during pregnancy, but the study of these isoenzymes will make the subject of a future investigation.

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About 95% of pregnant women with anemia have the iron deficiency type. Pregnancy increases the woman's iron requirements because an increase of about 30% in the total blood volume is necessary to meet the needs of the enlarged uterus and augmented vascular system. Repeated pregnancies may result in a severe iron deficiency and many women, anemic before pregnancy, never "catch up" during or after delivery. On the other hand, severe iron deficiency anemia is associated with an increased perinatal morbidity and mortality⁽¹⁰⁾.

The aim of the present study was to examine the activity of serum lactic dehydrogenase (SLDH) in the blood of anemic pregnant women and afterwards in the cord blood of their newborns, in order to determine whether the enzymatic activity in these cases differs from that in healthy pregnant women, and whether the SLDH activity may help to diagnose the anemia of pregnancy still in the phase of "physiologic anemia".

MATERIAL AND METHODS

The SLDH activity was examined in a group of 186 pregnant primiparae aged 18 to 24 years, and in a number of 123 cord blood samples from these women's newborns, that is in a total number of 309 blood samples. According to the hemoglobin value, the women were divided into two groups: I) 77 pregnant women with anemia (hemoglobin under 10 g/dl). Of these women, the SLDH was examined in 61 umbilical cord blood of their newborns. II) 109 healthy pregnant women who served as control. In this group, SLDH activity was determined in 62 samples of cord blood.

The maternal blood for the determination of hemoglobin and SLDH was collected short time before delivery, but not during labor. Cord blood for the determination of the enzymatic activity was withdrawn carefully (not by milking) in order to avoid hemolysis. Samples of hemolyzed cord blood were excluded from the study.

SLDH activity was determined according to the method of Wacker *et al.*⁽¹²⁾. The principle of this method is the following: SLDH catalyzes the reaction: Lactate + NAD⁺ \rightleftharpoons pyruvate + NADH + H⁺. The reduction of NAD⁺ proceeds at the same rate as the oxidation of lactate and

Table 1. — *The SLDH activity in anemic and normal pregnant women, and in cord blood of their newborns.*

Groups of study	No. of cases	SLDH level, mIU	
		Mean value	Range
Anemic pregnant women	77	213.3	120- 490
Healthy pregnant women	109	213.1	40- 405
Newborn cord blood: From anemic mothers	61	395.9	106- 800
From healthy mothers	62	456.6	250-1310

in equimolar amounts. The rate at which NADH is formed can be determined by increase in absorbance at 340 nm. The result is read on the spectrophotometer and is given in mIU/ml (it is to be mentioned that 1 IU/liter = 1 mIU/ml. The normal values for our laboratory are: 100-250 mIU).

RESULTS

From the table 1 the SLDH activity in pregnant anemic and healthy women, and in the cord blood of their newborns can be seen. From this table we can observe that the mean values of SLDH activity do not differ between the group with anemia of pregnancy (Hb under 10 g/dl) and the control group (Hb above 11 g/dl). At the same time, the mean value of SLDH in cord blood is greater in the control group (456.6 mIU) as against only 395.9 mIU in the cord blood of newborns from anemic mothers.

The statistical analysis is presented in table 2, in which the SLDH activity in the two groups of women, the group of anemic pregnant women (I), and the control group (II), and the umbilical cord blood of newborns from the two groups is compared. The statistical analysis was made by the Students' t test. As it may be seen there is no statistically significant difference between the anemic group and the control group, concerning the SLDH activity neither in the maternal nor in the cord blood.

DISCUSSION

The activity of the diverse enzymes during pregnancy has been the subject matter of numerous studies published until now. It is understandable that enzymes of placental origin such as oxytocinase and leucine aminopeptidase, that may reveal the activity of the fetoplacental unit, have constituted the theme of many works⁽¹⁻³⁾, but at the same time the activity of other enzymes as well, non specific in pregnancy, has been studied in pregnant women. Among these enzymes, SLDH activity occupies a prominent place.

LDH is an enzyme normally present in the cell and passing in serum by the increase in permeability or by the cell destruction. LDH helps the anaerobic metabolism of carbohydrates, catalyzing pyruvate to lactate.

Table 2. — *SLDH activity in anemic pregnant women and cord blood of their newborns, as compared to that in the control groups, respectively.*

	Mean value, \bar{X}	"t" value	\pm SD	P
<i>Maternal blood</i>				
Anemic pregnant women	212.3	0.086	65.84	P>0.50
Healthy pregnant women	213.1		59.91	non significant
<i>Cord blood of newborns</i>				
From anemic mothers	359.9	1.774	156.78	P>0.05
From healthy mothers	456.6		217.51	non significant

The activity of most enzymes is increased during the normal pregnancy. The majority of Authors showed that SLDH activity also increases in pregnancy^(4, 11) although there are others who deny this fact⁽⁷⁾, showing that SLDH activity remains unchanged during the whole course of a normal pregnancy.

If the researchers' opinions are contradictory as for the SLDH activity in normal pregnancy, there is a general consensus that this activity increases in pathological pregnancies, i.e. severe preeclampsia, chronic hypertension, as well as in normal dysfunctional labor⁽⁶⁻⁹⁾.

To the best of our knowledge this is the first time SLDH activity is examined in anemic pregnant women and their newborns. In our study we have found no statistically significant differences between the two groups of anemic and healthy pregnant women and their newborns.

It is well known that in pregnancy LDH₃ and LDH₄ isoenzymes are of placental origin⁽⁵⁾. If total SLDH activity did not change in cases of anemia of preg-

nancy, it is conceivable that LDH isoenzymes could be affected. This study will be the subject of a subsequent investigation.

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