

RED CELL ENZYMES IN PREGNANCY AND LABOUR

by

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It is an established fact that a number of serum enzymes are affected during pregnancy. A survey of literature shows that pyruvic kinase, catalase, cholinesterase and carbonic anhydrase activity in the red blood cells during pregnancy and labour has not been studied. Consequently the present investigation was undertaken to study the changes in the activities of pyruvic kinase, cholinesterase, catalase and carbonic anhydrase in erythrocytes during pregnancy and labour.

Material and Method

Ten non-pregnant women and twenty-five pregnant women in the third trimester were selected for the study. Erythrocytes were separated from blood as described by Michel (1949). Cholinesterase was estimated by the method of Michel (1949). Carbonic anhydrase was determined by electrometric method of

Karl *et al* (1948). Catalase activity was determined by the technique used by Blacerzak (1966). Pyruvic kinase was estimated by the method of Nath *et al* (1966).

Observations

It is evident from Table 1 that the activity of pyruvic kinase, cholinesterase, catalase and carbonic anhydrase is not significantly changed during pregnancy.

During labour, the activity of pyruvic kinase cholinesterase and catalase increases while that of cholinesterase decreases. The activity of carbonic anhydrase does not show any significant change.

Discussion

Pyruvic kinase catalyzes a glycolytic step responsible for the production of adequate energy for metabolic purposes. The observed elevated level of pyruvic kinase may possibly be due to the in-

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TABLE I

Showing the Activity of Pyruvic kinase, Cholinesterase, Catalase and Carbonic anhydrase in Erythrocytes of Non-pregnant and Pregnant women

Enzyme	Non-pregnant women	Pregnant women	During labour.
x Pyruvic kinase/me of R.B.C. in units	32.6 ± 2.9	31.9 ± 2.7	62.8 ± 5.8
Cholinesterase (DpH Lr per me R.B.C.)	0.781 ± 0.01	7.87 ± 0.010	0.482 ± 0.02
xx Catalase per me of R.B.C. per 10 seconds	69.3 ± 5.8	68.4 ± 4.8	95.5 ± 4.2
xxx Carbonic anhydrase per qp ml of R.B.C. in units	13.8 ± 2.3	12.9 ± 1.9	12.1 ± 1.8

x One unit converts 0.01 mg of pyruvate to phosphoenol pyruvic acid.

xx Expressed as milliequivalent of hydrogen peroxide decomposed.

xxx One unit displaces hydrogen ion concentration from pH 8 to 6.3 in 50 seconds.

crease in the proportion of glucose passing down the Meyerhoff scheme during labour for production of adequate energy.

It is observed that the activity of cholinesterase decreases during labour. The role of the acetylcholinesterase on the cell permeability and stromal phospholipid have been postulated (Auditore and Hartman 1958; Desandre and Ghite 1958). The activity of this enzyme decreases possibly due to change in cell permeability or stromal phospholipid turn over during labour. The increased erythrocyte catalase activity may possibly be explained by Zuekerkandt's hypothesis of non-genetic compensatory increase in the synthesis of polypeptides. It appears that during labour, non-genetic synthesis of catalase is favoured, causing elevation in the level of catalase.

Summary

The activity of pyruvic kinase, choline-

sterase catalase and carbonic anhydrase is not affected during pregnancy. During labour, the activity of pyruvic kinase and catalase increases while that of cholinesterase is decreased. The activity of carbonic anhydrase is not affected.

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