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Leucocytosis of Parturition.*

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The object of the present investigation was to ascertain if the increased numbers of leucocytes mobilized into the blood of pregnant women during labor were different chemically, and hence probably immunologically, from leucocytes already present. For this purpose, the lipid composition of the white blood cells was determined early in labor and again just before applying anesthesia prior to delivery. As previously demonstrated,[1] changes in lipid composition may be taken as evidence of changes in physiological activity of leucocytes. A demonstrable increase in the activity of blood leucocytes during labor would indicate that the leucocytosis of labor is a valuable defence mechanism against infection during delivery. No significant change in the lipid content of the white blood cells at this time would suggest that the leucocytosis is probably a coincidental phenomenon secondary to the muscular exercise of parturition. Evidence herein reported tended toward the latter view.

A study was made of 14 patients from the obstetrical service of the Kingston General Hospital. A sample of blood was taken as soon as labor had definitely begun and as early in labor as possible. A second sample of blood was taken just before anesthesia prior to delivery. Both samples were heparinized and a complete blood count, differential leucocyte count and the lipid content of the white blood cells determined on each. The method of separating and analyzing the white blood cells has been described.[2] The average length of time between the first and second samples of blood was 10 hours, the shortest interval was 3 hours and the longest was 25 hours. The patients were in all respects normal parturients, 8 being primiparous and 6 multiparous.

The average total leucocyte count in early labor was 7,100 cells per cmm., the lowest being 4,300 and the highest 10,000. The average total count at the end of labor and before anesthesia was 8,000, the lowest count being 5,700 and the highest 11,200. The average increase was 1,700 cells with a standard deviation of 1,060 cells. There occurred a leucocytosis in every instance, a leucocytosis which

* This work was aided financially by the Alice F. Richardson Fund of the Kingston General Hospital.

1 Boyd, E. M., *Surg. Gynecol. and Obstet.*, 1935, **60**, 205.

2 Boyd, E. M., and Stevenson, J. W., *J. Biol. Chem.*, 1937, **117**, 491.

was statistically significant and averaged approximately an increase of 24% in the number of white blood cells. There was no significant change in the differential count between early and late labor.

A statistical summary of the lipid values is presented in Table I. The average value in early and late labor, the average difference and the standard deviation of the average difference are shown. Standard deviation was calculated by means of a formula previously used.[2] The lipid content of the blood leucocytes was found lower, on the average, in these pregnant women than in non-pregnant women, confirming previous studies.[3]

TABLE I.
The Lipid Content of the White Blood Cells in Late Compared with Early Labor.

Value	Aver. Early Value mg. %	Aver. Late Value mg. %	Aver. Difference mg. %	Standard Deviation of Difference mg.
Total lipid	968	1057	+89	338
Neutral fat	140	170	+30	158
Total fatty acids	555	645	+90	217
" cholesterol	214	243	+29	57
Ester "	49	57	+ 8	33
Free "	165	186	+21	60
Phospholipid	583	669	+86	218

In the majority of instances there were small increases in the lipid values during labor. On the average all of the lipid values were slightly increased. But variations were so marked that it was impossible to conclude that parturition had any *significant* effect on the lipid content of the leucocytes. All of the average increases were within the range of the experimental error of the method.[4]

Since there is no marked change, if any, in the lipid composition of the blood leucocytes during parturition, there is probably no change in their individual physiological activity. Any increased resistance to infection conferred on the parturient woman by the leucocytosis of labor must be due to increased numbers of leucocytes or to increase in the opsonic power of the serum and not to more active leucocytes.

Summary. No significant change occurred in the lipid composition of the white blood cells of 14 patients during parturition, suggesting that the leucocytosis of parturition is not accompanied by the mobilization into the blood of a more active type of white blood cell.

[3] Boyd, E. M., *Surg. Gynecol. and Obstet.*, 1934, **59**, 744.

[4] Boyd, E. M., *J. Lab. and Clin. Med.*, 1936, **21**, 957.