Polymorphonuclear Leucocyte Count in Diagnosis of Infection in the Newborn

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Haider, S. A. (1972). *Archives of Disease in Childhood*, 47, 394. **Polymorphonuclear leucocyte count in diagnosis of infection in the newborn.** Polymorphonuclear leucocyte counts were done in 200 infants at weekly intervals during the newborn period. In over 80% of the babies the count was below 7000/mm³. The count in 36 neonates with bacterial infection was found to be higher than the normal, in particular in the 18 infants with internal infection.

Polymorphonuclear leucocytosis has for a long time been accepted as useful in the diagnosis of bacterial infection in adults and older children. In the newborn, however, the count is not generally considered valuable.

In another communication (Haider, 1972), the role of serum IgM was discussed. What follows is in fact an extended report on that study. The purpose of this paper is to examine the role of polymorphonuclear leucocyte count (PLC) in the diagnosis of infection in the newborn.

In addition to the routine weekly estimation the count was also done within 24 hours of the appearance of the infection.

Result

The results are tabulated in Tables I-IV. For clinical details reference should be made to the earlier communication (Haider, 1972).

In over 80% of the normal NBW (normal birth-weight, i.e. weighing over 2.5 kg at birth) babies, the PLC was below 7000/mm³ during the neonatal period (Table I). In normal LBW (low birthweight,

i.e. weighing 2.5 kg or less at birth) infants, the PLC in about 80% was below 6000/mm³ during the newborn period (Table II). In NBW babies

TABLE II
Weekly PLC* in 100 Normal LBW Infants During Neonatal Period

PLC/mm ³	No. of Infants			
	1st Week	2nd Week	3rd Week	4th Week
Less than 7000	91	91	99	91
Less than 6000	70	79	85	78

*PLC = Polymorphonuclear leucocyte count.

the count tended to fall with age but this feature was not so noticeable in LBW babies during the neonatal period.

The PLC in 15 NBW infants with infection (8 with superficial infection of skin, eyes, umbilical cord, tongue, or breast, and 7 with internal bacterial infection of gastrointestinal tract, urinary tract, or meninges) is tabulated in Table III. In all the

TABLE I
Weekly PLC* in 100 Normal NBW Infants During Neonatal Period

PLC/mm ³	No. of Infants			
	1st Week	2nd Week	3rd Week	4th Week
Less than 7000	85	82	88	96
Less than 6000	41	53	72	85

*PLC = Polymorphonuclear leucocyte count.

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TABLE III
PLC* in NBW Infants with Infection During Neonatal Period

PLC/mm ³	No. of Infants with Superficial Infection	No. of Infants with Internal Infection
7000 over	3	4
under	5	3
6000 over	6	7
under	2	0

*PLC = Polymorphonuclear leucocyte count.

7 infants with internal infection the PLC was over 6000/mm³. Of the 21 LBW infants with infection (10 with superficial and 11 with internal infection) the PLC in all 11 cases with internal infection was over 6000/mm³ and in 8 of these the count was over 7000/mm³. In 9 of the 10 cases with superficial infection the PLC was over 6000/mm³.

Discussion

Xanthou (1970) has reviewed the literature and has established the leucocytic blood picture in normal term and premature infants during the newborn period. After the first 3 days of life PLC exceeding 7000/mm³ was not found in her cases. She (Xanthou, 1968) has further shown that in newborn babies suffering from infective illness the absolute values of polymorphonuclear leucocyte were generally higher than in the normal babies. In such cases PLC of over 7000/mm³ as well as significant daily differences in the count were often found after 3 days of life.

This study differs from hers in some respects. The number of cases was significantly greater than in her study. The counts, however, were done at more frequent intervals and in more detail by her. Something may also be said about the standard of the count and percentage error. The purpose of this study was to assess the clinical value of the PLC which could be generally available in all the hospitals, especially the less privileged ones.

The findings in the normal neonates (NBW and LBW) are fairly well in agreement with Xanthou's (1970)—the PLC in well over 80% is below 7000/mm³. It may be observed (Tables III and IV) that in none of the 7 NBW and 11 LBW infants with internal bacterial infection was the PLC less than 6000/mm³, and in general the results of this study on the neonates with infection do not significantly differ from that of Xanthou's (1968). On detailed analysis, however, the PLC in the NBW newborns with superficial infection is not significantly different from the normal (Fisher's exact test—at 7000 $P = 0.37$ and at 6000 $P = 0.25$), but in those NBW infants who had internal infection the PLC is significantly higher than the normal

TABLE IV
PLC* in LBW Infants with Infection During Neonatal Period

PLC/mm ³		No. of Infants with Superficial Infection	No. of Infants with Internal Infection
7000	over	3	8
	under	7	3
6000	over	9	11
	under	1	0

*Polymorphonuclear leucocyte count.

(at 7000 $P = 0.018$ and at 6000 $P = 0.00052$). In LBW babies with superficial infection the proportion with PLC higher than 7000/mm³ does not significantly exceed that in the controls ($P = 0.16$), but there is a significantly higher proportion with PLC above 6000 ($P = 0.000050$). The PLC in LBW infants with internal infection is significantly higher than normal (at 7000 $P = 0.000000064$ and at 6000 $P = 0.00000016$). In conclusion it appears that PLC may be helpful in the diagnosis of infection in the newborn, in particular the negative value of the count is quite significant—in none of the 18 newborn infants with internal bacterial infection was the PLC below 6000/mm³.

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