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THE INCIDENCE OF MICROCYTOSIS IN THE NEWBORN (POSSIBLE ALPHA – THALASSEMIA) IN THE TABUK REGION OF SAUDI ARABIA*

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The high prevalence of α -thalassemia in Saudi Arabia among the Shiites in the oasis (about 30%) has been well-documented[1,2]. According to a recent report, an even higher incidence (80%) of α -thalassemia was seen in Madang, Papua, New Guinea[3]. When the senior author of this paper visited Tabuk Maternity and Children's Hospital in Saudi Arabia in 1984, the incidence of microcytosis in the newborn of this region, which he presumed was most likely related to thalassemia syndromes, drew his interest.

Material and Methods

Hemoglobin (Hb), red blood cell count (RBC), mean corpuscular volume (MCV), mean corpuscular hemoglobin (McHb) and white blood cell (WBC) count determinations were carried out on 69 heparinized cord blood samples taken at random from newborns who had been delivered at Tabuk Maternity and Children's Hospital using the Coulter Counter Model M. In addition, a differential diagnosis was made by examining peripheral blood smears.

Results and Discussion

Hemoglobin values ranged between 10 and 21 g/dl with a mean of 16.35 ± 2.25 g/dl, RBC counts also showed a marked range, between 2.963 × 10^6 and 6.895 ×/10^6 µl, the mean being 4.687 ± 0.684 × 10^6/µl. The mean MCV and MCHb values of these infants were 106.6 ± 14.5 fl (range 89-125 fl) and 35.5 ± 4.8 pg (range 23-43.7 pg), respectively (Table I). The MCV values of eight infants were less than 100 fl, and with one exception, their Hb values were less than 14.7 g/dl. The MCHb values of these eight infants were less than 31 pg. The MCHb values

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TABLE I: Cord Blood Values of 69 Newborns Delivered at Tabuk Maternity and Children's Hospital

	Mean	SD	Range
Hb (g/dl)	16.35	2.25	10 – 21
RBC ($\times 10^6/\mu l$)	4.687	0.684	2.963 – 6.895
MCV (fl)	106.57	14.50	89 – 25
MCHb (pg)	35.54	4.78	23 – 43.7
WBC (/µl)	17.057	6.997	5335 – 40295

of another four subjects were also lower than 31 pg, but their MCV and Hb values were not low, therefore they were not included in the group of eight newborns with microcytosis.

The MCV values were evaluated according to our previous study involving Turkish newborns[4], in which we discovered that the MCV values were more than 100 fl in all the infants without hemoglobin Bart's. However, since the MCV values of eight of the newborns in the study presented were less than 100 fl, it is our opinion that these subjects had microcytosis at their age. The relatively low MCH values (< 31 pg) of these eight infants indicate that in addition to microcytosis they also had hypochromia, commonly not seen at their age. Although the mean cord Hb values were comparable to the cord values of the Turkish infants, this value was found to be low (< 14.7 g/dl) in seven of the newborns with microcytosis.

These findings indicate that microcytosis was present in 11.6% of the 69 newborns delivered at Tabuk Maternity and Children's Hospital. Microcytosis at birth might be due to iron deficiency or thalassemia. Although iron deficiency anemia in the newborn occurs as a result of feto-maternal bleeding, it is extremely rare[5], therefore we are inclined to explain this high incidence of microcytosis in association with thalassemia syndromes. Since beta thalassemia is rarely symptomatic in early infancy, we believe that this relatively high incidence of microcytosis in the newborn period is most likely related to the presence of alpha thalassemia. Of course, hemoglobin electrophoresis and erythrocytes protoporhyrin should be carried out and even more important, the alpha: non-alpha ratios of these newborns and their parents should be determined in order to be certain that alpha thalassemia is present in this particular area.

Since the infants and their mothers were discharged four hours after delivery and laboratory facilities were not available, additional studies could not be carried out.

White blood cell counts showed leukocytosis on one occasion according to adult criteria, which is expected in the cord blood and the leukocyte count can not be the only indication of infection during this period.

Summary

The frequency of microcytosis in the newborn was determined in our study carried out on 69 newborns delivered at Tabuk Maternity and Children's Hospital. Microcytosis, presumed to be associated with alpha thalassemia was documented in at least 11.5% of the subjects by using the Coulter Counter Model M.

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