SUMMARY

Vitamin A is known to fulfil a number of biological functions in various animal and human tissue during fetal life. It is required for growth, for cellular differentiation, and for normal development of fetuses.

The human fetus derives its vitamin A content from the mother through the placental circulation, which limits and controls the passage of the vitamin. Many maternal and neonatal factors have been reported to affect the delivery of nutrients and vitamin A to the fetus.

Information on maternal-neonatal vitamin A level and the factors affecting it, in Egypt, is scarce despite the well known biological importance of vitamin A during fetal life.

Vitamin A in blood consists almost entirely of retinol bound to its specific serum carrier protein, retinol-binding protein (RBP). Plasma retinol levels are used as an indicator of vitamin A status in humans when direct liver analysis is not possible by autopsy or biopsy. The cut off level of plasma vitamin A concentration is 20 μg/dl, below which a deficiency state is considered.

In our study, we measured serum vitamin A contents of 100 mothers and their corresponding newborn infants at birth. All newborn infants were full-term, apparently active babies and born by normal vaginal delivery. The mean values of plasma vitamin A and RBP in cord blood were much lower than the corresponding levels obtained from their mothers. Thirty-one percent of our neonatal group had low and deficient levels of cord serum vitamin A. This group had also significant low levels of cord serum RBP, compared to other values obtained from the neonatal groups of adequate serum vitamin A levels. On the other hand, 20% of mothers in our work had deficient levels of vitamin A in venous blood samples. The corresponding levels of cord serum vitamin A were significantly lower also.

In the present work, we studied the affection of maternal age, parity, residence and social class on vitamin A status of the newborn. We found that both maternal age and parity had no significant affection on cord serum vitamin A and RBP levels of birth. Regarding residence and social class, we reported significantly lower cord serum vitamin A values in both rural and low social class groups. But regarding fetal sex, no significant influence has been reported on our neonatal vitamin A status.

The relationship between maternal and neonatal anthropometric measurements, and vitamin A status of newborn infants at birth has been evaluated in the present study. We found no significant influence of maternal anthropometric parameters on the respective cord serum vitamin A and RBP values. The different neonatal anthropometric variables were significantly correlated with each other, as well as, with cord serum vitamin A and RBP (except for head circumference with RBP). Our study showed a highly significant correlation between vitamin A status of our neonatal group and their growth status at birth. Low and deficient vitamin A status at birth could be a potential indicator of low birth weight.

Both maternal and neonatal hematological indices (Hb and Hct) were significantly correlated with each other, as well as, with the corresponding cord serum vitamin A and RBP. The association of vitamin A deficiency and neonatal anemia has been proved in our study.

The relationship between maternal and neonatal nutritional states as judged by plasma total protein and albumin, and vitamin A status at birth as judged by cord serum vitamin A and RBP has been evaluated in the present study. Low vitamin A status of our neonatal group was associated with low nutritional status at birth.

From previous data, the importance of adequate vitamin A supply during pregnancy to prevent vitamin A deficiency and intrauterine growth retardation is recommended.