

LETTER TO THE EDITOR

RELATIONSHIP BETWEEN BIRTH WEIGHT AND ZINC STATUS OF NEWLY BORN INFANTS AND THEIR MOTHERS

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Sir,

Zinc deficiency during pregnancy has been reported to retard foetal growth and to cause chromosomal aberrations and various congenital defects in animals (1, 2, 3). Recently, low birth weight (LBW) infants and their mothers were reported to have lower serum zinc levels as compared to controls (4). This has, however, been contradicted by other workers (5, 6). The present investigation was, therefore, undertaken to try and resolve this controversy.

The investigation was conducted on 92 newly born infants and their mothers taken randomly from the Labour Room of Zenana Hospital attached to R.N.T. Medical College, Udaipur. The age range of mothers was 18-35 years. A thorough clinical examination of mothers and newborns, including routine investigations, was carried out. All mothers were healthy. None had suffered from hypertension, eclampsia etc. None had taken any hormonal preparation during pregnancy. All the infants were full-term. None had any congenital malformation.

After cutting the umbilical cord, the infants were weighed to the nearest gm on a spring baby balance (Salter, No 50). Within 5 minutes of parturition, blood samples were collected from antecubital veins of mothers and umbilical cords of infants. Strict precautions were taken to avoid trace metal contamination and haemolysis. Serum zinc was measured in each specimen in a Pye Unicam SP-1900 atomic absorption spectrophotometer (7). Statistical analysis of the data was done by Student's t-test and correlation coefficient (r).

The subjects were divided into 2 groups according to the birth weight of infants. The infants with a birth weight greater than 2,500 gm and their mothers constituted the control group (n=45). The infants with a birth weight of 2,500 gm or less and their mothers constituted the LBW group (n=47). Birth weights and serum zinc of control and LBW infants and their mothers are shown in Table I. For calculating correlation coefficients, the 2 groups were clubbed together. Correlation between birth weight and serum zinc of infants and their mothers is shown in Table II. Serum zinc of infants as well as mothers had no correlation with maternal haemoglobin level, maternal age or with the duration of labour.

TABLE I : Birth weight and serum zinc in control and LBW groups (Values are mean±SD)

	Control group	LBW group	P value
Birth weight (gm)	3023±369	2026±582	<0.001
Serum zinc of infants (µg/dl)	108.7±59.7	86.2±49.5	<0.05
Serum zinc of mothers (µg/dl)	89.5±51.4*	62.3±33.0*	<0.001

* Significantly lower as compared to serum zinc of infants (P<0.01)

TABLE II : Correlation between serum zinc of mothers and birth weight of infants.

	Correlation coefficient (r)	P value
Mothers' Vs Infants' serum zinc	0.925	<0.001
Mothers' serum zinc Vs Birth weight	0.436	<0.001
Infants' serum zinc Vs Birth weight	0.372	<0.001

LBW infants and their mothers had significantly lower serum zinc as compared to control infants and their mothers respectively. These findings differ from some earlier reports (5, 6) However, the criteria used to define LBW in these studies were different as compared to the present investigation. Our findings are in conformity with another report (4) in which the criteria of LBW were similar to those in the

present investigation. Moreover, a significant correlation was observed between birth weight and serum zinc of mothers. A significant correlation was also observed between serum zinc of infants and that of their mothers. Serum zinc of infants was significantly higher than that of their mothers. This is in conformity with an earlier report (8).

Our results thus suggest a relationship between zinc status of pregnant women and foetal growth. Maternal zinc status during pregnancy may be one of the determinants of birth weight of infants. Effect of zinc availability on foetal growth could occur in several ways. Zinc is a component of DNA polymerase, RNA polymerase and thymidine kinase (9) which are involved in cell division and growth. Zinc plays a fundamental role in protein synthesis (10) which is crucial to tissue formation. Decreased availability of zinc might impair these processes resulting in lowering of birth weight. We feel that the relationship between maternal zinc status and foetal growth, specially the effect of zinc supplementation to zinc-deficient pregnant women, merits further investigation.

P. P. SINGH*†, K. KHUSHLANI**, P. C. VEERWAL** AND R. C. GUPTA*

Departments of *Biochemistry and **Obstetrics and Gynaecology,

R. N. T. Medical College, Udaipur - 313 001

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†Corresponding Author