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Importance of Serum Copper in Pulmonary Tuberculosis of Childhood.

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Abstract:

Serum level of copper gives a valuable clue about the activity of pulmonary tuberculosis, because its high level has been found in cases of active pulmonary tuberculosis.

Introduction:

Tuberculosis still remains one of the important and common community health problems in developing countries like ours, where the incidence of this disease has been far below satisfaction. Some interesting facts have come out following the study of micronutrients like copper in blood of patients suffering from pulmonary tuberculosis. In the present study, attempts have been made to find out the role of copper in patho-physiological process of tuberculosis and its place in clinical practice.

Materials and Methods:

140 cases in the age groups of 9 months to 12 years were selected from the children

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outpatient and inpatients department of Paediatrics, of P.M.C.H., Patna. Diagnosis of Pulmonary tuberculosis was made in 100 cases by history of contact, clinical examination, E.S.R. estimation, M.T., B.C.G. test, sputum examination (examination of fasting abdominal wash in the very young cases) for A.F.B. and X-ray of chest. Routine investigations were done in Post-graduate clinical laboratory of the Upgraded paediatrics department. Copper was estimated in the Geochemical laboratory of Geology Department of Patna University by Atomic-absorption Spectrophotometry. Patients with severe degree of malnutrition (4th degree) and hepato-splenomegaly were excluded from the present study. 40 normal cases were taken up for the control group.

Observations:

Table showing serum copper level $\mu\text{gm/dl}$ in control and pulmonary tuberculosis cases.

Types of cases	No. of cases.	Range	Mean	Standard deviation $\pm$	P-value
Control	40	108-125	114.00	6.67	
Active pulmonary tuberculosis.	83	155-170	164.1	6.86	<0.001
Inactive pulmonary tuberculosis.	17	102-115	108.8	5.62	>0.001

Discussion:

Total 100 cases of pulmonary tuberculosis and 40 control cases were studied in present series. The range of serum copper level between 155-170 $\mu\text{gm/dl}$ with its mean value of 164.1 S.D. ± 6.67 in 83 cases of active pulmonary tuberculosis and with a range of 102-115 $\mu\text{gm/dl}$ and a mean value of 108.8 S.D. ± 5.62 was found in 17 inactive pulmonary tuberculosis cases. When compared to the control range level of 108-125 $\mu\text{gm/dl}$ with its mean value of 114.00 S.D. ± 6.67 in control group of 40 cases, it gives an idea of significantly high level of serum copper in cases of active pulmonary tuberculosis. More or less similar level of copper has been seen in both control as well as inactive pulmonary tuberculosis cases.

This observation of raised serum copper in cases of active pulmonary tuberculosis supports the findings of Bodgen¹ and Prasad² also, who postulated that raised level of serum copper may be considered as an evidence of active pulmonary tuberculosis. This may be due to release of cyto-plasmic and nuclear copper into extracellular compartment following invasion of cells by mycobacterium tuberculii.

Summary and Conclusion:

The raised serum copper level in active pulmonary tuberculosis may be considered an indication of active state of the disease probably due to release of intra cytoplasmic and nuclear copper following invasion of the cells by the proliferating tubercle bacilli.

Bibliography:

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