



# Serum Zinc and Copper Levels in Children with Type 1 Diabetes Mellitus

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*To the Editor:* Type 1 diabetes mellitus (T1DM) is the most prevalent (9.5%) endocrine disorder of childhood [1]. Trace elements (TE) play a role either in the pathogenesis or progress of DM. There is paucity of data on TE levels in T1DM children and hence we studied serum zinc and copper levels. A prospective case control study was conducted in a children's hospital over 2 y where 15 children aged 1-18 y with T1DM and 15 healthy age-sex matched controls were enrolled after obtaining informed consent and ethical committee approval. Children with type 2 DM and those on multivitamin medications 3 mo prior to the study were excluded. TE estimation was done by inductively coupled plasma-optical emission spectroscopy (model: Perkin Elmer Optima 5300 DV) from the serum samples. The normal serum zinc and copper levels were 600-1200 µg/L and 510-1530 µg/L, respectively. The mean ± standard deviation (SD) of zinc in T1DM children was 501.33 ± 65.36 µg/L (controls: 734.60 ± 111.28 µg/L,  $P < 0.05$ ) and mean ± SD of copper was 1828.20 ± 145.19 µg/L (controls: 1108.47 ± 276.30 µg/L,  $P < 0.05$ ) showing hypozincemia and hypercupremia.

Studies had reported that there is alteration of several TE in DM. Zinc plays an important role in the synthesis, storage and secretion of insulin and also it regulates insulin receptor intracellular events that determine glucose tolerance and pancreatic reaction to the given glucose load [2]. Low serum zinc levels in this study might be due to increased urinary loss of zinc, as hyperglycemia interferes with the active transport of zinc back into the renal tubular cells as reported

earlier [3]. Hypercupremia, as observed, might be attributed to hyperglycemia which stimulates glycation and release of copper ions from copper binding sites of proteins [4]. Our preliminary observation highlights hypozincemia and hypercupremia and large multicentric trials are needed to recommend zinc supplementation in management of T1DM.

## Declarations

**Conflict of Interest** None.

## References

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