

# Abstract

J Am Coll Nutr. 2009 Aug;28(4):388-96.

## Zinc supplementation improved cognitive performance and taste acuity in Indian adolescent girls.

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**OBJECTIVE:** To test the efficacy of zinc supplementation through diet or ayurvedic zinc tablet on cognitive function and taste acuity in adolescent girls.

**METHODS:** Using zinc-rich food items, snacks were prepared by adopting food-processing methods that enhance zinc bioavailability. Ayurvedic zinc tablet (jasad bhasma) was chosen as a natural elemental zinc supplement. Efficacy of snacks and the tablet was assessed in 180 schoolgirls (12.5 +/- 0.85 years) from Pune City, India, who were randomly allocated to any of the 3 groups: (1) ayurvedic zinc tablet-J, (2) zinc-rich snacks-D, or (3) Control-C. Supplementation was given on every school day (6 days/wk) for 10 weeks. All measurements were recorded at baseline and at the end of the study period. Food intake was recorded by 24-hour diet recall on 3 random days. Hemoglobin, serum ferritin, and plasma zinc were estimated on a fasting blood sample. Cognitive assessment was done on each participant using tests for simple reaction time (SRT), recognition reaction time (RRT), visual memory, and Raven's Progressive Matrices (RPM). Taste acuity was determined by recognition thresholds for salt (RTS) over a range of 10 different salt concentrations.

**RESULTS:** A higher increase in plasma zinc (61.3%) was observed in the J group than in the D group (9.9%) ( $p < 0.01$ ), whereas plasma zinc declined in the control group (-2.2%) over baseline ( $p > 0.1$ ). Hemoglobin showed no change in all 3 groups ( $p > 0.1$ ). Percent increment in scores for memory and RPM was significantly more in the D and J groups (24.5%-29.6%) than in the C group (6.5%) ( $p < 0.05$ ). Mean SRT and RRT were reduced more in the D and J groups (5%-16%) than in the C group (1.6%) ( $p < 0.05$ ). A significant fall in median RTS from 5 to 2.5 mmol/L was noted after both diet and zinc supplementation ( $p < 0.01$ ); however, it remained the same at 5 mmol/L in the Control group after 10 weeks.

**CONCLUSION:** Supplementation of ayurvedic zinc and zinc-rich foods are effective in improving cognitive performance and the recognition threshold for salt of adolescent girls.

PMID: 20368377