

Is Iron Deficiency Anemia Linked with Higher Lead Levels in India? A Public Health Concern

Iron deficiency and elevated lead levels are common amongst children and have the potential for long-term morbidity(1). Iron deficiency anemia (IDA) is associated with lower cognitive function and behavioral problems(2). Elevated lead levels have been associated with anemia, decreased IQ, impaired attention and speech performance, increased school failure, hyper activity and disturbed social behavior(3). It is well documented that lead is more readily absorbed in the presence of both malnutrition and iron deficiency anemia(4). Early detection and treatment of both these conditions is important.

The National Family Health Survey (NFHS-2) conducted in 1998-99 estimated lead (Pb) levels in addition to hemoglobin (Hb) in children under three years of age in Delhi and Mumbai (5). The Hb and Pb levels were estimated in 516 and 383 children in Delhi and Mumbai, respectively. We undertook an investigation to analyze the data to see the possible association of IDA with higher lead levels. We categorized the Hb levels into two categories of Normal (>11 g/dL) and Deficient (<11 g/dL). Similarly, we categorized Pb levels into two categories of Normal (<10 µg/dL) and Lead Toxicity (>10 µg/dL). We found no association of Hb and Pb levels in Delhi ($p = 0.6$) however an

association was found in Mumbai ($p = 0.01$), which was statistically significant. In such a situation, it may be difficult to conclude whether IDA is linked to higher lead levels or not. The findings of the present analyses suggest that there is a need to undertake more studies with larger sample sizes in different parts of the country to understand the important link between levels of lead and prevalence of anemia in a community.

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REFERENCES

1. Adams WG, Geva J, Coffman J, Palfrey S, Bauchner H. Anemia and Elevated Lead Levels in Underimmunized Inner-city Children. *Pediatrics* 1998; 101: 1-5.
2. Lozoff B, Brittenham GM, Wolf A W. Iron deficiency anemia and iron therapy effects on infant developmental test performance. *Pediatrics* 1987; 79: 981-985.
3. Sciarillo WG, Alexander G, Farrell KP. Lead exposure and child behavior. *Am J Public Health* 1992; 82: 1356-1360.
4. Bithoney WG. Elevated lead levels in children with nonorganic failure to thrive. *Pediatrics* 1986; 78: 891-895.
5. NFHS (2000) India 1998-1999. National Family Health Survey-2 (NFHS-2). Mortality, Morbidity and Immunization. International Institute for Population Sciences, Mumbai, 2000: 135.