Prevalence of anemia amongst overweight and obese children in NCT of Delhi

Umesh Kapil¹, Neha Sareen²
¹Professor, Public Health Nutrition, ²Department of Human Nutrition, All India Institute of Medical Sciences, Ansari Nagar, New Delhi-110029

Abstract

Introduction: Anemia amongst children has been associated with impaired cognitive functions, developmental delays, behavioral and learning disturbances. Young children from high-income groups could also be affected by anemia.

Objective: To assess the prevalence of anemia amongst overweight and obese children in the age group of 5-18 years residing in National Capital Territory (NCT) of Delhi.

Material and Methods: Total of 413 children was included in the present study. The hemoglobin (Hb) estimation was done by cyanmethemoglobin method.

Results: In the age group of 5-11 years, the prevalence of anemia amongst overweight and obese children was found to be 38.4% and 29.2%. And in the age group of 12-18 years, the prevalence of anemia amongst overweight and obese children was found to be 33.3% and 21.7%; respectively.

Conclusion: The findings of the present study revealed that there is a high prevalence of anemia amongst overweight and obese children in the age group of 5-18 years in NCT, Delhi.

Key Words: Anemia; Overweight; Obese; Delhi.
Similarly, 7.4% (n=10) overweight and 3.4% (n=2) obese children had moderate anemia (9.9-7.0 mg/dl). We did not find any child suffering from severe anemia (<7.0 mg/dl). In the age group of 5-11 years, the prevalence of anemia amongst overweight and obese children was found to be 38.4% and 29.2%, respectively. In the age group of 12-18 years, it was found that 26.2% (n=37) overweight and 19.2% (n=15) obese children had mild anemia (10.0-11.0 mg/dl). Similarly, 6.3% (n=9) overweight and 2.5% (n=2) obese children had moderate anemia (9.9-7.0 mg/dl). Only 1 child had severe anemia (<7.0 mg/dl). In the age group of 12-18 years, the prevalence of anemia amongst overweight and obese children was found to be 33.3% and 21.7%; respectively.

**Discussion**

The overall prevalence of anemia amongst overweight and obese children in the age group of 5-18 years was found to be 51.3% and 15.5%, respectively. This was higher than an earlier study conducted amongst children reported the prevalence of anemia as 38.8% amongst obese and 12.1% in overweight children.[7] Similarly, another recent study conducted amongst adolescent boys reported the high prevalence of anemia (50%) amongst overweight and obese children.[8]

A high prevalence of anemia has been documented in upper (27.3%) and upper middle (39.1%) socioeconomic class. High prevalence of anemia was also reported in upper and upper middle class (14.0% and 39.4%, respectively) among urban school children (5-15 years) of Punjab. It also found 47.6% prevalence of anemia in well-nourished urban school children of Punjab.[9]

In the study on anemia among Egyptian adolescents it was found that prevalence of anemia was relatively high among adolescents belonging to higher socioeconomic stratum (43.4%). Authors suggested that anemia in higher stratum of society may be related to their choice in dietary habits.[10]

Iron deficiency was probably the most common cause of anemia.[9] However, anemia could also be due to other factors such as, deficiencies of folate, vitamin B12 or vitamin A, chronic infections and inflammations and hemorrhages.[11]

Low intake of iron, poor bioavailability of iron from the Indian diet and rising trend of consumption of ‘empty calorie’ foods could be the other causes of anemia in the overweight and obese children.[9]

A number of etiological factors have been proposed to explain the association between iron deficiency and overweight like i) genetics influences; ii) low physical activity, leading to decreased myoglobin breakdown and thus decreased amounts of iron released into the blood; iii) imbalance diet like fast food, alcohol, high calorie diet and limited intake of iron rich foods.[12]

Recent evidence suggests that Hepcidin may be a potential mediator for anemia in obese children.[13-14] The hepcidin-mediated reduced iron absorption has been suggested.[15]

**Conclusion**

The findings of the present study revealed that there is a high prevalence of anemia amongst overweight (51.3%) and obese (15.5%) children in the age group of 5-18 years in NCT, Delhi.

**Authors Contribution**

UK: conception and design, acquisition of data, analysis and interpretation of data, drafting the article, final approval of the version, NS: acquisition of data, analysis and interpretation of data, drafting the article

**References**

study among adolescent boys in urban Meerut. India J
urban school children of Punjab. Indian Pediatr. 1998
Egyptian adolescents: prevalence and determinants. East
PMID: 12197323. [PubMed]
11. WHO Iron deficiency anemia: assessment, prevention and
12. Kaplowitz PB, Slora EJ, Wasserman RC, Pedlow SE, Herman-
Giddens ME. Earlier onset of puberty in girls: relation to
increased body mass index and race. Pediatrics. 2001
13. Giudice EM, Santoro N, Amato A, Brienza C, Calabrò P,
Wiegerinck ET, Cirillo G, Tartaglione N, Grandone A,
Swinkels DW, Perrone L. Hepcidin in obese children as a
potential mediator of the association between obesity and
iron deficiency. J Clin Endocrinol Metab. 2009
14. Nemeth E, Tuttle MS, Powelson J, Vaughn MB, Donovan A,
Ward DM, Ganz T, Kaplan J. Hepcidin regulates cellular iron
efflux by binding to ferroportin and inducing its
15. Aeberli I, Hurrell RF, Zimmermann MB. Overweight children
have higher circulating hepcidin concentrations and lower
iron status but have dietary iron intakes and bioavailability