Transferrin receptor as an iron deficiency diagnostic stable marker in diagnosing iron deficiency in among pre-pubertal obese children

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Background and Aim: Obesity and iron deficiency are two of the dramatic global problem. In Egypt, there is an emerging concern of the increasing rate of overweight and obesity as well as iron deficiency (ID) and iron deficiency anemia (IDA) among school age children and adolescent. The diagnosis of ID or IDA is challenging especially in inflammatory conditions as obesity. We aimed to assess combining the iron status indicator in ID and IDA evaluation in overweight and obese pre-pubertal children in Egypt.

Methods and Patients: This study was conducted on children from three primary schools in Egypt. The total number of children assessed for obesity during screening phase was 2910 child. 131 children with age ranging from 6-11 years from primary schools in Egypt were selected and subjected to anthropometric measurements and determination of iron status indicator; serum iron, total iron binding capacity, transferrin saturation, serum ferritin and transferrin receptor. Out of them, 96 child were obese (group 1) and 35 child were overweight (group 2).Children enrolled in the study were subjected to medical history taking, clinical examination and anthropometric measurements (weight, height and subcutaneous fat measurements). 35 child were overweight (group 2).

Results: The prevalence of obesity was 23.6% among studied children. IDA contributes about 14.5% of obese and overweight children. Serum iron and transferrin saturation levels were lower in obese group (57.5±11.8 & 17.4±8.2) vs overweight ones (75.1±16.9 &20.8±9.7) (P=0.000 & 0.048 respectively). On the contrary to what is expected the serum ferritin levels were high in both groups (obese and overweight). Transferrin receptor (sTfR) was elevated in obese vs overweight ones.

Key message: It is necessary to screen children with elevated BMI for iron deficiency. The sTfR is regarded as a more stable marker of iron levels in such condition.

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