STUDY OF IRON BIOMARKERS AND VITAMIN B12 LEVEL IN OVERWEIGHT AND OBESE INDIVIDUALS

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Summary

Traditionally, obesity has been considered a disease of "overnutrition" because it often is the result of excessive caloric intake. However, many obese individuals eat diets which are energy-dense and micronutrient-poor.

The present study aimed to assess the relation between obesity parameters and the occurrence of iron deficiency and vitamin B12 deficiency among Egyptian obese and overweight individuals. This study included 62 obese and overweight individuals as a case group, and 20 individuals with normal BMI as a control group.

All individuals were subjected to:

(A) History taking

History taking was done with emphasis on symptoms of anemia, blood transfusion, and previous or current medication therapy.

(B) Thorough physical examination.

- General examination was done with emphasis on:

Weight, height, body mass index and waist circumference.

- Cardiovascular, respiratory, abdominal, neurological, muscloskeletal as well as skin examinations.

(C) Laboratory investigations:

- Complete blood count.
- Liver biochemical tests: ALT, AST, bilirubin (total and direct), and albumin.
- Kidney function tests: blood urea and serum creatinine.
- FBS and 2-HPP.
- C-reactive protein, ESR, uric acid, TSH.

- Serum iron, TIBC, TSAT and ferritin.
- Serum hepcidin level.
- Serum level of vitamin B 12.

The results obtained were statistically analysed and summarized as follows:

- BMI categories among cases was that that 26 cases were overweight (41.9%), 26 cases were obese grade I (41.9%), 7 cases were obese grade II (11.3%), and 3 cases were obese grade III (4.8%).
- There was statistically significant high mean of PLT among cases with p-value 0.04.
- There was no statistically significant difference with p-value 0.4, 0.8, 0.7, 0.2 and 0.2 as regards Hb, MCV, MCH, HCT and WBCs respectively between both study groups.
- Hepcidin level was high in 35 cases (56.5%) compared to 6 controls (30%) with p =0.07 between the study groups, with no statistically significant correlation between BMI and hepcidin level (p=0.4). This suggests that hepcidin levels do not contribute to the development of iron deficiency in obese individuals.
- There was no statistically significant difference between study groups regarding CRP and ESR (p=0.5, 0.6 respectively), with no statistically significant correlation between BMI and CRP level (p-value 0.7, r -0.09).
- TSAT level was low in 54 cases (87.1%) compared to 20 controls (100%) with p-value =0. There was statistically significant positive correlation between TSAT and BMI (r=33, p-value =0.003), and between hepcidin level and TSAT (r=0.37, p-value =0.003).

- There was statistically significant positive correlation with p-value 0.001 and 0.01 between BMI and each of serum iron and TIBC respectively.
- There was statistically highly significant positive correlation with p-value 0.007 and 0.003 between hepcidin level and each of serum iron, and TSAT respectively.
- There was no difference was found between serum ferritin values in the obese and control groups with no statistically significant correlation between ferritin and BMI (r=-0.09, p-value =0.4), and between hepcidin level and ferritin level among cases (r=0.19, p-value =0.2). Ferritin is of less value in assessing iron status in obese persons.
- The mean vitamin B12 level was 408.1 ng/L ± 312.2 in cases compared to 342.03 ng/L ± 223.4 in controls with p-value =0.04. It's level was low in 14 cases (22.6%) compared to 3 controls (15%) with p-value =0.6. There was statistically significant negative correlation between hepcidin level and vitamin B12 level (p-value =0.008, r= -0.34), but there was no statistically significant correlation between BMI and vitamin B12 (p-value =0.2 and r= 0.14).

Limitations of the study:

- Small number was evalulated and that for financial constraints.
- Nutritional history of participants was not assessed in this study.
- The use of BMI only as an indicator of obesity/overweight among the participants.

Serum vitamin B12 was examined without assay of red cell folate and biochemical markers such as methylmalonic acid or homocysteine.