Original Article

Assessment of Iron Status in Female Metabolic Syndrome Patients

Abdur Rauf Hammad, Hina Ejaz and Muhammad Shahid Faruqi

ABSTRACT

Objective: The objective of this study to evaluate Serum iron in metabolic syndrome female patients.
Study Design: Cross-sectional study.
Place and Duration of Study: This study was conducted at the department of Physiology of Abwa Medical College, Faisalabad from January 2021 to July 2022.
Materials and Methods: We were registered 100 healthy women as control and 100 metabolic syndrome female patients were enrolled as test. Exclusion criteria respiratory, renal, thyroid disorders subjects, suffering from cardiovascular, liver disease. Blood pressure was taken and measured waist circumference, height and weight and calculated BMI . blood was taken at aseptic precaution and sent for Biomolecules assay of plasma glucose, TIBC, ferritin, creatinine, serum glutamate pyruvate transaminase, serum iron. Biochemistry samples were analyzed by MIcrolab 300 and kits used of Merk Pvt. SPSS used for statistical analysis.
Results: Result showed that Fasting blood glucose (145.7± 4.2) and total triglyceride (280.3 ± 31.2) were significantly higher in test subjects. Systolic and diastolic blood pressure was also higher in test subjects. in test subject. It was found that serum ferritin (204.46 ± 23.63) was significantly higher and TIBC was significantly lower. Some parameter were not significant in both groups (Serum iron and TS).
Conclusion: Our study results showed that metabolic syndrome is associated with higher iron status in female patients.

Key Words: Serum Iron**,** metabolic syndrome

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INTRODUCTION

Major threats to human health are obesity and Diabetes which are also interrelated cardiovascular risk factors it is known as metabolic syndrome.[1,2]
prevalence of MetS is about 20-25%.[3] In oxygen transport, Iron play important role and also in respiratory chain enzymes in mitochondria its redox state is changed by TCA cycle.[4-6] Cell injury and expiry is produced by inflammatory response which is the cause of oxidative stress.[7] Ferritin stored in different organs in body such as(spleen, macrophage and liver).[8] Serum iron is reduced due to inhibiting passing from cell by Hepicidin and maintained Systemic iron homeostasis.[9] For indicators of iron status are Iron, TIBC, and transferrin saturation.[10] Positive association is exist of metabolic syndrome with iron and also with hyperferritinaemia in various studies.[8-10-12]

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In some studies, Ryu et al showed that there is no association of metabolic syndrome with serum iron.[13]High level of saturation of transferrin in metabolic syndrome caused Hyperferritineimia normally. [14-15] It is also found normal level of iron in metabolic syndrome In some studies showed that it is found that iron level is at baseline in metabolic syndrome.[16] It was cross sectional study which was planned to elevate iron status in metabolic syndrome female patients.

MATERIALS AND METHODS

We were registered 100 healthy women as control and 100 metabolic syndrome female patients were enrolled as test. Exclusion criteria respiratory, renal, thyroid disorders subjects, suffering from cardiovascular, liver disease. Blood pressure was taken and measured waist circumference, height and weight and calculated BMI . blood was taken at aseptic precaution and sent for Biomolecules assay of plasma glucose, TIBC, ferritin, creatinine, serum glutamate pyruvate transaminase, serum iron. Biochemistry samples were analyzed by MIcrolab 300 and kits used of Merk Pvt. SPSS used for statistical analysis.

RESULTS

Result showed that Fasting blood glucose (145.7± 4.2) and total triglyceride (280.3 ± 31.2) were significantly higher in test subjects. Systolic and diastolic blood

pressure was also higher in test subjects. in test subject. It was found that serum ferritin (204.46 ± 23.63) was significantly higher and TIBC was significantly lower. Some parameter were not significant in both groups (Serum iron and TS).

Table No.1: Test subjects and Control subjects for basic parameter

	Test subjects (n=100)	Control (n=100)
SBP/DBP (mm Hg)	145/95+ 3.4	130/83 + 3.2
Body weight (Kg)	80.9 + 13.5	71.2 + 12.2
BMI (kg/m2)	30.5 + 3.8	21.8 + 3.4

Table No. 2: Biochemical profile of Test subjects and Control subjects

Control subjects (n=100)	Test Subjects (n=100)
Fasting Blood Glucose(mg/dl)	
97.8 ± 4.3	145.7± 4.2
Total Cholesterol (mg/dl)	
253.5 ± 12.8	192.6 ± 31.5
LDL (mg\dl)	
116.9 ± 21.5	113.5± 18.3
HDL (mg\dl)	
42.77± 8.5	47.3 ± 9.1
Triglycerides (mg\dl)	
199.2 ± 32.5	280.3 ± 31.2

Table No. 3: Assessment of serum iron in test subjects and control subjects

Test subjects (n=100)	Control subjects (n=100)
Ferritin ng/mL	
204.46 ± 23.63	55.63 ±23.24

DISCUSSION

In various studies showed that hepcidin is increased in adipose tissue, pancreas and liver after released of inflammatory cytokines.[17] Iron transfer from cell the is impaired after degradation and internalization of ferroportin due to hepcidin.[18-19] In a non–classical secretory pathway, Serum ferritin is produced in macrophage loaded ferritin.[17,20] or damaged cell of liver or leakage.[21]Major threats to human health are obesity and Diabetes which are also interrelated cardiovascular risk factors it is known as metabolic syndrome. Prevalence of MetS is about 20-25%. In oxygen transport, Iron play important role and also in respiratory chain enzymes in mitochondria its redox state is changed by TCA cycle. Cell injury and expiry is produced by inflammatory response which is the cause of oxidative stress. Ferritin stored in different organs in body such as(spleen macrophage and liver). Serum iron is reduced due to inhibiting passing from cell by Hepicidin and maintained Systemic iron homeostasis. For indicators of iron status are Iron, TIBC, and transferrin saturation. Positive association is exist of metabolic syndrome with iron and also with hyperferritinaemia in various studies In some studies, Ryu et al showed that there is no association of metabolic syndrome with serum iron.High level of saturation of transferrin in metabolic syndrome caused Hyperferritineimia normally. It is also found normal level of iron in metabolic syndrome In some studies showed that it is found that iron level is at baseline in metabolic syndrome. It was cross sectional study which was planned to elevate iron status in metabolic syndrome female patients To low serum iron in response increasing negative feedback effect which is due to enough iron stored within cell, So TIBC remains low.[22]We were registered 100 healthy women as control and 100 metabolic syndrome female patients were enrolled as test. Exclusion criteria respiratory, renal, thyroid disorders subjects, suffering from cardiovascular, liver disease. Blood pressure was taken and measured waist circumference, height and weight and calculated BMI . blood was taken at aseptic precaution and sent for Biomolecules assay of plasma glucose, TIBC, ferritin, creatinine, serum glutamate pyruvate transaminase, serum iron. Biochemistry samples were analyzed by MIcrolab 300 and kits used of Merk Pvt. SPSS used for statistical analysis. Result showed that Fasting blood glucose (145.7± 4.2) and total triglyceride (280.3 ± 31.2) were significantly higher in test subjects. Systolic and diastolic blood pressure was also higher in test subjects. in test subject. It was found that serum ferritin (204.46 ± 23.63) was significantly higher and TIBC was significantly lower. Some parameter were not significant in both groups (Serum iron and TS). Measurement of transferrin same as TIBC, in low grade inflammation related to decrease obesity and negative acute phase reactant is transferrin.[23-24] After Haber-Weiss reactions and catalyzing the Fenton, it is due to free iron which is produced after reduction of transferrin.[24]

CONCLUSION

Our study results showed that metabolic syndrome is associated with higher iron status in female patients.

Author's Contribution:

Concept & Design of Study:	Abdur Rauf Hammad
Drafting:	Abdur Rauf Hammad, Hina Ejaz
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Revisiting Critically:	Abdur Rauf Hammad
Final Approval of version:	Abdur Rauf Hammad

Conflict of Interest: The study has no conflict of interest to declare by any author.

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