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Original Research Paper

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ROLE OF HS-CRP AND IRISIN IN OBESITY AND TYPE II DIABETES MELLITUS

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ABSTRACT

Background: Overweight and type of II diabetes is emerging as important disease and the prevalence of these diseases is also increasing significantly. Studies had proposed that irisin is having a role to play in pathophysiology of obesity and other metabolic diseases. The patients who are having type 2 diabetes are found to have higher irisin levels. The study on the association of irisin and hs-CRP with obesity and type 2 diabetes is increasing.

Aim: The aim of the present study is to identify the role of irisin and HS-CRP in obesity and type II diabetes mellitus.

Material and Methods: This was a community based cross-sectional study which is conducted on the medical OPD visitors of a tertiary care centre. For conducting this study 50 participants ageing between 10-50 years were selected and both male and female participants were included in this research study. In this study 25 patients belong to the case group and 25 patients were of the control group.

Results: In the present study the mean of the HS-CRP was found to be 1.45±0.56 for case group and for the control group it was found to be 0.83±0.49. In the present study the mean irisin value for the case group was found to be 8.27±3.21 and for the control group it was found to be 7.47±2.54.

Conclusion: In the current study it was found that the hs-CRP and the irisin level of the patients with type 2 diabetes and obesity are higher as compared with the normal individuals. It can be said that both the hs-CRP and the irisin level are positively associated with the obesity and type II diabetes mellitus.

KEYWORDS : Obesity, Type II Diabetes mellitus, Irisin, hs-CRP

BACKGROUND

Overweight and type of II diabetes is emerging as important disease and the prevalence of these diseases is also increasing significantly. Overweight is an major issue in the emerging developing and the developed nations and is also having an impact on the occurrence of other diseases such as insulin resistance, vascular dysfunction, insulin resistance, hypertension and many more[1]. Also the cases of the diabetes mellitus are increasing rapidly and among them the major cases are estimated to be of type 2[2]. The prevalence of these diseases is found in both adults and children and this is also increasing the risk of other chronic diseases due to which the several researchers are being conducted for exploring the different concepts and other things associated with these diseases.

Obesity is being found to have associated with the elevation of different serum inflammatory markets and C-reactive protein is among that which suggests that it's an inflammatory disease. It was being found that the increased production of the cytokines and the acute-phase response proteins which includes high sensitivity C-reaction protein which is occurred in obesity is associated to insulin resistance, atherosclerosis and endothelial dysfunction[3]. Irisin is a 112-amino acid cleavage product of fibronectin type III domain containing protein. It is being also found that irisin is released by the muscles at the time of exercise and it increases the energy used and promotes weigh loss[4]. Studies had proposed that irisin is having a role to play in pathophysiology of obesity and other metabolic diseases. The patients who are having type 2 diabetes are found to have higher irisin levels. The present study is conducted for explaining the association between the irisin and HS-CRP with obesity and type diabetes mellitus.

AIM

The aim of the present study is to identify the role of irisin and HS-CRP in obesity and type II diabetes mellitus.

MATERIAL AND METHODS

This was a community based cross-sectional study which is conducted on the medical OPD visitors of a tertiary care hospital. For conducting this study 50 participants ageing between 10-50 years were selected and both male and female participants were included in this research study. In this study 25 patients belong to the case group and 25 patients were of the control group.

Inclusion Criteria

- Case Group: includes the obese patients also having type 2 diabetes mellitus.
- Control group: includes the participants who are not obese and are not having any other disease.

Exclusion Criteria

- Individuals with diseases obesity and diabetes mellitus were excluded from this study.

RESULTS

Parameter	Case group	Control group	P-value
Age	22.2±1.23	23.5±0.45	NS
BMI	30.5±2.65	19.95±1.56	Significant
WC	69.34±1.39	48.28±3.32	Significant
WHR	0.89±0.46	0.65±0.22	Significant
HC	79.4±4.55	69.44±2.39	Significant
SBP	129.9±4.65	109.10±4.67	Significant
DBP	97.4±6.90	65.7±8.69	Significant
TC (mg/dl)	175.4±39.85	123.3±45.09	Significant
HDL-C	30.6±5.45	28.7±2.77	NS
LCL	97.4±32.55	86.9±18.05	Significant
hs-CRP	1.45±0.56	0.83±0.49	Significant
Irisin(ng/ml)	8.27±3.21	7.47±2.54	NS
Serum Insulin	22.80(10.45-32.00)	7.29(3.67±7.67)	Significant

In the present study the mean age of the case group was found

to be 22.2±1.23 and the mean age of the control group was found to be 23.5±0.45. The mean BMI of the case group was found to be 30.5±2.65 and the mean BMI of the control group was found to be 19.95±1.56. In the present study the mean of the WC (waist circumference) was found to be 69.34±1.39 for case group and for control group the mean of the WC (waist circumference) was found to be 48.28±3.32. The mean of the HC (hip circumference) was found to be 79.4±4.55 for case group and for the control group mean of the HC (hip circumference) was found to be 69.44±2.39. The mean of the LCL (low density lipoprotein cholesterol) was found to be 97.4±32.55 for case group and for the control group it was found to be 86.9±18.05. The mean of serum insulin for the control group was found to be 22.80(10.45-32.00) and for the control group it was found to be 7.29(3.67±7.67).

In the present study the mean of the DBP (diastolic blood pressure) for case group was found to be 97.4±6.90 and the mean of the DBP (diastolic blood pressure) for control group was found to be 65.7±8.69. The mean of the SBP (systolic blood pressure) for case group was found to be 129.9±4.65 and for control group the mean of the SBP (systolic blood pressure) for case group was found to be 109.10±4.67. The mean of WHR (waist hip ratio) for case group was found to be 0.89±0.46 and for the control group the mean of the WHR (waist hip ratio) was found to be 0.65±0.22. The mean of the TC (total cholesterol) for the case group was found to be 175.4±39.85 and for the control group the mean of the TC (total cholesterol) was found to be 123.3±45.09. In the present study the mean of the high density lipoprotein cholesterol (HDL-C) for case group was found to be 30.6±5.45 and for the control group the high density lipoprotein cholesterol (HDL-C) was found to be 28.7±2.77.

In the present study the mean of the HS-CRP was found to be 1.45±0.56 for case group and for the control group it was found to be 0.83±0.49. There is a statistically significantly difference found in the mean HS-CRP among the patients case and the control group. In the present study the mean irisin value for the case group was found to be 8.27±3.21 and for the control group it was found to be 7.47±2.54 although the difference was not found to be significant.

The irisin value with for the patients with type 2 diabetes is found to be greater as compared to the normal participants of the present study. Along with this it is also found that the value of irisin was greater for the obese person as compared to the control group participants. Moreover, the hs-CRP was found to be significantly higher for the control group participants as compared with the case group participants, which shows that the hs-CRP is also greater among the patients having type 2 diabetes, and were obese.

DISCUSSION

In the present study mean age of the case group was found to be 22.2±1.23 and the mean age of the control group was found to be 23.5±0.45. On comparing this with the study of the Singh, et. al., (2019) the mean age of the case group was found to be 23.5±2.28 and for the control group the mean age was found to be 18.7±0.73. In the study of Singh, et. al., (2019)[5] the mean BMI for the case group was found to be 34.5±2.85 and for the control group 20.5±1.65. On comparing this with the current study mean BMI of the case group was found to be 30.5±2.65 and the mean BMI of the control group was found to be 19.95±1.56. In both the studies there was no significant difference between the age of the case and the control group participants but there is a significant difference between the BMI of the case and control group.

In the current study the mean of the HS-CRP was found to be 1.45±0.56 for case group and for the control group it was found to be 0.83±0.49. There is a statistically significantly difference found in the mean HS-CRP among the patients case and the control group. On comparing this with the study of Singh, et. al., (2019) it was found that there is an positive association between the hs-CRP and obesity and other indicators of obesity as well which includes weight, BMI, WC, WHR and HC. In our study also it was found that there is an positive association between hs-CRP and obesity as the hs-CRP was significantly higher in the obese participants of the study. Also in the study of Elizondo-Montemayor, et. al., (2019)[6] similar results were obtained. On the basis of this evaluation it can be said that the results of the present study is correct and the hs-CRP is found to be higher in the obese person as compared to the normal one. In the present study it is also found that the value of irisin was greater for the obese person as compared to the control group participants. Similar results were also found in the study of Elizondo-Montemayor, et. al., (2019) and Singh, et. al. (2019).

In the present study it found that there is a statistically significantly difference in the mean HS-CRP among the patients case and the control group this implies that there is also a positive association between the hs-CRP and type 2 diabetes mellitus. Similar results were also obtained in the study of Elizondo-Montemayor, et. al., (2019) and Singh, et. al. (2019). Also in the study of Zabibah, et. al., (2019)[7] it was found that the irisin level is higher for the patients having obesity. The irisin value or the patients with type 2 diabetes is found to be greater as compared to the normal participants of the present study. On comparing this with the results of the other three studies mentioned similar results were obtained that the irisin level is higher for the type 2 diabetic patients and the hs-CRP is significantly higher. Through this comparison it can be said that the results of the present study are appropriate.

CONCLUSION

In the current study it was found that the hs-CRP and the irisin level of the patients with type 2 diabetes and obesity are higher as compared with the normal individuals. It can be said that both the hs-CRP and the irisin level are positively associated with the obesity and type II diabetes mellitus.

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