(e) ISSN Online: 2321-9599

(p) ISSN Print: 2348-6805

ORIGINAL ARTICLE

Determine of hs-CRP level in centrally obese patients- A clinical study

Amit Maheshwari

Associate Professor in General Medicine, LLRM Medical College, Meerut, Uttar Pradesh, India

***ABSTRACT*:**
Background: Overweight and obesity are defined as abnormal or excessive fat accumulation that presents a risk to health. The present study was conducted to determine hs-CRP in centrally obese patients. **Materials & Methods:** The present study was conducted on 132 subjects of both genders. Blood pressure and body weight was measured. Body Mass Index (BMI) was calculated as weight in kg/height in $m^{2.}$ hs-CRP was performed with 'Dr. Turbichem hs-CRP diagnostic kit. **Results:** Out of 132 patients, 72 were males and 60 were females. The mean height in males was 5.7 feet and in females was 5.3 feet, weight was 76.2 kgs and in females was 64.5 kgs, 46 males and 21 females give positive history of smoking, 54 males and 14 females give positive history of alcoholism. The difference was significant (P< 0.05). 4 males and 2 females were normal, 10 males and 6 females were overweight, 16 males and 12 females were class I obese, 20 males and 15 females were class II obese, 22 males and 25 females were class III obese. The mean CRP level in normal subjects was 3.5, in overweight was 6.1, in class I obese was 8.4, in class II obese was 12.5 and in class III obese was 14.7. The difference was significant (P< 0.05). **Conclusion:** Authors found highest level of hs-CRP in centrally obese patients as compared to normal subjects.
Key words: BMI, CRP, Obesity

Corresponding author: Amit Maheshwari, Associate Professor in General Medicine, LLRM Medical College, Meerut, Uttar Pradesh, India

This article may be cited as: Maheshwari A. Determine of hs-CRP level in centrally obese patients- A clinical study. J Adv Med Dent Scie Res 2016;4(2):178-181.

INTRODUCTION

Overweight and obesity are defined as abnormal or excessive fat accumulation that presents a risk to health. A person with a BMI of 30 or more is generally considered obese. A person with a BMI equal to or more than 25 is considered overweight.[1]The prevalence of overweight and obesity among children and adolescents aged 5-19 has risen dramatically from just 4% in 1975 to just over 18% in 2016. The rise has occurred similarly among both boys and girls: in 2016, 18% of girls and 19% of boys were overweight.[2] In India obesity is emerging as an important health problem particularly in urban areas, paradoxically co-existing with under-nutrition. Almost 30-65% of adult urban Indians are either overweight or obese or have abdominal obesity.[3]

C-reactive protein (CRP) is an extremely sensitive marker of systemic inflammation produced mainly by the liver under the stimulation of adipocyte-derived proinflammatory cytokines. CRP has also emerged as a powerful predictor of cardiovascular diseases. One of the factors which pose a considerable health risk especially for cardiovascular diseases is obesity and overweight and elevated levels of CRP. CRP levels above 10 mg/l have been associated with increased risk of myocardial infarction, ischemic stroke and peripheral arterial disease.[4] The present study was conducted to determine hs-CRP in centrally obese patients.

MATERIALS & METHODS

The present study was conducted in department of General Medicine. It comprised of 132 subjects of both genders. The study was explained to all and written consent was obtained. Ethical clearance was taken prior to the study.

General information such as name, age, gender etc. was recorded. A complete physical examination was done in all subjects. Blood pressure and body weight was measured. Body Mass Index (BMI) was calculated as weight in kg/height in $m^{2.}$ hs-CRP was performed with 'Dr. Turbichem hs-CRP diagnostic kit. Results were tabulated and subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of subjects

Total- 132		
Gender	**Males**	**Females**
Number	72	60

Table I shows that out of 132 patients, 72 were males and 60 were females.

Graph I Distribution of subjects

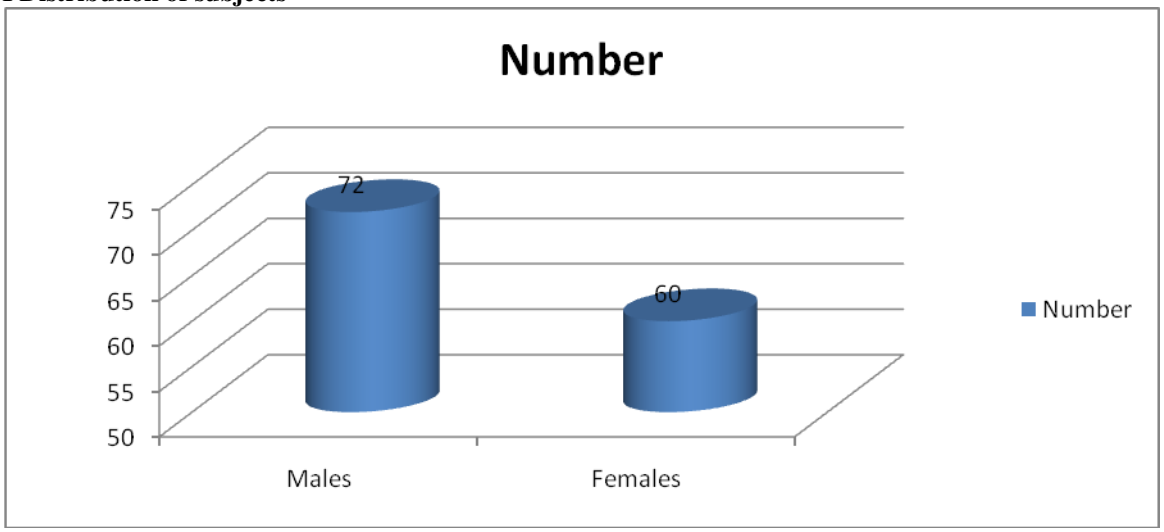


Table II Characteristics of the patients

Parameters (Mean)	Males	Females	P value
Height (Feet)	5.7	5.3	0.56
Weight (Kg)	76.2	64.5	0.05
Smoking	46	21	0.01
Alcoholism	54	14	0.001

Table II shows that mean height in males was 5.7 feet and in females was 5.3 feet, weight was 76.2 kgs and in females was 64.5 kgs, 46 males and 21 females give positive history of smoking, 54 males and 14 females give positive history of alcoholism. The difference was significant (P< 0.05).

Graph II Characteristics of the patients

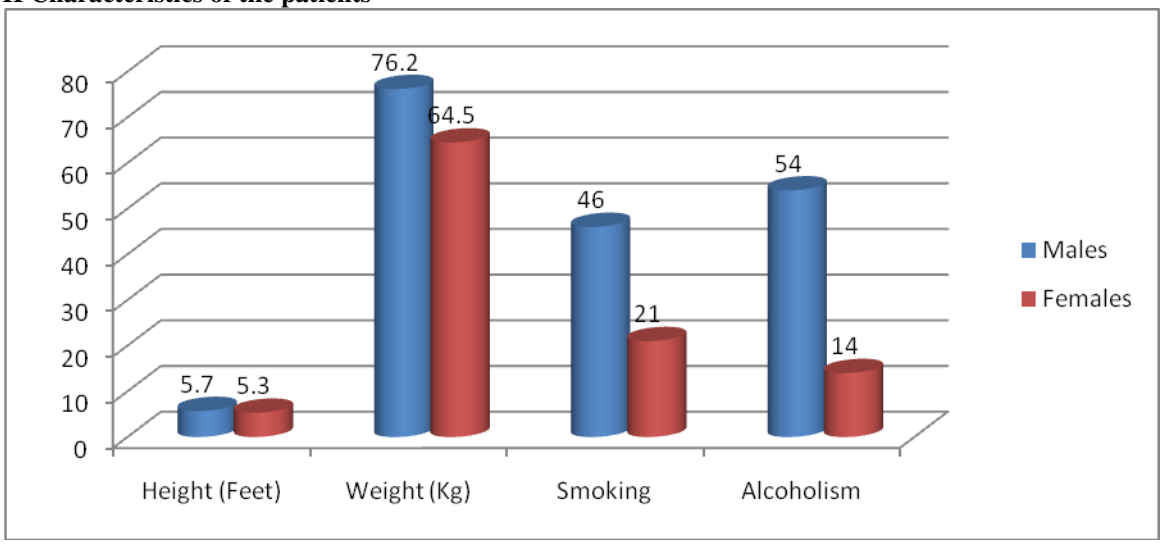
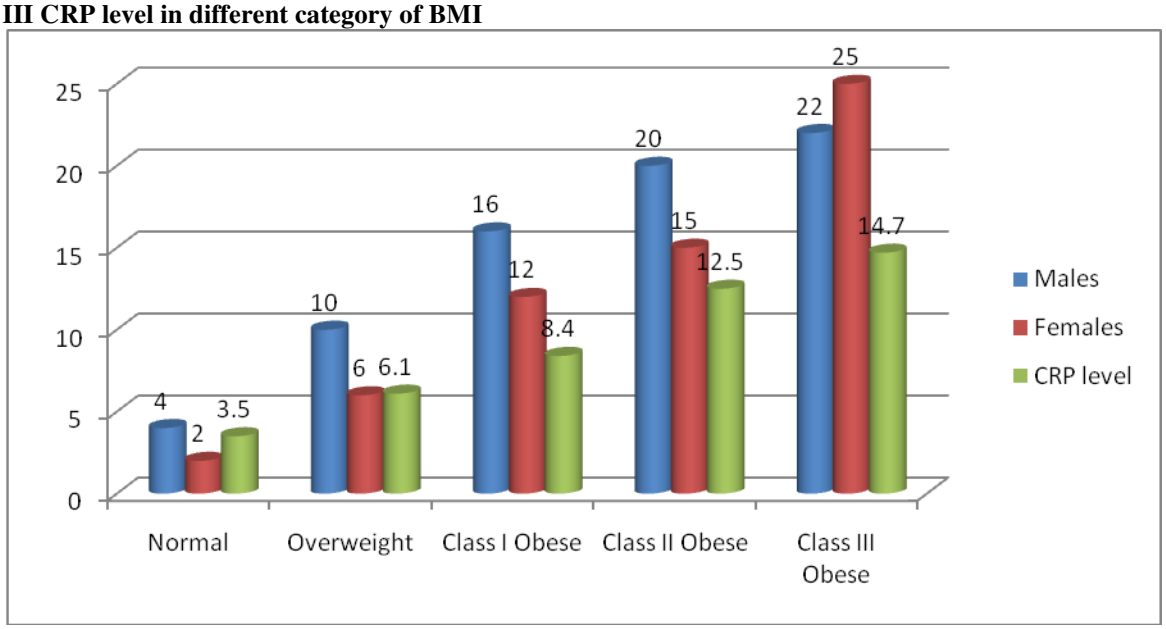


Table III CRP level in different category of BMI

BMI	Males	Females	CRP level	P value
Normal	4	2	3.5	0.04
Overweight	10	6	6.1	
Class I Obese	16	12	8.4	
Class II Obese	20	15	12.5	
Class III Obese	22	25	14.7	

Table III, graph III shows that 4 males and 2 females were normal, 10 males and 6 females were overweight, 16 males and 12 females were class I obese, 20 males and 15 females were class II obese, 22 males and 25 females were class III obese. The mean CRP level in normal subjects was 3.5, in overweight was 6.1, in class I obese was 8.4, in class II obese was 12.5 and in class III obese was 14.7. The difference was significant (P< 0.05).

Graph III CRP level in different category of BMI



DISCUSSION

Overweight and obesity are linked to more deaths worldwide than underweight. Globally there are more people who are obese than underweight this occurs in every region except parts of sub-Saharan Africa and Asia.[5]The proportion of Asian people with a high risk of type II diabetes and cardiovascular disease is substantial at BMI's lower than the existing WHO cut-off point for overweight i.e.25 kg/m.[6]

In India obesity in emerging as an important health problem particularly in urban areas, paradoxically co-existing with under-nutrition. Almost 30-65% of adult urban Indians are either overweight or obese or have abdominal obesity.[7] Overweight and obesity are rapidly increasing in countries like India. WHO Asia Pacific guidelines, define overweight, viz., body mass index (BMI) ≥23 kg/m^2 (2015) conducted a study Phase I of the ICMR-INDIAD (The Indian Council of Medical Research–India Diabetes) in a representative population of three Indian states of i.e. Tamil Nadu (TN), Maharashtra and Jharkhand; and one Union Territory (Chandigarh). It was a stratified multi-stage sampling design and individuals; ≥20 years of age were included. They revealed that the highest prevalence of both types of obesity (Generalized and Abdominal Obesity) was found in Chandigarh followed by Tamil Nadu, Maharashtra and Jharkhand, reason could be, Chandigarh has the highest per capita income among all the four regions studied.[8] The present study was conducted to determine hs-CRP in centrally obese patients.

In this study, out of 132 patients, 72 were males and 60 were females. The mean height in males was 5.7 feet and in females was 5.3 feet, weight was 76.2 kgs and in females was 64.5 kgs, 46 males and 21 females give positive history of smoking, 54 males and 14 females give positive history of alcoholism.

Lemieux et al[9] suggested that CRP concentration in the group of obese DM2 patients was 0.22 mg/dL (0.02–1.26) and did not differ significantly from that in the group of obese subjects without diabetes: 0.13 mg/dL (0.04–0.74). There were no differences between CRP concentrations in different subgroups of the DM2 group. In the subgroup with macrovascular complications, they measured 0.19 mg/dL (0.09–0.89), in the subgroup with microvascular complications 0.24 mg/dL (0.03–1.13), in the subgroup

with both macrovascular and microvascular complications 0.21 mg/dL (0.03–1.26), and in the subgroup without chronic vascular complications 0.25 mg/dL (0.02–0.94). The above CRP concentrations were not different from those observed in the obese controls, while they were significantly higher when compared to those in the normal body weight subjects.

We observed that 4 males and 2 females were normal, 10 males and 6 females were overweight, 16 males and 12 females were class I obese, 20 males and 15 females were class II obese, 22 males and 25 females were class III obese. The mean CRP level in normal subjects was 3.5, in overweight was 6.1, in class I obese was 8.4, in class II obese was 12.5 and in class III obese was 14.7. The mean CRP level in normal subjects was 3.5, in overweight was 6.1, in class I obese was 8.4, in class II obese was 12.5 and in class III obese was 14.7.

Visser et al[10] conducted a study to assess the association between elevated levels of CRP and obesity. 1432 patients, >35 years of age who had come to our hospital for the assessment of risk factors for Cardiovascular disease were included into study. The mean age for 1432 patients was 55.3 years. Males had a mean age of 57.2 years and females were 52.9 years. The levels of CRP were within the normal ranges till class I obese individuals. Among the class II and III patients there was an elevated level of CRP. Only about 4.5% of the patients with CRP levels more than 10 mg/l had normal BMI while 42.8% of the patients were under the class III obese BMI.

CONCLUSION

Authors found highest level of hs-CRP in centrally obese patients as compared to normal subjects.

REFERENCES

1. Chandalia M, Abate N, Garg A. Relationship between generalized and upper body obesity to insulin resistance in Asian Indian men. J Clin Endocrinol Metab. 1999; 84(7):2329-35.
2. Ogden CL, Carroll MD, Kit BK, et al: Prevalence of childhood & adult obesity in the United States, 2011-12. JAMA. 2014; 311(8):806-14.
3. Isomaa B, Almgren P, Tuomi T. Cardiovascular morbidity and mortality associated with the metabolic syndrome. Diabetes Care. 2001; 24(4):683-9
4. Stern M, Williams K, Gonzalez-Villalpando C. Does the metabolic syndrome improve identification of individuals at risk of type II diabetes and/or cardiovascular disease? Diabetes Care. 2004; 27(11):2676-81.
5. Vidyasagar S., Razak UK A, Prashanth CK, Varma DM, Bairy KL: Highly sensitive C-reactive protein in metabolic syndrome. Journal, Indian Academy of Clinical Medicine 2013; 14(3-4):230-4.
6. Blake GJ, Rifai N, Buring JE. Blood pressure, CRP and risk of future cardiovascular events. Circulation. 2003; 108:2993-9.
7. Gupta R, Deedwani PC, Gupta A, Rastogi S. Prevalence of metabolic syndrome in an Indian urban population. International Jr Cardiology. 2004; 97(2):257-60.
8. Koenig W, Sund M, Frohlich M, Fischer H, Lo¨wel H, Do¨ring A et al. C-reactive protein, a sensitive marker of inflammation, predicts future risk of coronary heart disease in initially healthy middle-aged men. Circulation. 1999;99:237-42.
9. Lemieux I, Pascot A, Prud'homme D, Almeras N, Bogaty P, Nadeau A et al. Elevated C-reactive protein: another component of the atherothrombotic profile of abdominal obesity. Arterioscler Thromb Vasc Biol. 2001;21:961-7.
10. Visser M, Bouter LM, McQuillan M, WeneMH, Harris TB. Elevated C-reactive protein levels in overweight and obese adults. JAMA. 1999;282(22):2131-5.