

## ORIGINAL ARTICLE

## STUDY OF HEMOGLOBIN IN VEGETARIAN AND NON-VEGETARIAN DIET IN OBESE WOMEN WITH RISK OF CARDIAC PROBLEM IN LUCKNOW CITY

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## ABSTRACT

**Introduction:** Hemoglobin level and pattern of food intake is closely associated with risk of cardiovascular diseases. The cardiovascular diseases are primarily may be due to altered lipid profile which is depend on type and pattern of food intake. Association of vegetarian and non-vegetarianisms in obese women is controversial.

**Method:** The study was conducted on vegetarianism and non-vegetarianism obese female. A total of 55 subjects were enrolled (35 cases and 20 control) for the study. The Anthropometric measurements viz. height, weight, BMI and WHR, BP, were taken and hemoglobin level (Hg %) was assessed in vegetarian and non-vegetarianism obese women.

**Results:** Our results showed that hemoglobin level (Hg %) in non-vegetarianism obese women was (12.35±1.083) high than vegetarian (9.036±1.002) obese women. The blood pressure systolic and diastolic was higher in the non-vegetarian obese women than vegetarians' obese female. There were no significant difference was found in heart rate in both groups i.e. vegetarianism and non-vegetarianism obese female. The Blood pressure systolic and diastolic was (127.63± 20.16 and 79.23±10.78) and (128.71± 23.14 and 83.26±9.23) in Vegetarian Non-vegetarian respectively.

**Discussion:** Thus Hemoglobin Level (Hg %) of non-vegetarianism were high in obese women than vegetarian. Due to Some nutrients intake, hemoglobin level was better in non-vegetarians than vegetarians.

**Key words:** Hemoglobin, Obesity, Vegetarian, Non-vegetarian

## INTRODUCTION

Obesity defined by the World Health Organization as having a Body Mass Index of 30 kg/m<sup>2</sup> or greater, is a risk factor for infertility, as well as sub fertility, or reduced fertility, in women. The reasons why obesity causes fertility problems in women are not well-understood, but some scientists speculate that obesity-related disturbances of certain metabolic hormones, including insulin and leptin, may harm a women's fertility. <sup>1</sup> Although some studies have shown associations between vegetarianism and blood pressure <sup>2, 3</sup> blood lipids <sup>4-9</sup> cancer heart disease and all-cause mortality. <sup>10,11</sup> In women, early onset of obesity favors the development of menses irregularities, chronic oligo-anovulation and infertility in the adult age. Obesity in women can also increase risk of miscarriages and impair the outcomes of assisted reproductive technologies and pregnancy, when the body mass index exceeds 30 kg/m<sup>2</sup>. The main factors implicated in the association

may be insulin excess and insulin resistance. These adverse effects of obesity are specifically evident in polycystic ovary syndrome.

Gynecologists and reproductive scientists have encountered the reproductive consequences of a society increasing in weight as a higher frequency of women diagnosed with disorders of menstruation, infertility, and diabetes mellitus in pregnancy and other significant sequel. <sup>12</sup> In addition, polycystic ovary syndrome (PCOS) is a condition characterized by hyperandrogenism and menstrual disturbances, further complicates the issue. <sup>13</sup>

**Prevalence of obesity:**

In India prevalence of obesity was 2.9% in boys and 1.5% in girls, <sup>14</sup> but in adult the prevalence of overweight/obesity was 37%. Along with males 27.27% and females 44.64%.<sup>15</sup> this is particularly evident in the USA where >50% of all women are overweight and

30% obese. In Australia, 67% of men are overweight or obese and 52% of women are overweight or obese which constitutes a marked increase over the last 20 years.<sup>16</sup>

## MATERIAL AND METHOD

Two groups of 55 young healthy non-smoking, non pregnant, married female, volunteers not using any hormonal contraception, between 25 to 40 years of age, were included in the study. The first group (Control group) consisted of twenty (20) volunteers and study group (Case Group) consist of 35 volunteers. According to body mass index (BMI) divided in two groups. The females having BMI between 20 and 25 kg/m<sup>2</sup> and they did not take any regular medication were recognize as control group and the females having BMI greater than 27 kg/m<sup>2</sup> were recognize as study group and WHR (Waist Hip Ratio) < 0.85 having for female study group. All the participants were given written informed consent to participate. The protocol was approved by the Ethics Committee of the K.G. Medical University Lucknow UP. The anthropometric parameters measurement was done by standard instrument. The blood pressure were taken through standard B.P. instrument after at least 15 minutes rest in the sitting position before the recording the B.P. values in mm hg .

### Biochemical Analysis

Blood samples were collected between 08.00 AM and 10.00 AM after an overnight fast. The volunteers were at least 15 minutes rest in the sitting position before the collection of samples from a large forearm vein. Blood sample were keep frozen at -20 °C until analyzed. Blood samples were collected for the estimation of Hemoglobin (Hg %) levels in vegetarian and non-vegetarian obese women. The hemoglobin was measured by Sahli's method with a standard component of Sahli's haemoglobinometer.

### Statistical analysis:

Results are expressed as mean  $\pm$  S.D. One-way analysis of variance (ANOVA) followed by the least significant difference (LSD) test were used to analyses the results with  $p < 0.05$  considered significant .The relationships of Hemoglobin(Hg%) between Non-vegetarian Obese Women and Vegetarian Obese Women and the anthropometric parameters were also analyzed using Pearson correlations.

## OBSERVATIONS

**Hemoglobin (Hg %) in Vegetarian Obese Women (Case group):** The hemoglobin (gm %) in vegetarian Obese Women (case group) was  $9.036 \pm 1.002$  while in control group is  $11.694 \pm 1.018$  respectively. The P-value is  $P < 0.001$ , which is statically significant.

**Hemoglobin (Hg %) in Non-vegetarian Obese Women (Case group):** The hemoglobin (gm %) in Non-vegetarian Obese Women (case group) was  $12.35 \pm 1.083$  while in control group is  $11.694 \pm 1.018$  respectively. The P-value is  $P > 0.005$  which is not statically significant.

### Blood Pressure (SBP & DBP) in vegetarian and non-vegetarian Obese Women:

The systolic blood pressure (mm hg) in Non-vegetarian Obese Women (case group) was  $128.71 \pm 23.14$  while in control group it was  $123.18 \pm 5.05$  respectively and p-value is  $P < 0.001$ .which is greater than control and borderline hypertensive. The observation shows that the diastolic pressure in cases of Non-vegetarian Obese Women (case group) was  $83.26 \pm 9.23$  mm hg while in control group were  $81.52 \pm 4.81$  mm hg respectively and p-value is  $P < 0.001$ . The heart rate (beat/minute) in omnivores Obese Women (case group) was  $69.12 \pm 11.15$  while in control group it was  $72.7 \pm 3.46$  respectively and P-value is  $P > 0.05$ , which is not statically significant.

**Table 1: Demographic and anthropometric characteristics of the subjects (vegetarian) (Values in mean  $\pm$  S.D.)**

Parameter	Case Group (Obese)	Control Group (Non Obese)	P-Value
Age(Years)	$31.62 \pm 6.03$	$29.60 \pm 6.01$	$P > 0.005$
Chest (cm)	$85.36 \pm 3.46$	$81.83 \pm 3.52$	$P < 0.001$
Abdomen(cm)	$73.47 \pm 7.26$	$70.97 \pm 5.62$	$P < 0.001$
Hips(cm)	$80.71 \pm 2.91$	$84.60 \pm 2.77$	$P < 0.001$
WHR(cm)	$0.9102 \pm 1.39$	$0.8388 \pm 2.14$	$P < 0.001$
Height(m)	$1.56 \pm 0.13$	$1.58 \pm 0.12$	$P > 0.005$
Weight(m)	$72.31 \pm 8.51$	$60.61 \pm 7.41$	$P < 0.001$
BMI(Kg/m <sup>2</sup> )	$34.32 \pm 4.74$	$25.89 \pm 3.26$	$P < 0.001$
B.P. Systolic (mm hg)	$127.63 \pm 20.16$	$123.18 \pm 5.05$	$P < 0.001$
B.P. Diastolic(mm hg)	$79.23 \pm 10.78$	$81.52 \pm 4.81$	$P < 0.001$
Heart rate	$69.12 \pm 11.15$	$72.70 \pm 3.46$	$P > 0.005$
Hemoglobin (gm %)	$9.036 \pm 1.002$	$11.694 \pm 1.018$	$P < 0.001$

**Table 2: Demographic and anthropometric characteristics of subjects (Non-vegetarian) (Values in mean  $\pm$  SD)**

Parameter	Case Group (Obese)	Control Group (Non Obese)	P-Value
Age(Years)	32.62±6.10	30.60±6.13	P>0.005
Chest(cm)	89.36±2.41	81.83±3.52	P<0.001
Abdomen(cm)	75.27±3.21	70.97±5.62	P<0.001
Hips(cm)	82.32±3.16	84.60±2.77	P<0.001
WHR(cm)	0.9143±1.39	0.8388±2.14	P<0.001
Height(m)	1.43±0.11	1.48±0.13	P>0.005
Weight(m)	73.21±7.58	60.61±7.41	P<0.001
BMI(Kg/m <sup>2</sup> )	36.21±3.25	25.89±3.26	P<0.001
B.P. Systolic (mm hg)	128.71± 23.14	123.18 ± 5.05	P<0.001
B.P. Diastolic(mm hg)	83.26±9.23	81.52±4.81	P<0.001
Heart rate	69.12±11.15	72.70±3.46	P>0.005
Hemoglobin (gm %)	12.35±1.083	11.694±1.018	P>0.005

## DISCUSSION

In this study, the mean weight, BMI, and prevalence of overweight and obesity were highest among omnivores compared with vegetarians. It has significantly lower risk of overweight or obesity in vegetarian than omnivores. Although the number of vegetarians in this population was small, the large sample size of the study allowed us to examine dietary associations between BMI and overweight or obesity among vegetarians and to detect significant effects.<sup>17</sup> Cardiovascular disease is the leading cause of mortality and a primary contributor to the burden of disease worldwide<sup>18</sup>. In this study we evaluated the hemoglobin % in vegetarian and Non-vegetarian obese female. Our results with hemoglobin in Non-vegetarian had impaired infertility over vegetarian. Observations revealed that the change in diastolic blood pressure in omnivores is higher than in age and sex matched vegetarian and control group. These findings suggest that there may be dysfunction in sympathetic reactivity also, and Alteration in parasympathetic nerve conductivity may cause undue regulatory effects on heart rate<sup>19</sup>. Therefore now it became evident that in omnivores also cause the parasympathetic impairment. Tachycardia was also observed in omnivores as compared to control during testing. It suggests that necessary change in cardiac output was compensated by increase in heart rate. This tachycardia was prominent in subjects with higher Energy or macronutrient intake subject. The exact mechanism is not being clear with this preliminary study but it is reasonable to understand that these changes may be due to cardiac dysfunction. The hemoglobin % was higher in non-vegetarian than vegetarian and Control group. It suggests that the macronutrient in omnivores is higher energy than vegetarian and control group.

## CONCLUSION

The study suggests that hemoglobin% level in vegetarian obese women is significantly less than the omnivores women. It suggests that the macronutrient in omnivores is higher energy than vegetarian and control group. The Systolic and diastolic blood pressure (mm hg) was higher in case group of Vegetarian and Non-vegetarian obese women than control group. Whereas

the Heart rates were lower in case group of Vegetarian and Non-vegetarian obese women than control group. The value of hemoglobin showed the cardiac problem with relationship in haematodynamic variation in vegetarian and non –vegetarian obese women. This study is providing the data that is help to diagnose infertility risk in obese/non obese women and also able to be indicating the incidence of infertility risk in obese women. Thus it helps to make newer strategies for infertility, cardiac, anemia management and prevention.

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