



## ***Study of Hemoglobin in Vegetarian and Non-Vegetarian diet in Obese Women with Cardiac Risk in Hapnia region, West Tripura***

Published online on 3<sup>rd</sup> August 2015@www.eternalpublication.com

**DR. GUPTA MAHENDRA KUMAR**<sup>1</sup>

**DR. SINGH ASIM KUMAR**<sup>2</sup>

**DR. BHAYAL AJAMAL SINGH**<sup>3</sup>

**MR. YADAV KEDAR PRASAD**<sup>4</sup>

1 Associate Professor, Dept. of Pathology,

2 Assistant Professor, Dept. of Microbiology

3 Associate Professor, Dept. of Pathology

Heritage Institute of Medical Sciences,

Varanasi, India

4 Tutor, Dept. of Biochemistry

Major SD Singh Medical College & Hospital,

Farukhabad, India

### **Corresponding Author:**



Dr. Mahendra Kumar Gupta

Associate Professor

Dept. of Pathology

Heritage Institute of Medical  
Sciences

Varanasi (UP, India)



+91-9918889444



mahendravn208@gmail.com

Received: 23<sup>rd</sup> July 2015; Accepted: 30<sup>th</sup> July 2015

**How to cite this article:** Gupta MK, Singh AK, Bhayal AS, et al. Study of haemoglobin in vegetarian and non-vegetarian diet in obese women with cardiac risk in Hapnia region, West Tripura. International Journal of Anatomy Physiology and Biochemistry 2015; 2(8):1-4.

### **Abstract:**

The hemoglobin (Hb) levels of blood samples from vegetarians and non-vegetarians were determined for the purpose of assessing their nutritional status and making recommendation. 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. Venous blood samples were collected from all the cases to analyze hemoglobin levels along with healthy controls. The hemoglobin (gm%) in vegetarian obese female (case group) was  $9.8 \pm 0.63$  while in control group is  $12.5 \pm 0.32$  respectively. The hemoglobin (gm%) in non-vegetarian obese female (case group) was  $12.50 \pm 0.33$  while in control group is  $13.64 \pm 0.39$  respectively. Thus hemoglobin levels of non-vegetarianism were high in obese female than vegetarian. Due to some nutrients intake, hemoglobin level was better in non-vegetarians than vegetarians.

**Keywords:** Obesity, Hemoglobin, Vegetarian, Non-vegetarian, Cardiac risk

### **Introduction:**

Obesity is a chronic metabolic disorder associated with cardiovascular disease and increased mortality and morbidity. 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> and 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 oligoanovulation 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  $30 \text{ kg/m}^2$ . 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:**

This study was conducted in the Department of Pathology, Tripura Medical College & Dr BR Ambedkar Memorial Teaching Hoapital, Hapnia West Tripura, India during the period from April 2013 to January 2014. The study protocol was approved by the Ethics committee of Tripura Medical College & Dr BR Ambedkar Memorial Teaching Hoapital, Hapnia. Randomly selected 60 patients who were categorized in two groups (30 vegetarians and 30 non-vegetarians) with an age ranged from 20-40 years along with 60 (30 vegetarians and 30 non-vegetarians) healthy controls.

#### **Biochemical Analysis:**

An overnight fast venous blood samples was collected for the estimation of hemoglobin (Hb%) levels in vegetarian and non-vegetarian obese female. The hemoglobin was estimated by Sahli's method with a standard component of Sahli's hemoglobinometer.

#### **Statistical analysis:**

All values were expressed as mean  $\pm$  S.D. We used student t-test and Pearson's correlation coefficient to find the statistical significance. A P-value  $<0.05$  was to be considered statistically significant.

#### **Results and Discussion:**

We have done the study on Hemoglobin in Vegetarian and Non Vegetarian Obese women's. Table-1 shows the Mean & SD of vegetarian and non-vegetarian obese women's age, abdominal girth, chest girth, BMI, WHR, height, weight, hip girth, heart rate, systolic & diastolic blood pressure.

The hemoglobin (gm%) in vegetarian obese women (case group) was  $9.8 \pm 0.63$  while in control group was  $12.5 \pm 0.32$  respectively. The p-value is  $< 0.0001$ , which is statically significant.

The hemoglobin (gm%) in non-vegetarian obese women (case group) was  $12.50 \pm 0.33$  while in control group was  $13.64 \pm 0.39$  respectively. The p-value is  $< 0.0001$ , which is statically significant.

In this study, Mean weight, BMI and prevalence of overweight and obesity were highest among omnivores compared with vegetarian. The risk of overweight and obesity is lower in vegetarian as compared to omnivores.

In our study we evaluated the hemoglobin % in vegetarian and non-vegetarian obese women. 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. In our study the

population was small, the large sample size of the study allowed us to examine dietary associations between BMI and overweight or obesity among vegetarian and to detect significant effect.<sup>17</sup> 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>18</sup> Therefore now it become evident that in omnivores also causes parasympathetic impairment. Tachycardia was also seen in omnivores as compared to control group. It suggests that necessary change in cardiac output was compensated by increase in heart rate. This tachycardia is prominent in subject with high energy or macronutrient intake. Exact mechanism is not clear but it is understood that it is due to cardiac dysfunction. The hemoglobin percentage was higher in non-vegetarian as compare to vegetarian and control group. It suggests that the macronutrient in omnivores is higher energy than vegetarian and control group. Cardiovascular disease is the leading cause of mortality and major contributor of the burden of disease in world wide.<sup>19</sup>

**Table No. 1 Demographic and anthropometric characteristics of the subjects (Vegetarian & non- Vegetarian).Values in mean ± S.D.**

Parameters	Vegetarian		Non-vegetarian	
	Control gr. (non-obese)	Case gr. (obese)	Control gr. (non-obese)	Case gr. (obese)
Age (years)	29.60 ±3.50	31.77 ±4.64	31.30 ±4.60	31.33 ±4.33
Abdomen girth (cm)	70.60 ±1.50	72.73 ±1.68	67.90 ±1.58	74.70 ±2.22
Chest girth (cm)	79.23 ±1.10	84.87 ±1.68	77.73 ±2.66	85.95 ±1.87
BMI (kg/m <sup>2</sup> )	23.31 ±0.50	31.42 ±1.20	24.65 ±0.81	35.93 ±2.54
WHR (cm)	0.83 ±2.14	0.91 ±1.39	0.83 ±2.14	0.91 ±1.39
Height (m)	1.61 ±0.03	1.61 ±0.04	1.52 ±0.03	1.51 ±0.04
Weight (Kg)	60.17 ±2.02	81.43 ±2.30	57.20 ±2.85	81.43 ±2.30
Hips (cm)	85.10 ±1.45	81.13 ±1.41	79.03 ±2.11	76.50 ±2.76

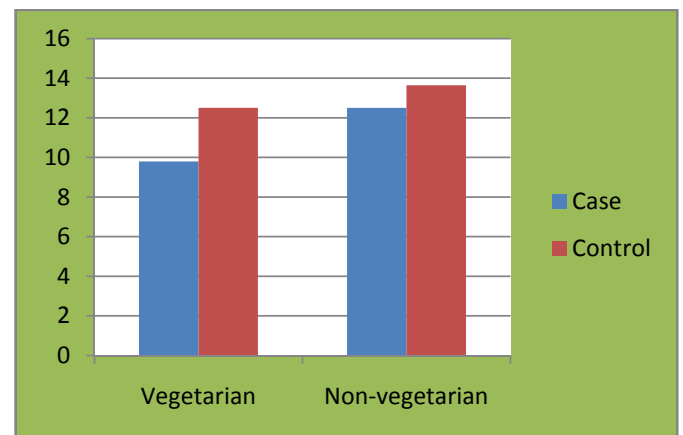
<b>Heart rate (beats/min)</b>	73.17 ±4.99	70.47 ±4.91	72.43 ±4.90	69.4 ±3.60
<b>Systolic (mmHg)</b>	122.53 ±3.01	126.47 ±5.35	123.67 ±6.08	129.4 ±4.07
<b>Diastolic (mmHg)</b>	81.4 ±3.32	84.27 ±3.27	82.27 ±4.16	84.33 ±3.19

**Table No. 2 Comparison of Haemoglobin (Hb%) between case gr. (obese) and control gr. (non-obese).**

Parameters	Vegetarian group		P-Value
	Control (non-obese) n=30	Case (obese)n=30	
<b>Haemoglobin (Hb%)</b>	12.5 ± 0.32	9.8 ± 0.63	<0.0001
<b>Non-vegetarian group</b>			
<b>Haemoglobin (Hb%)</b>	13.64 ± 0.39	12.50 ± 0.33	<0.0001

\*Statistically significant p-value is < 0.0001

**Chart No. 1 Shows comparison of Haemoglobin (Hb%) between case gr. (obese) and control gr. (non-obese).**



**Conclusion:**

These findings suggest that hemoglobin level in vegetarian obese women is significantly less than the omnivore’s (non-vegetarian) female. It suggests that the macronutrient in omnivores is higher energy than vegetarian and control group. The systolic and diastolic blood pressure 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 risk with relationship in haematodynamic variation in vegetarian and non-vegetarian obese women.

## References:

1. Seidell JC. Obesity. A growing problem. *Acta Paediatrica Suppl* 1999;88:46-50.
2. Rouse II, Armstrong BK, Beilin LJ. The relationship of blood pressure to diet and lifestyle in two religious populations. *J Hypertens* 1983;1:65-71.
3. Appleby PN, Davey GK, Key TJ. Hypertension and blood pressure among meat eaters, fish eaters, vegetarians and vegans. *EPIC-Oxford Public Health Nutr* 2002;5:645-54.
4. Reddy S, Sanders TA. Lipoprotein risk factors in vegetarian women of Indian descent are unrelated to dietary intake. *Atherosclerosis* 1992;95:223-9.
5. Krajcovicova-Kudlackova M, Simoncic R, Bederova A et al. Selected parameters of lipid metabolism in young vegetarians. *Ann Nutr Metab* 1994;38:331-5.
6. Toohey ML, Harris MA, DeWitt W et al. Cardiovascular disease risk factors are lower in African- American vegans compared to lacto-ovo-vegetarians. *J Am Coll Nutr* 1998;17:425-34.
7. Key TJ, Fraser GE, Thorogood M et al. Mortality in vegetarians and non-vegetarians: a collaborative analysis of 8300 deaths among 76,000 men and women in five prospective studies. *Public Health Nutr* 1998;1:33-41.
8. Appleby PN, Thorogood M, Mann JI et al. The Oxford Vegetarian Study: an overview. *Am J Clin Nutr* 1999;70(suppl):525-31.
9. Lin CL, Fang TC, Gueng MK. Vascular dilatory functions of ovo-lacto vegetarians compared with omnivores. *Atherosclerosis* 2001;158:247-51.
10. Fraser GE. Associations between diet and cancer, ischemic heart disease, and all cause mortality in non-Hispanic white California Seventh-day Adventists. *Am J Clin Nutr* 1999;70(suppl):532-8.
11. Key TJ, Fraser GE, Thorogood M et al. Mortality in vegetarians and non-vegetarians: detailed findings from a collaborative analysis of 5 prospective studies. *Am J Clin Nutr* 1999;70(suppl):516-24.
12. Sharpe RM, Franks S. Environment, lifestyle and infertility. Dan inter-generational issue. *Nature Cell Biol* 2002;4(Suppl):33-40.
13. Norman RJ, Davies MJ, Lord J et al. The role of Lifestyle modification in polycystic ovary syndrome. *Trends Endocrinol Metab* 2002;13:251-57.
14. Goyal RK, Shah VN, Saboo BD et al. Prevalance of overweight and obesity in Indian adolescent school going children: its relationship with socioeconomic status and associated lifestyle factors. *J Assoc Physicians India* 2010;58:151-8.
15. Uthakalla VK, Kishore KJ, Jena SK. Prevalence Study of Overweight/Obesity among adults (20-60 yrs) of Urban Field Practice Area of Osmania Medical College, Hyderabad. *Indian Journal of Public Health Research & Development* 2012;3(3):250-3.
16. Australian Institute of Health and Welfare, 2002.
17. Dwyer JT. Health aspects of vegetarian diets. *Am J Clin Nutr* 1988;48:712-38.
18. Lopez AD, Mathers CD, Ezzati M et al. Global and regional burden of disease and risk factors, systematic analysis of population health data. *Lancet* 2006;367:1747-57.
19. Zaza A, Lombardi F. Autonomic Indexes based on the analysis of heart rate variability: a view from the sinus node. *Cardiovasc Res* 2001;50:434-42.