

“Evaluation of Hemoglobin Level in Vegetarian and Non-Vegetarian Diet in Obese Women With Cardiac Risk in Rural Area in Varanasi”



Medical Science

KEYWORDS : Obesity, Hemoglobin, Vegetarian and Non-vegetarian.

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ABSTRACT

The 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-vegetarian in obese women is controversial. 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 ± 0.63 while in control group is 12.5 ± 0.32 respectively. The hemoglobin (gm%) in non-vegetarian obese female (case group) was 12.50 ± 0.33 while in control group is 13.64 ± 0.39 respectively. Thus hemoglobin level of non-vegetarianism were high in obese women than vegetarian. Due to some nutrients intake, hemoglobin level was better in non-vegetarians than vegetarians.

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^2 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.^[1] Although some studies have shown associations between vegetarianism and blood pressure^[2,3] blood lipids^[4-9] cancer heart disease and all-cause mortality.^[10-11] 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 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.^[12] In addition, polycystic ovary syndrome (PCOS) is a condition characterized by hyperandrogenism and menstrual disturbances, further complicates the issue.^[13]

Prevalence of Obesity:

In India prevalence of obesity was 2.9% in boys and 1.5% in girls,^[14] but in adult the prevalence of overweight/obesity was 37%. Along with males 27.27% and females 44.64%.^[15] 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.^[16]

MATERIAL AND METHOD:

This study was conducted in the Department of physiology, Her-

itage Institute of Medical Sciences, Varanasi, India during the period from February 2015 to June 2015. Randomly selected 60 patients which were categorized in two groups (30 vegetarian and 30 non-vegetarian) with an age ranged from 25-40 years along with 60 (30 vegetarian and 30 non-vegetarian) healthy controls.

Biochemical Analysis:

An overnight fast venous blood samples were 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:

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 (Hb%) between Non-Vegetarian Obese Women and Vegetarian Obese Women and the anthropometric parameters were also analyzed using pearson correlations.

RESULTS AND DISCUSSION:

We studied the study on Hemoglobin in Vegetarian and Non Vegetarian Obese Womens. Table-1 shows the Mean & S.D. of vegetarian and non-vegetarian obese womens age, abdomen, chest, BMI, WHR, height, weight, hips, heart rate, systolic & diastolic blood pressure.

The hemoglobin (gm%) in vegetarian obese women (case group) was 9.8 ± 0.63 while in control group is 12.5 ± 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 ± 0.33 while in control group is 13.64 ± 0.39 respectively. The p-value is < 0.0001 , which is statistically significant.

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

Parameters	Vegetarian		Non-vegetarian	
	Control gr. (non-obese)	Case gr.(obese)	Control gr. (non-obese)	Case gr.(obese)
Age (years)	29.60 \pm 3.50	31.77 \pm 4.64	31.30 \pm 4.60	31.33 \pm 4.33
Abdomen (cm)	70.60 \pm 1.50	72.73 \pm 1.68	67.90 \pm 1.58	74.70 \pm 2.22

Parameters	Vegetarian		Non-vegetarian	
	Control gr. (non-obese)	Case gr.(obese)	Control gr. (non-obese)	Case gr.(obese)
Chest (cm)	79.23±1.10	84.87±1.68	77.73±2.66	85.95±1.87
BMI (kg/m ²)	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 (m)	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
Heart rate	73.17±4.99	70.47±4.91	72.43±4.90	69.4±3.60
Systolic(mmHg)	122.53±3.01	126.47±5.35	123.67±6.08	129.4±4.07
Diastolic(mmHg)	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	
	mean±S.D.	mean±S.D.	
Haemoglobin (Hb%)	12.5 ± 0.32	9.8 ± 0.63	<0.0001
	Non-vegetarian group		
Haemoglobin (Hb%)	13.64 ± 0.39	12.50 ± 0.33	<0.0001

*Statistically significant p-value is < 0.0001

Chart-1: shows comparison of Haemoglobin (Hb%) between case gr. (obese) and control gr. (non-obese).

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 this 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.^[17] 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.^[18] 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 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 % 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.^[19]

CONCLUSION:

Our findings suggests that the hemoglobin level in vegetarian obese women is significantly less than the omnivores 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. 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.

REFERENCE

Seidell JC. Obesity. A growing problem. *Acta Paediatrica Suppl* 1999; 88:46 -50 | 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. | Appleby PN, Davey GK, Key TJ. Hypertension and blood pressure among meat eaters, fish eaters, vegetarians and vegans in EPIC-Oxford Public Health Nutr 2002; 5:645-54. | Reddy S, Sanders TA. Lipoprotein risk factors in vegetarian women of Indian descent are unrelated to dietary intake. *Atherosclerosis* 1992; 95: 223-9. | Krajcovicova-Kudlackova M, Simoncic R, Bederova A, Ondreicka R, Kivanova J. Selected parameters of lipid metabolism in young vegetarians. *Ann Nutr Metab* 1994; 38:331-5. | Toohey ML, Harris MA, DeWitt W, Foster G, Schmidt WD, Melby CL. Cardiovascular disease risk factors are lower in African- American vegans compared to lacto-ovo-vegetarians. *JAmColl Nutr* 1998; 17:425-34. | 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. | Appleby PN, Thorogood M, Mann JI, Key TJ. The Oxford Vegetarian Study: an overview. *Am J Clin Nutr* 1999; 70(suppl):525S-31S. | Lin CL, Fang TC, Gueng MK. Vascular dilatory functions of ovolactovegetarians compared with omnivores. *Atherosclerosis* 2001; 158: 247-51. | 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):532S-8S. | 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):516S-24S. | Sharpe RM and Franks S (2002) Environment, Lifestyle and infertility Dan inter-generational issue. *Nature Cell Biol* 4(Suppl), s33±40. | Norman RJ, Davies MJ, Lord J and Moran LJ (2002). The role of Lifestyle modification in polycystic ovary syndrome. *Trends Endocrinol Metab* 13:251±257. | Goyal RK, Shah VN, Saboo BD, Phatak SR, Shah NN, Gohel MC, Raval PB, Patel SS. Prevalence of overweight and obesity in Indian adolescent school going children: its relationship with socioeconomic status and associated lifestyle factors. *J Assoc Physicians India*, 2010 Mar; 58:151-8. | Uthakalla VijayaKumar, Kumar KJ. Kishore, Jena S.K, Matta Priyadarshini, Thomas Vimala, suryaprabha. Prevalence Study of Overweight/Obesity among Adults (20-60yrs) of Urban Field Practice Area of Osmania Medical College, Hyderabad, *Indian Journal of Public Health Research & Development*, 2012; 3:3,250-253. | Australian Institute of Health and Welfare, 2002. | Dwyer JT. Health aspects of vegetarian diets. *Am J Clin Nutr* 1988; 48: 712-38. | Lopez AD, Mathers CD, Ezzati M, Jamison DT, Murray CJ. Global and regional burden of disease and risk factors, systematic analysis of population health data. *Lancet* 2006; 367:1747-757. | 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. |