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Study of the Anthropometric, Biochemical and Hematological Parameters among the Hindu Brahmin Priests of Western Maharashtra, India.

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ABSTRACT

The hindu brahmin priests are daily involve in rituals of saying rhyms and exposed to fire fumes, consume food rich in fat and carbohydrate and their lifestyle is also sedentary. Aim of this project was to study the biochemical, hematological and anthropometry parameters of the priests of Western Maharashtra, India. A total of 86 priests from Western Maharashtra, India were included. Lipid profile such as serum triglycerides ($p<0.05$, 26 %), serum cholesterol ($p<0.05$, 11.36 %) were significantly increased and there was no statistical significant alteration in serum HDL (4.65%) level of study group as compared to control group. Alanine tranaminase ($p<0.001$, 48.33%) and aspartate tranaminase ($p<0.05$, 18.21%) were statistically significantly increased of study group as compared to control group. This study shows the impact of sedentary lifestyle along with unhealthy food on the ethnic group of priest community and needs special attention as they are predisposed to alteration in the lipids and are predisposed to coronary events.

Keywords: Hindu Priests, Anthropometric, Biochemical and Hematological Parameters.

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INTRODUCTION

The Hindu priest community consists of group of people who do rituals of saying rhyms (pooja) at times before the fire and they are exposed to the fumes and have to sit for 5 to 6 hours at a stretch together. This type of sedentary lifestyle is since many years from childhood to adult. After completing the rituals of rhymes they are served food rich in fats (Ghee) and carbohydrate. Excess consumption of ghee has been contributing to an increased risk of cardiovascular disease since it contains a high percentage of saturated fatty acids, leading to increased synthesis of cholesterol. The American Heart Association recommends limiting the consumption of saturated fats to less than 7% of energy to reduce the risk of cardiovascular disease [1].

So this ritual of sitting daily at hours together followed by consumption of such type of food may cause alterations in the levels of blood lipids and lead to obesity and cardiovascular disease.

The coincidence of obesity, insulin resistance, hypertension and dyslipidemia is commonly referred to as the 'metabolic syndrome'. High cholesterol diet is regarded as an important factor in the development of cardiac diseases as it leads to the development of hyperlipidemia, atherosclerosis and ischemic heart disease [2,3].

The exposure to the fumes may lead to increased levels of lipid peroxidation, a free radical-mediated reaction, which has been implicated in various disorders such as post-ischemic conditions, inflammation, head injury, stroke, carcinogenesis, cardiovascular disease, and aging [4].

Several religions such as Hinduism, Buddhism, Judaism, Islam, have been studied regarding their relation to health [5] as far our knowledge goes none of the studies has been carried out in this particular cohort of population of Brahmin priests till today. Therefore, the main aim of this project was to study the anthropometry, biochemical and hematological parameters to find out if there is coexisting metabolic syndrome of the priests of Western Maharashtra, India. To achieve this aim we have estimated the biochemical parameters such as serum total cholesterol, triglyceride, HDL, fasting and post pandrial blood sugar level, blood urea, serum creatinine, alanine and aspartate transminase and also we have measured hematological parameters such as Haemoglobin (Hb), Hematocrit (HCT), Mean Corpuscular Volume (MCV), Mean Corpuscular Haemoglobin (MCH), Mean Corpuscular Haemoglobin Concentration (MCHC), Red Blood Cell (RBC), White Blood Cell (WBC), Platelets (PLT) of the hindu brahmins religious priests and compare them with same age and gender matched control group. The anthropometric parameters like height, weight, BMI, abdomen and neck circumference were studied of study and control groups subjects.

MATERIAL AND METHODS

For this study total of 86 subjects from Western Maharashtra, India were included, 43 were apparently healthy hindu brahmins male priests, who were doing activities of daily rituals like sitting in front of fire for religious offering and reading religious rhymes for 5 to 6 hours per day are included in the study group and 43 subjects of same age and sex religion and of Brahmin caste but were not doing any sedentary work other than being priest, who were doing all the routine activities were considered as control group. In this study the data was collected at Krishna Institute of Medical Sciences University; Karad from October to December 2013 and it was analysed after that from Jan 2014 to March 2014. Ethics clearance of this study was obtained from the institutional ethics committee. The main aim of this study was explained and informed consent was obtained from the study and control group subjects. For this study healthy religious brahmins priests of the age group 16 to 77 years without any habits like smoking, tobacco chewing and consuming non vegetarian food from Kolhapur, (Maharashtra), India, were included and those who were on treatment for minor illness and existing cardiovascular complications or any other diseases were excluded from this study.
Ten ml blood was withdrawn from study and control group subjects and 6 ml was transferred in plain bulb to obtain the serum for the estimation of lipid profile (Total Cholesterol, Triglyceride, HDL), blood urea, serum creatinine, aspartate transaminase and alanine tranaminase level, and two ml blood was transferred to flouride bulb for estimation of fasting and post pyrandial blood sugar level, remaining two ml blood was collected in CBC bulb for hematological parameter assay.

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All these biochemical parameters were estimated by using standard kit method on fully automatic biochemistry analyzer Transasia EM 360. Hematological parameters i. e Hb, MCV, MCH, MCHC, Platelets, TLC, DLC were estimated by using Beckman Coulter automatic analyzer.

Also all the physiological and anthropometric parameters were measured by standard method. Weight was recorded in Kg. The waist circumference measurement was done in standing posture at umbilicus level using flexible measuring tape. Blood pressure was measured in mm / Hg using sphygmomanometer. Neck circumference was measured in the midway of the neck, between mid cervical spine and mid anterior neck. In men with a laryngeal prominence (Adam's apple), it was measured just below the prominence. All circumferences were taken with the subjects standing up right, with the face directed straight and shoulders relaxed. Body Mass Index (BMI) was calculated using the formula weight in kg / height in meter square. Statistical Analysis was done using instant graph pad and calculated mean and standard deviation of each parameter and the student's t-test was applied for comparison of mean values and χ^2 statistics was used for qualitative data.

RESULTS

Table 1: Mean ± SD of Anthropometrical Parameters of Control and Study Groups

Anthropometrical Parameters	Control Group (N=43)	Study Group (N=43)
Age (Years)	50.60 ± 15.40 (16-73)	46.60 ± 14.70 ^{NS} (23-77)
Weight (Kg)	66.40 ± 10.10 (49-88)	64.31 ± 9.87 ^{NS} (47-93)
Height (Ft)	5.55 ± 0.25 (5.08-5.97)	5.54 ± 0.26 ^{NS} (4.98-6.06)
BMI (Kg/m^2)	23.31 ± 3.95 (16.96-33.37)	22.56 ± 3.22 ^{NS} (13.73-40.25)
Abdomen (cm)	89.80 ± 10.10 (60-110)	87.98 ± 9.29 ^{NS} (63-113)
Neck (cm)	36.54 ± 3.01 (30-44)	36.31 ± 3.23 ^{NS} (32-45)

BMI - Body Mass Index, ^{NS} Non Significant, Bracket shows the minimum and maximum level

Table 2, Mean ± SD of Biochemical Parameters of Control and Study Groups

Sr. No.	Biochemical Parameters	Control Group	Study Group
1	Fasting – BSL (mg/dl)	125 ± 61.10 (83-367)	132.40 ± 57.10 ^{NS} (83-329)
2	PP – BSL (mg/dl)	159.40 ± 92.70 (91-560)	147.60 ± 98.60 ^{NS} (121-482)
3	ALT (Unit / L)	33.10 ± 25.20 (17-79)	49.10 ± 12.30 *** (14-114)
4	AST (Unit / L)	27.50 ± 9.89 (17-79)	32.51 ± 11.20 * (20-70)
5	Blood Urea (mg/dl)	24.81 ± 5.71 (11-53)	23.63 ± 8.92 ^{NS} (13-43)
6	Serum Creatinine (mg/dl)	1.16 ± 0.13 (0.8-1.6)	1.04 ± 0.20 *** (0.7-1.3)
7	Serum Triglyceride (mg/dl)	147.6 ± 98.04 (55-414)	186.1 ± 74.65 * (69-492)
8	Serum Cholesterol (mg/dl)	173.30 ± 35.90 (101-296)	193.00 ± 38.90 * (113-284)
9	Serum HDL (mg/dl)	39.98 ± 8.69 (26-51)	41.84 ± 8.33 ^{NS} (23-66)

PP- BSL- Post Prandial Blood Sugar Level, ALT- Alanine Transaminase, AST- Aspartate Transaminase, HDL – High Density Lipoproteins, *** $p< 0.001$, * $p <0.05$, ^{NS} Non Significant
Bracket shows the minimum and maximum level

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The mean measurement and comparision of all anthropometrical parameters like age, weight, height, BMI, abdominal and neck circumference of control group as compared with the study group were non-significant.

The comparison of the biochemical parameters like F BSL, PP BSL, HDL were non-significant as compared to AST, TG, Cholesterol which were significant(P< 0.05) whereas ALT, Creatinine were highly significant (P< 0.001).

Similarly, the comparison between Haematological parameters like Hb, HCT, MCHC, RBC, WBC, Platelets were non-significant, whereas MCH was significant (P<0.05) where as MCV was highly significant (P< 0.001).

Figure 1 shows the percentage change of the biochemical parameters of the study group with respect to control, out of which ALT and Triglyceride was on higher side.

Figure 2 shows the percentage change of the haematological parameters of the study group with respect to control, out of which MCH and MCV was on the higher side.

Table 3: Mean ± SD of Hematological Parameters of Control and Study Groups

Sr. No.	Hematological Parameters	Control Group	Study Group
1	Hb (gm/dl)	14.34 ± 1.39 (9.3-17.4)	14.48 ± 1.40 ^{NS} (10.5-17)
2	HCT (%)	44.04 ± 4.18 (29.1-53.2)	43.14 ± 5.87 ^{NS} (14.6-52.7)
3	MCV (fL)	88.56 ± 8.94 (75-122.3)	83.13 ± 9.73** (39.8-104.1)
4	MCH (pg)	29.01 ± 2.66 (24-39.1)	27.83 ± 2.58* (20.7-35.1)
5	MCHC (gm/dl)	32.81 ± 1.36 (28.9-35.2)	33.11 ± 1.43 ^{NS} (29.9-33.1)
6	RBC (x 10^6/µL)	5.02 ± 0.64 (2.38-6.2)	5.22 ± 0.45 ^{NS} (3.45-6.37)
7	WBC (x 10^9/L)	7.45 ± 1.64 (4.25-11.75)	7.59 ± 1.60 ^{NS} (5.15-11.35)
8	PLT (/µL)	263.60 ± 67.90 (88-408)	270.10 ± 51.50 ^{NS} (165-374)

Hb- Haemoglobin, HCT – Hematocrit, MCV- Mean Corpuscular Volume, MCH- Mean Corpuscular Haemoglobin, MCHC- Mean Corpuscular Haemoglobin Concentration, RBC- Red Blood Cell, WBC – White Blood Cell, PLT- Platelets

** p< 0.01, * p <0.05, ^{NS} Non Significant

Bracket shows the minimum and maximum level [14,15].

Figure1. Percentage Change of Biochemical Parameters of Study Group with Respect to Control

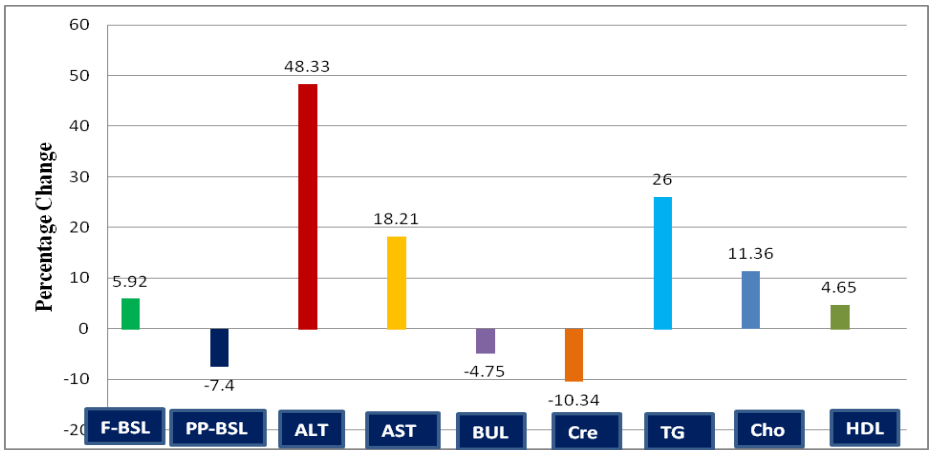

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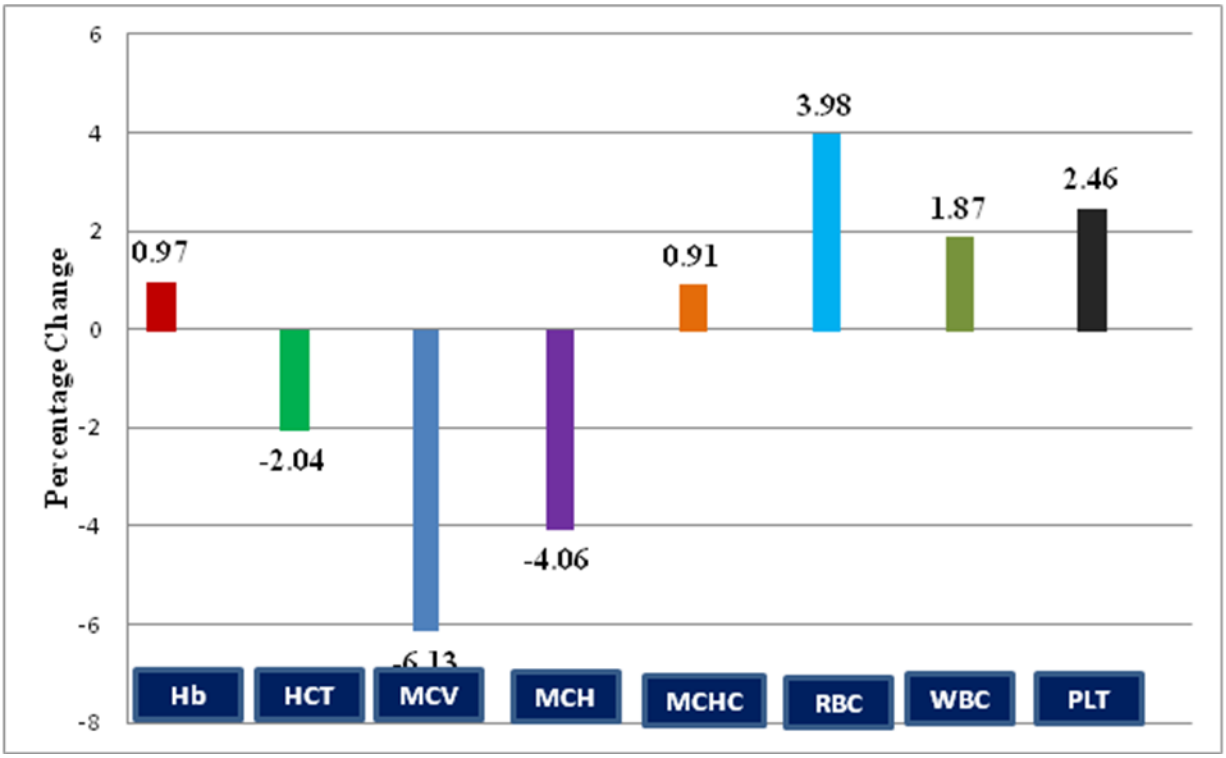
Figure 2: Percentage Change of Haematological Parameters of Study Group with Respect to Control



DISCUSSION

The mean values of anthropometrical parameters like weight, height, body mass index, abdominal and neck circumference of study group were non- significant as compared to control, which indicates similar body contour of priests in study and control group.

Visceral or abdominal obesity has been recently recognized as an important player in the pathogenesis of both glucose intolerance and atherosclerosis. Historically, obesity has been characterized by calculation of BMI. However large studies have suggested that waist circumference and / or waist hip ratio may provide a better estimate of both the degree of abdominal obesity and risk of cardiovascular diseases. Asians with BMI less than 25 kg/m2 is ideal. Obesity cut off in Asians has been revised from BMI more than 30 kg/m^2 to 25 kg/m^2. A more appropriate estimate of visceral fat and insulin resistance in south asians may be the measurement of waist circumference [6]. Here both the groups had a higher BMI more than the normal range. Measurements of the hypertension showed different results, out of 43 cases 15 had a BP more than 130/85 mm Hg where as 14 controls had more BP than normal values, this can be due to the stress free atmosphere of the study group of the priests where they have to sit and chant the rhymes which does not increase the level of stress leading to normal BP.

Lipid profile such as serum triglycerides ($p<0.05$, 26 %), serum cholesterol ($p<0.05$, 11.36 %) were significantly increased and there was no statistical significant alteration in serum HDL (4.65%) level of study group as compared to control group, which shows that the priests of study group consuming large amount of vanaspati ghee (vegetable ghee), which contains 40% trans fatty acids and having sedentary life style.

The triglyceride level is one of the lipid profile parameters that can aid prediction of Coronary Heart Disease (CHD) risk. An elevated serum triglyceride level is strongly associated with an increased risk of CHD [7-9]. Raised triglyceride levels can be present in individuals at risk for CHD even when the total cholesterol is within normal range. The role of triglyceride in CHD pathogenesis is thought to involve several direct and indirect mechanisms, such as effects on the metabolism of other lipoproteins, transport proteins, enzymes, and on coagulation and endothelial dysfunction [10]. Hypertriglyceridemia is frequently associated with other

lipid abnormalities and the metabolic syndrome, which are linked to coronary artery disease [11-13]. Elevated triglyceride level in priests may be partly caused by eating more sugar.

An elevated serum triglyceride (TG) level at baseline is commonly accompanied by high LDL-C and low HDL-C and this combination (i. e the atherogenic dyslipedemic triad) is associated with the highest cardiovascular disease (CVD) risk. Thus TG levels appear to provide unique information as a biomarker of risk, especially when combined with low HDL-C and elevated LDL-C. The table illustrated above shows the minimum and maximum levels of Biochemical and Hematological Parameters [14,15]. In our study group subjects had all the features of the metabolic syndrome such as increased level of triglyceride and total cholesterol. [16] Subjects with the metabolic syndrome face a 2-fold greater risk of all-cause mortality and a 2- to 3-fold increased risk of cardiovascular mortality compared with those without the syndrome [17].

Alanine tranaminase ($p<0.001$, 48.33%) and aspartate tranaminase ($p<0.05$, 18.21%) were statistically significantly increased of study group as compared to control group may be due to the alterations of lipid profile level and similar studies were reported in literature [18].

Fasting blood glucose (5.92%) and post pyrandial blood glucose levels (-7.40%) were not significantly altered in study group as compared to control, but these levels are on the higher side, may be due sedentary life style and physical in activities.

Kidney function parameters such as blood urea, serum creatinine were not significantly altered in study group as compared to control indicating the normal functioning of the kidney.

Hematological parameters like hemoglobin (0.97%), Mean Corpuscular Haemoglobin Concentration (0.91%), Red Blood Cell (3.98 %), White Blood Cell (1.87%), Platelets (2.46 %) were increased and Hematocrit (-2.04%), Mean Corpuscular Volume ($p<0.01$, -6.13%), Mean Corpuscular Haemoglobin ($p<0.05$,-4.06%) were decreased in study group as compared to control, However the statistically significant decreased levels were observed only in MCV and MCH, but there were no statistically significant alterations observed in remaining haematological parameters in study group priests. In our study the level of MCV and MCH were statistically significant decreased but the Hb and RBC concentration were within the normal range, which indicates normal haemopoietic system. Though the values of biochemical and haematological parameters of study group are not within the normal range.

The limitation of this study is mainly less number of sample sizes due to less availability of the hindu brahmin priests. Therefore, in future, we plan to undertake further study with larger sample size and adding various other biochemical parameters.

CONCLUSION

Thus our study attempts to provide an understanding of the impact of sedentary lifestyle along with unhealthy food on the ethnic group of priest community, it also supports our hypothesis by highlighting the fact that this group needs special attention as they are predisposed to alteration in the lipids and are predisposed to coronary events.

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