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Atherogenic risk in premature canities among college students India

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Abstract---Introduction: Appearance of gray hair before the age of 25 years in Asian population considered as premature canities. The degree of hair graying is a risk factor for coronary artery disease. Studies says that visible ageing sign reflects the poor cardiovascular health status irrespective of the chronological ageing. However datas on the role of premature canities is not well established and datas were sparse. Hence the aim of the present study is (i) to evaluate the atherogenic risk in premature canities and (ii) to understand the inter relationship of premature canities with history of diabetes and hypertension Materials and methods: This cross-sectional study was conducted from June 2021 to October 2021 among the college students studying at ACS Medical College & Hospital, Chennai, India. Subjects with vitiligo, premature graying syndrome, Autoimmune thyroid disease or under treatment for any clinical conditions were excluded from this study. The Inclusion criteria were healthy volunteers of aged < 25 years. The study was approved by the institutional ethics committee. After obtaining informed consent demographic parameters were collected in preformed proforma.

Fasting blood samples were collected in plain tubes and analyzed for lipid profile, total protein, albumin, thyroid profile. Atherogenic Index of plasma (AIP) calculated. Statistical analysis: All the data's are expressed as mean ± standard deviation (SD). Significant difference between the groups were determined using the Student's t-test. Statistical significance was set at P <0.05. All statistical analyses were performed using SPSS software 20. Results: A total of 122 volunteers were took part in this present study among them 61 had premature canities called as cases and 61 were in the control group without premature canities. The mean and standard deviation (SD) of the age of cases and controls were similar (21.4 ± 1.7 versus 21.1 ± 1.4) respectively. The HDL levels in the cases and controls were (42.13 ± 7.1 versus 47± 7.4) (P<0.00) which was statistically significant. The Atherogenic Index of Plasma (AIP) in cases and controls were (0.36 ± 0.1 versus 0.31 ± 0.1) (P<0.03) statistically significant respectively. There are no significant differences found in mean of the lipid profile however, Pearson's correlation a significant correlation between free T3 and LDL (p=0.00). Spearman correlation showed a significant positive correlation between family history of diabetes and AIP in premature canities (r=0.285) (P=0.032). Discussion and Conclusion: As the age of the study participant was less than 25 years the lipid profile was within the normal limit however, the AIP showed a significant difference between the study subjects. The AIP is high in premature canities when compared with control. It also significantly correlated with family history of diabetic among premature canities. Which shows that premature canities may also act as marker for atherogenic risk. It's important to evaluate the atherogenic risk further with increased number of study population.

Keywords---atherogenic risk, premature canities, family history of diabetic, college students.

Introduction

Appearance of gray hair is a chronological ageing process, hence hair graying is referred as sign of ageing (1). Studies have shown the degree of hair graying associated with coronary artery disease (CAD) in geriatric population (2). Canities is a scientific term to refer graying of hair (3). Appearance of gray hair below the age of 25 years in Asian population referred as premature canities (4).The primary cause for premature canities are auto immune diseases (5). The factors associated with premature canities were obesity, smoking, family history of gray hair (6). Premature canities is considered as a metabolic risk factor (7). The Copenhagen city heart study says that visible ageing sign reflects your poor cardiovascular health status irrespective of the chronological ageing (8). Dyslipidemia is associated with coronary artery disease (9). Thyroid dysfunction is known to affect cardiovascular system (10) and Hence it's important to measure the serum lipid profile along with thyroid hormone for better understanding of dyslipidemia. Atherogenic Index of Plasma (AIP) considered as robust biomarker of dyslipidemia. Hence the aim of the present study is (i) to evaluate the association

of atherogenic risk in premature canities. (ii) to understand the interrelationship of premature canities with family history of diabetes and hypertension.

Materials and Methods

This cross-sectional study was conducted among the college students studying at ACS Medical College & Hospital, Chennai, India from June 2021 to October 2021. Exclusion criteria: Subjects on treatment for any clinical condition were excluded from this study. Inclusion criteria: Healthy volunteers of aged < 25 years were included in this study. This study was approved by institutional ethics committee. After taking informed consent the following data's like age, sex, presence of gray hair, family history of gray hair, family history of diabetes, family history of hypertension were collected in predesigned proforma. Anthropometric measurements like height, weight, Blood Pressure was measured. Body Mass Index (BMI) was calculated using the expression of BMI= Weight (kg)/ Height (m^2) (11). Fasting blood samples were collected in a plain tube and analysed lipid profile in semi autoanalyzer Microlab 300. Thyroid hormones were measured using Robonik ELISA Aanalyzer. Very Low Density Lipoprotein cholesterol (VLDL-c) and Low Density Lipoprotein-cholesterol (LDL-c) were derived using Freidewald's formula (VLDL cholesterol =TG/5), LDL cholesterol = TC - (HDL + TG/5) (12). The Atherogenic Index of Plasma (AIP) is calculated as log (TG/HDL) (13).

Statistical analysis

Statistical analysis was done by SPSS 20 software. Categorical data were expressed as percentages. All the other datas were expressed as Mean ± (SD). To find significant difference between the groups student's t-test was performed. P value <0.05 was considered as statistically significant. Spearman correlation analysis done to analyse the significant association between various parameters.

Results

Totally 122 subjects took part in the present study among them 61 subjects had premature canities referred as cases and 61 subjects referred as controls without premature gray hair. Among the premature canities 51% (n= 31) were males and 49 % (n=30) were females. There is no significant difference in the mean age of the subjects with and without premature canities (21.4 ± 1.7 versus 21.1 ± 1.4) respectively. HDL-c levels were significantly decreased in premature canities compared with controls (42.13 ± 7.1 versus 47 ± 7.4) (P=0.00). subjects with premature canities had significantly higher atherogenicity as measured by AIP compared with controls (0.36 ± 0.1 versus 0.31 ± 0.1) (P=0.03) . The demographic and clinical characteristics of the subjects are shown in table 1.

Table 1
Clinical and demographic characteristics of the studied population

	With premature canities (Mean ± SD) (n=61)	Without premature (Mean ± SD) (n=61)	P-value
Age (years)	21.4 ± 1.7	21.1 ± 1.4	0.22
SBP (mmHg)	113.2 ± 15.6	113.5 ± 17.1	0.94
DBP (mmHg)	74.4 ± 11.34	73.9 ±10.3	0.83
BMI	38.5 ± 7.8	36.6 ± 10.9	0.42
TC (mg/dl)	128 ± 27.4	129 ± 24.3	0.90
TG (mg/dl)	100 ± 32	97 ± 16.3	0.57
HDL-c (mg/dl)	42.13 ± 7.1	47 ± 7.4	0.0**
LDL-c (mg/dl)	66.6 ± 25.4	64.2 ± 26.2	0.61
VLDL-c (mg/dl)	20.4 ± 6.6	19.4 ± 3.3	0.31
AIP	0.36 ± 0.1	0.31 ± 0.1	0.03*
Free T3	2.7± 0.9	2.5 ± 0.80	0.17
Free T4	1.0 ± 0.43	1.11 ± 0.25	0.15
TSH	02.1 ± 1.7	2.51 ± 3.52	0.411

(P<0.05)*

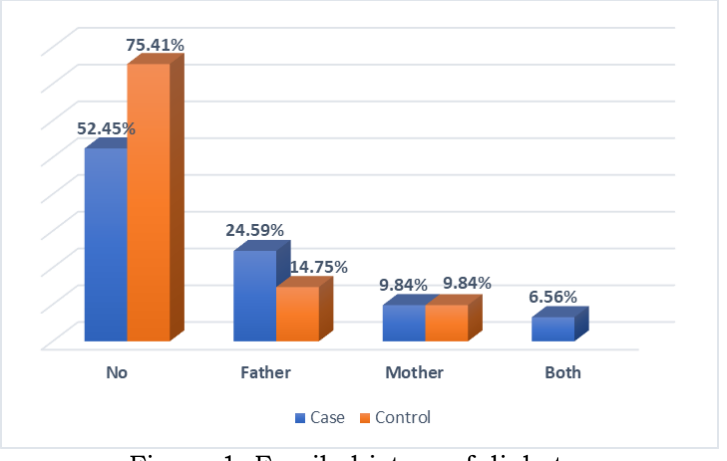

Figure 1. Family history of diabetes

Spearman correlation shows the positive significant correlation with family history of diabetes and AIP in subjects with premature canities (r=0.285) (p=0.032).

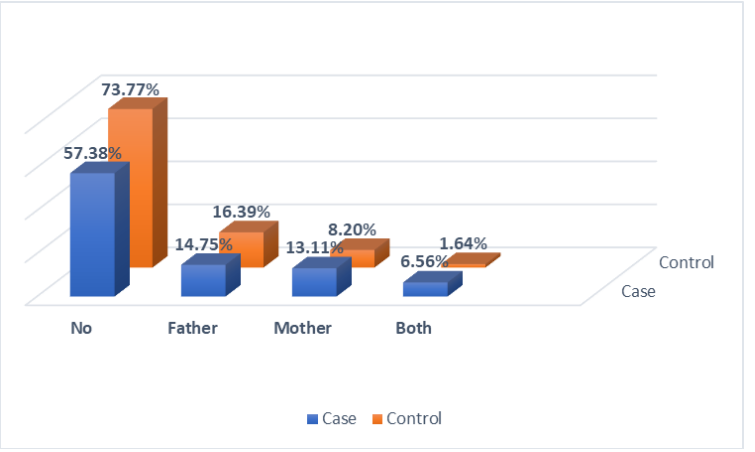

Figure 2. Family history of hypertension

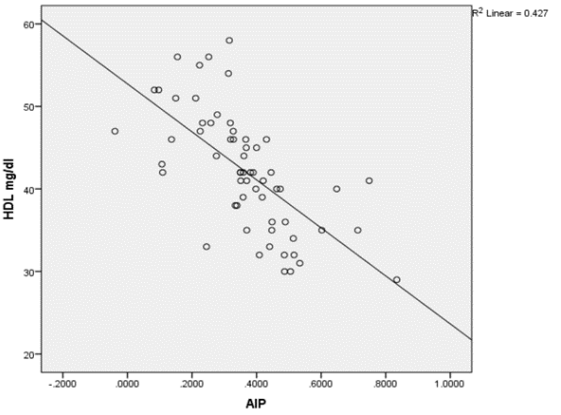

Figure 3. Atherogenic Index of plasma correlation graph

Discussion

Hair plays a significant role in self-confidence. The colour of the hair defined by the presence of pigment producing melanocytes. Hair colour varies from black, brown to blond red and it reflects the age and ethnicity (14). Ageing of hair depends on weathering of the hair shaft (15). Cessation of melanogenesis is a chronological ageing process hence, premature canities considered as biological ageing process (16) (1). In our study population premature canities were more prevalent in males than females which is similar to study done by Akin Belli *et al (17).* However, the study done by Daulatabad *et al* PMC were more prevalent in females compare to males with premature canities (18).

The lipid profiles were within normal limit this may be due to the lesser age of the study participants. In our present study though the lipid profiles were well within normal limits the. Increased AIP risk factor of cardiovascular disease (19). AIP in the premature canities subjects were significantly higher than control subjects. The AIP significantly correlates with premature canities this suggest that premature canities subjects are at increased risk of cardiovascular disease. In our

present study the family history of diabetes is (50.4%) in premature canities which is significantly correlates with atherogenic index of plasma. Among the premature canities the number of family history of diabetic high in father and it significantly correlates with AIP. Our present study is the first of its kind to show that AIP levels were high in premature canities.

Conclusion

As the age of the study participant is very less the lipid profile is normal, we measured the AIP and we found significant difference between the study subjects. This shows that though the lipid profile is within normal were the atherogenic factor is high in premature canities. Which indicates cardiovascular risk in premature canities. AIP also significantly correlated with family history of diabetic among premature canities. Which shows that premature canities may also act as a marker of atherogenic risk. It's important to evaluate the atherogenic risk further with increased number of study population.

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