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Original Research Article

Association of Male Pattern Hair Loss with Metabolic Syndrome

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Conflict of interest: Nil

Abstract

Background: Androgenetic alopecia (AGA) is the most common cause of hair loss. Although it is a medically benign condition, it can have a significant psychosocial impact on patients. The present study has been undertaken to determine the association of male pattern hair loss with metabolic syndrome.

Materials & Methods: 40 cases of Androgenetic alopecia and a control group consisting of 40 individuals without AGA or any systemic diseases and belonging to similar age and sex were selected. Complete evaluation of patients with Androgenetic alopecia was done. Diagnosis of Androgenetic alopecia was made through clinical findings. Clinical assessment of Androgenetic alopecia, the Hamilton Norwood classification, a Standard classification scheme with good test–retest reliability was used in male patients.

Results: Age group 20-29 years had 22 cases and 27 control, 30-39 years had 14 cases and 6 control, 40-49 years had 3 cases and 7 controls and >50 years had 1 case. Out of 40 AGA patients, 15 patients (37.5%) had Grade 2 AGA, 10 patients (25%) had grade 3 AGA, 8 patients (20%) had grade 4 AGA, 4 patients (10%) had grade 1 AGA, 1 patient (2.5%) each had grade 5,6,7 AGA respectively. The mean TG (mg/dl) was 155.35 and 133.15, HDL (mg/dl) was 40.20 and 44.83, FBS (mg/dl) was 108.15 and 101.21, SBP (mm/Hg) was 130.50 and 122.45 and DBP (mm/Hg) was 82.75 and 79.25 in cases and control respectively. Metabolic syndrome was statistically significantly more common in cases (47.5%) as compared to controls (15%). There was non- statistically significant difference in grades of AGA between patients with and without metabolic syndrome (P>0.05). There was no statistically significant difference with regard to duration of AGA in patients with and without metabolic syndrome (P> 0.05).

Conclusion: A higher prevalence of metabolic syndrome is seen in androgenic alopecia cases when compared with that of controls. A significant association was seen between the severity of androgenetic alopecia and metabolic syndrome.

Keywords: Androgenic alopecia, Metabolic syndrome, Hair

Introduction

Hair loss is a common condition that affects most people at some point in their lives. It can exist as an isolated problem or with other diseases and conditions. [1] Hair is the outermost layer coming in contact with environment. It protects from environmental factors like heat, ultraviolet and electromagnetic rays, dust, insects, and abrasions. Hairs on scalp absorb harmful radiations from the sun, thus help to protect skull from excessive heat and cold. [2]

Androgenetic alopecia (AGA) is the most common cause of hair loss. Although it is a medically benign condition, it can have a significant psychosocial impact on patients. [3] It is a very common condition encountered in almost all dermatology Out Patient Department across the world. Androgenetic alopecia represents patterned hair loss and the classic male pattern hair loss involves mostly the frontal, temple and vertex areas of scalp. In addition, men are found to be susceptible to certain systemic disorders like Cardiovascular Diseases, Metabolic Syndrome, Hypertension, Diabetes etc. [4] Hair loss could be a manifestation of metabolic abnormalities like increased blood pressure, increased total cholesterol, triglyceride levels and decreased HDL-C levels. [5] Hence there is a need to approach androgenetic alopecia as potentially multisystem disorder and keeping this in mind the present study has been undertaken to determine the association of male pattern hair loss with metabolic syndrome.

Materials & Methods

The present study comprised of all male patients with hair loss attending the Department of Dermatology, Venereology and Leprosy at MVJ Medical College and Research Hospital, Bangalore. Duration of study was 2 years. Ethical clearance for the study was taken from Institutional ethics committee.

Inclusion criteria was male patients having Androgenetic Alopecia, male patients in age group of <55 years and patients willing to give written informed consent. Exclusion criteria was other types of alopecia like alopecia areata(diffuse), chronic telogen effluvium, patients on drugs that are known to cause hyperglycaemia, hyperlipidemia and hypertension.

40 cases of Androgenetic alopecia and a control group consisting of 40 individuals without AGA or any systemic diseases and belonging to similar age and sex were selected. Complete evaluation of patients with Androgenetic alopecia was done. A detailed history was taken and a thorough systemic and cutaneous examination was done. Diagnosis of Androgenetic alopecia was made through clinical findings. Clinical assessment of Androgenetic alopecia, the Hamilton Norwood classification, a Standard classification scheme with good test–retest reliability was used in male patients. Hamilton Norwood type IV of AGA represents the starting grade of severe frontal AGA concurrent with vertex AGA (Fig- 1,2,3,4). Therefore, AGA was divided into two categories, normal to mild AGA -Hamilton Norwood types I–III and moderate or severe AGA -Hamilton Norwood types IV–VII, to assess its association with other potential risk factors.

Relevant investigations such as waist circumference greater than 102 cm in men, triglycerides greater than 150 mg/dl, high density lipoprotein cholesterol (HDL-C) less than 40 mg/dl in men, blood pressure >130mm systolic or >85mm diastolic and fasting plasma glucose levels greater than 100 mg/dl were recorded. Categorical data was assessed using Chi-square test of significance. P value < 0.05 was considered significant.

Results

Table 1: Distribution of patients

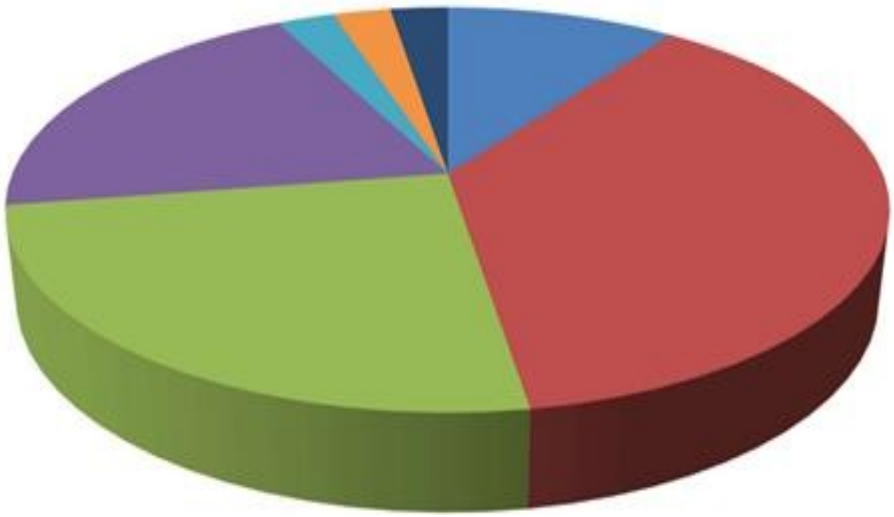
Age group	Cases	Control	P value
20-29 yrs.	22	27	0.57
30-39 yrs.	14	6	
40-49 yrs.	3	7	
≥ 50 yrs.	1	0	

Table I shows that age group 20-29 years had 22 cases and 27 control, 30-39 years had 14 cases and 6 control, 40-49 years had 3 cases and 7 controls and >50 years had 1 case. The difference was non- significant (P> 0.05).

Table 2: Distribution as per AGA grade

AGA Grade	Number	Percentage
Grade 1	4	10.0%
Grade 2	15	37.5%
Grade 3	10	25.0%
Grade 4	8	20.0%
Grade 5	1	2.5%
Grade 6	1	2.5%
Grade 7	1	2.5%

Table II, graph I shows that out of 40 AGA patients, 15 patients (37.5%) had Grade 2 AGA, 10 patients (25%) had grade 3 AGA, 8 patients (20%) had grade 4 AGA, 4 patients (10%) had grade 1 AGA, 1 patient (2.5%) each had grade 5,6,7 AGA respectively.



Graph 1: Distribution as per AGA grade

Table 3: Comparison of parameters

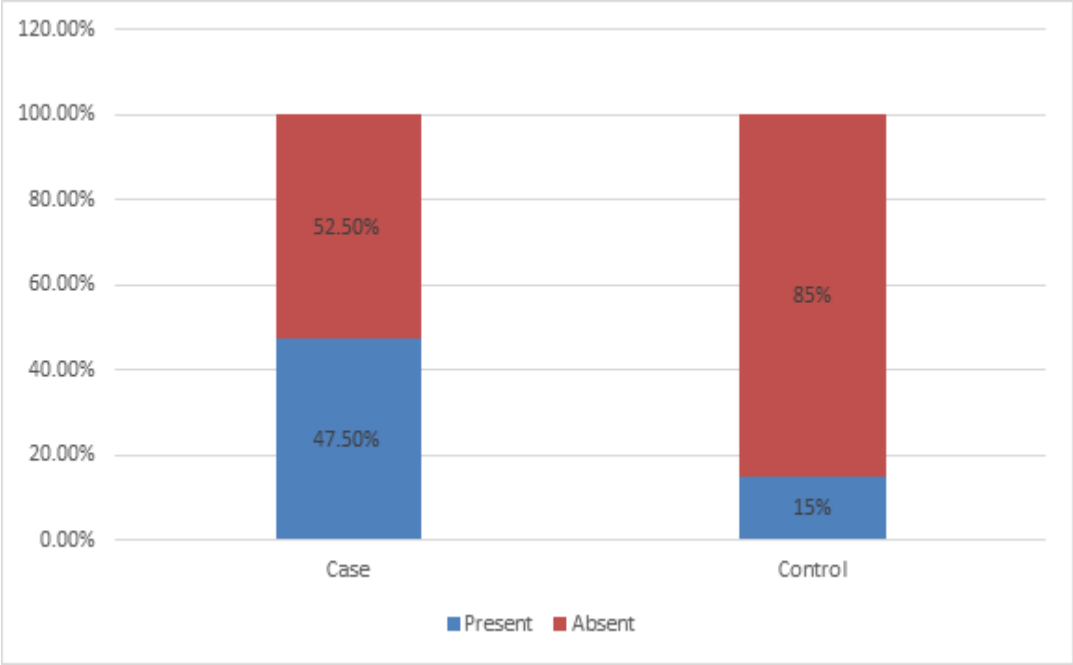
Parameters	Cases	Control	P value
TG (mg/dl)	155.35	133.15	0.01
HDL (mg/dl)	40.20	44.83	0.04
FBS (mg/dl)	108.15	101.21	0.05
SBP (mm/Hg)	130.50	122.45	0.02
DBP (mm/Hg)	82.75	79.25	0.05

Table III shows that mean TG (mg/dl) was 155.35 and 133.15, HDL (mg/dl) was 40.20 and 44.83, FBS (mg/dl) was 108.15 and 101.21, SBP (mm/Hg) was 130.50 and 122.45 and DBP (mm/Hg) was 82.75 and 79.25 in cases and control respectively. The difference was significant (P< 0.05).

Table 4: Prevalence of metabolic syndrome

Variable	Category	Case		Control		P-Value
		n	%	n	%	
Metabolic Syndrome	Present	19	47.5%	6	15.0%	0.002*
	Absent	21	52.5%	34	85.0%	

Table IV, graph I shows that metabolic syndrome was statistically significantly more common in cases (47.5%) as compared to controls (15%).



Graph 1: Prevalence of metabolic syndrome

Table 5: Association between Metabolic Syndrome and various AGA grades

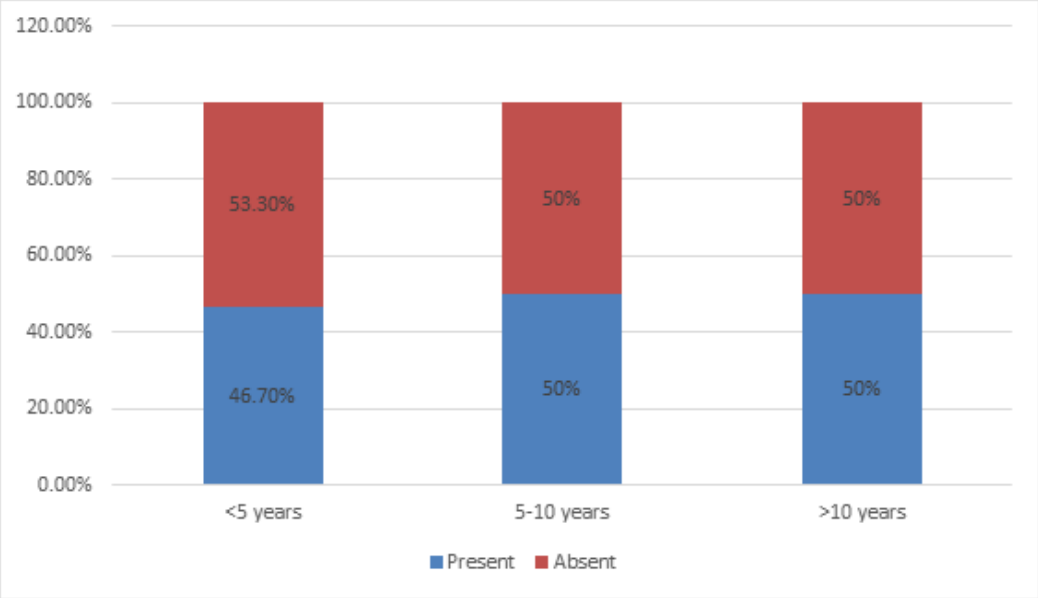
AGA Grade	Metabolic syndrome Present		Metabolic syndrome Absent		P-Value
	N	%	n	%	
Grade 1	1	5.3%	3	14.3%	0.68
Grade 2	7	36.8%	8	38.1%	
Grade 3	5	26.3%	5	23.8%	
Grade 4	4	21.1%	4	19.0%	
Grade 5	1	5.3%	0	0.0%	
Grade 6	0	0.0%	1	4.8%	
Grade 7	1	5.3%	0	0.0%	

Table V shows that there was non- statistically significant difference in grades of AGA between patients with and without metabolic syndrome (P>0.05).

Table 6: Association between presence of Metabolic Syndrome and duration of AA

Metabolic Syndrome	< 5 years		5-10 years		> 10 years		P-Value
	N	%	n	%	n	%	
Present	14	46.7%	4	50.0%	1	50.0%	
Absent	16	53.3%	4	50.0%	1	50.0%	0.98

Table VI, Graph II shows that there was no statistically significant difference with regard to duration of AGA in patients with and without metabolic syndrome (P> 0.05).



Graph 2: Association between presence of Metabolic Syndrome and duration of AA

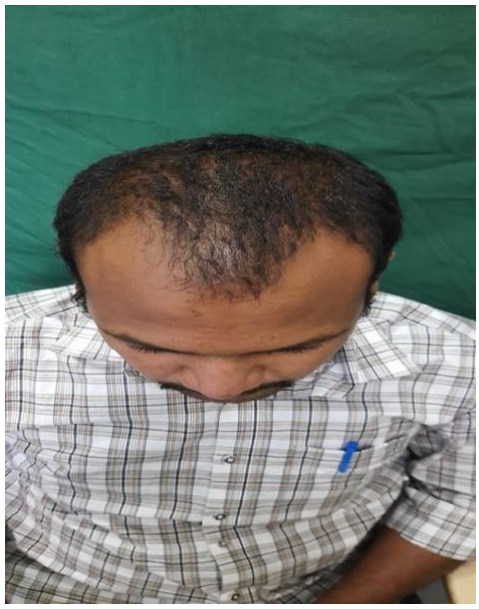


Figure 1: Androgenetic alopecia grade 3 (Norwood Hamilton classification)

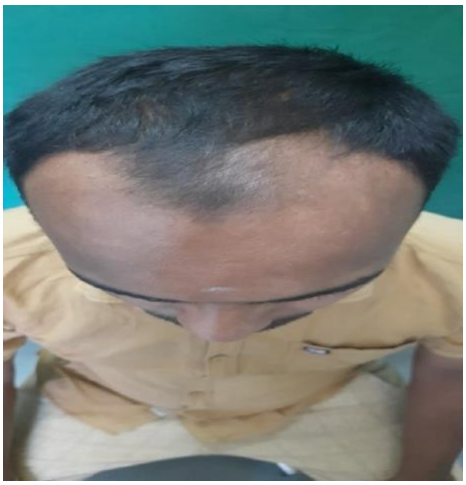


Figure 2: Androgenetic alopecia grade 4 (Norwood Hamilton classification)

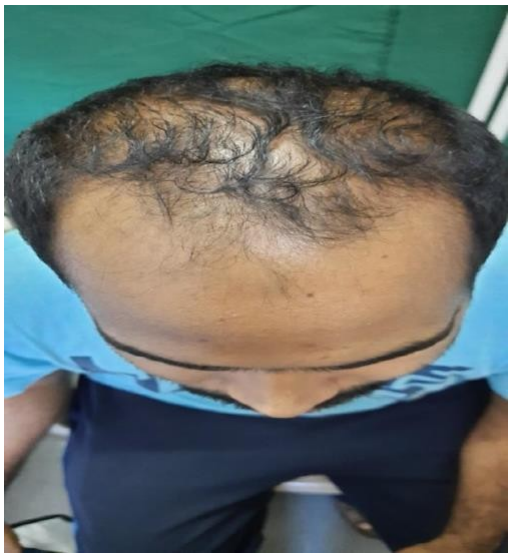


Figure 3: Androgenetic alopecia grade 5 (Norwood Hamilton classification)

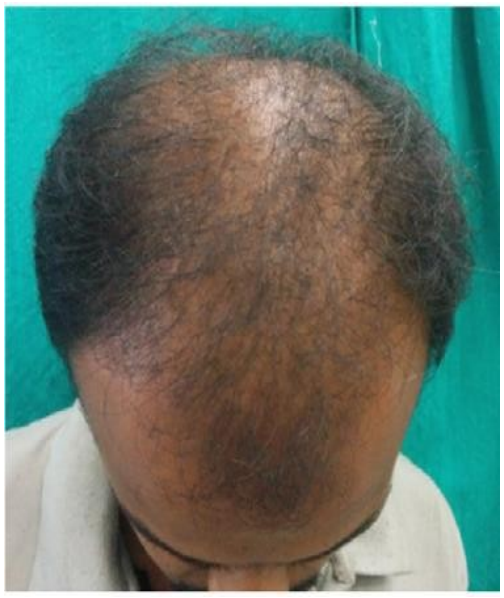


Figure 4: Androgenetic alopecia grade 6 (Norwood Hamilton classification)

Discussion

AGA is a common cosmetically and psychosocially distressing condition. AGA being a medically benign condition has been associated with an increased risk of coronary heart disease in various studies. [6] Although several previous studies have investigated the association. of metabolic syndrome with AGA the results have been inconsistent. [7,8] The present study was undertaken to study the prevalence of metabolic syndrome in male patients of AGA and compare with control population and study the relationship of metabolic syndrome with different grades of AGA.

We found that age group 20-29 years had 22 cases and 27 control, 30-39 years had 14 cases and 6 control, 40-49 years had 3 cases and 7 controls and >50 years had 1 case. Out of 40 AGA patients, 15 patients (37.5%) had Grade 2 AGA, 10 patients (25%) had grade 3 AGA, 8 patients (20%) had grade 4 AGA, 4 patients (10%) had grade 1 AGA, 1 patient (2.5%) each had grade 5,6,7 AGA respectively. In a study conducted by KC Dharam Kumar et al [9], 46 cases with AGA and 46 controls were included. Metabolic syndrome was seen in 39.13% of cases and 4.35% of controls which was statistically significant.

In a study by Mohd R Tilwani et al [10] of the 100 male Androgenetic alopecia patients 60 patients had mild to moderate AGA and 40 patients had severe AGA. Metabolic syndrome was seen in 14 % of cases and 3% of controls which was statistically significant. Among patients of AGA, metabolic syndrome was statistically present in severe AGA compared to mild to moderate AGA.

We observed that mean TG (mg/dl) was 155.35 and 133.15, HDL (mg/dl) was 40.20 and 44.83, FBS (mg/dl) was 108.15 and 101.21, SBP (mm/Hg) was 130.50 and 122.45 and DBP (mm/Hg) was 82.75 and 79.25 in cases and control respectively.
Gaitha M Upadhya et al [11] in their study on 86 cases and 86 controls found that metabolic syndrome was seen in 19 (22.4%) of patients with AGA and 8 (9.4%) controls which was statistically significant.

We observed that metabolic syndrome was statistically significantly more common in cases (47.5%) as compared to controls (15%). There was non- statistically significant difference in grades of AGA between patients with and without metabolic syndrome ($P>0.05$). There was no statistically significant difference with regard to duration of AGA in patients with and without metabolic syndrome ($P> 0.05$). Chakrabarty et al [12] assessed the frequency of Met S in individuals with early AGA in Indian settings. The Norwood-Hamilton classification was used to assess the grade of AGA. Met S was defined according to the National Cholesterol Education Program Adult Treatment Panel III criteria. Blood pressure, blood glucose, lipid parameters, and body mass index along with anthropometric measurements were assessed in all study participants. [13] Met S was seen in a higher proportion of patients with AGA (43.5%) as compared to the control group (2.4%) and the differences were statistically significant ($P< 0.001$). As compared to controls, patients with AGA had higher triglycerides ($P< 0.001$), systolic blood pressure ($P < 0.001$), diastolic blood pressure ($P< 0.001$) along with significantly lower high-density lipoprotein cholesterol levels ($P< 0.001$). Severity of AGA was not associated with Met S.

Conclusion

Authors found that a higher prevalence of metabolic syndrome is seen in androgenic alopecia cases when compared with that of controls. A significant association was seen between the severity of androgenetic alopecia and metabolic syndrome. This may suggest an association of androgenetic alopecia with metabolic

syndrome and early screening for metabolic syndrome is beneficial in patients with androgenic alopecia.

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