Original research article

A hospital-based study to assess the prevalence of Androgenetic alopecia in young male patients admitted to a Cardiac care unit

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Abstract

Background: Androgenetic alopecia (AGA), commonly known as male pattern baldness, is a hereditary condition that affects a significant portion of the population worldwide. The relationship between AGA and cardiovascular risk factors has been a topic of interest in recent years, prompting the need for further studies.

Aim: This study aims to investigate the prevalence of AGA among young male patients admitted to a cardiac care unit (CCU) in a tertiary care hospital.

Material and methods: The study involves a cross-sectional analysis of patient data, including medical history, clinical examination, and relevant demographic information, to determine the prevalence and potential associations between AGA and cardiac conditions in this specific cohort.

Results: A total of 180 patients were recruited in the study. The age of the patients varied from 22 to 45 with a mean of 26.27. AGA was seen in 98 (54.4%) of the cases; with 61 (62.2%) patients having mild-moderate AGA while severe AGA was seen in 37 (37.8%) patients.

Conclusion: Our study provides support for the hypothesis that vertex pattern baldness can be a marker for increased risk of cardiovascular events. Further research is needed to corroborate these findings and to clarify the biological mechanisms underlying this relationship.

Keywords: Androgenetic alopecia, vertex baldness, male pattern baldness, coronary artery disease

Introduction

Androgenic alopecia (AGA) is common dermatological condition characterized by progressive hair loss in genetically predisposed persons. AGA is manifested by androgen-dependent miniaturization of dermal papillae, a process regulated by complex hormonal mechanisms controlled by local genetic codes. It is not clear whether androgenetic alopecia is genetically homogeneous, and some authorities have suggested that the early onset of alopecia before the age of 36 year is genetically different from the late onset alopecia.[1] Recent research has indicated a potential link between AGA and cardiovascular risk factors, emphasizing the importance of investigating this association in specific patient populations. AGA as a risk factor for coronary artery disease (CAD) was first

suggested by Cotton *et al.*[2] It has been demonstrated that severe early onset of AGA in young subject (<30 years) have an increased risk of ischemic heart disease (IHD).[3] The cardiac care unit (CCU) offers a unique opportunity to study the prevalence of AGA in young male patients, as they often present with acute cardiac conditions that might be related to cardiovascular risk factors associated with AGA.

Material and methods

This was a cross-sectional observational study carried out over a period of six months (March 2020 to August 2020) in Department of Medicine, GMC, Jammu. Male patients aged 18-45 years admitted to a cardiac care unit (CCU) were enrolled in the study after obtaining a informed written consent.
Exclusion criteria were:
1. Patient aged more than 45 years
2. Female gender
3. Patients with other type of alopecia like alopecia areata, scarring alopecia
4. Patients with known skin disease affecting scalp hair like psoriasis, seborrheic dermatitis
5. Patients who refused to give consent for the study.

Data was collected through medical records, clinical examinations, and whenever required; through structured interviews with patients or attendants. Demographic information including age, occupation, family history of alopecia and family history of cardiovascular disease, was recorded in a predesigned proforma. Data regarding medical history, cardiovascular risk factors (e.g. hypertension, dyslipidemia, diabetes) and history of smoking and alcohol, was obtained.
Presence of AGA was assessed with the help of an experienced Dermatologist and was graded according to Norwood-Hamilton scale.[4] Grade I-III was taken as mild to moderate male pattern AGA and grade IV and higher as severe.

All the data was properly coded and entered in Microsoft Excel and analyzed using SPSS software. Descriptive statistics will be used to summarize demographic characteristics and AGA prevalence. Appropriate tests of significance were applied wherever required.

Results

A total of 180 patients were included in the study. The demographic profile of the patients is listed in Table.1

Variable		Cases (n=180)
Age in years (mean)		22-45 (26.27)
Occupation	Students	44 (24.4%)
	Govt./private employees	83 (46.1%)
	Businessmen	53 (29.4%)
Smoker		26 (14.4%)
Alcohol intake		35 (19.4%)

The prevalence of hypertension, diabetes and dyslipidemia (increased cholesterol, increased triglycerides, increased LDL or decreased HDL) in cases is depicted in Fig.1

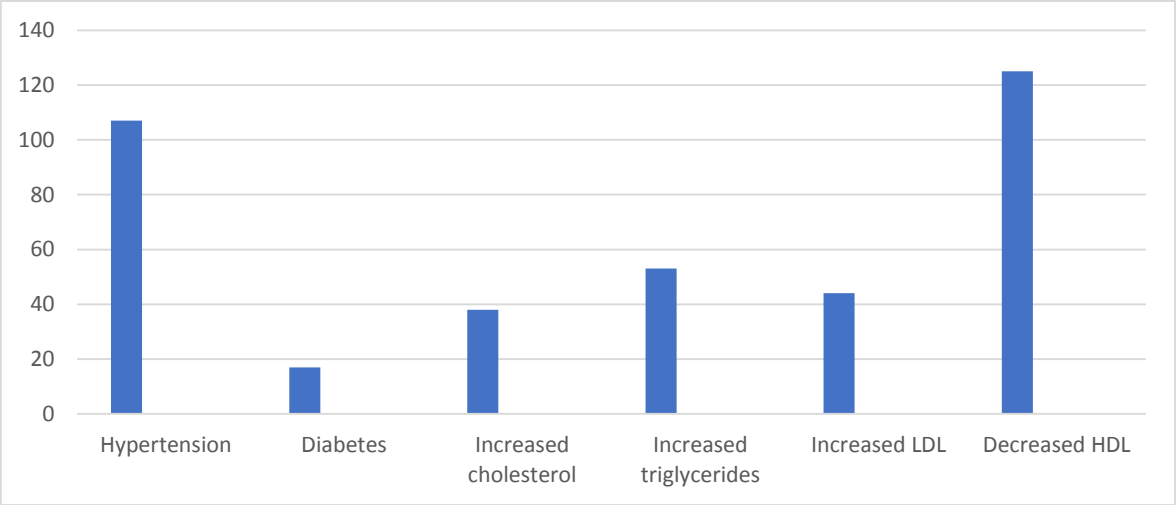
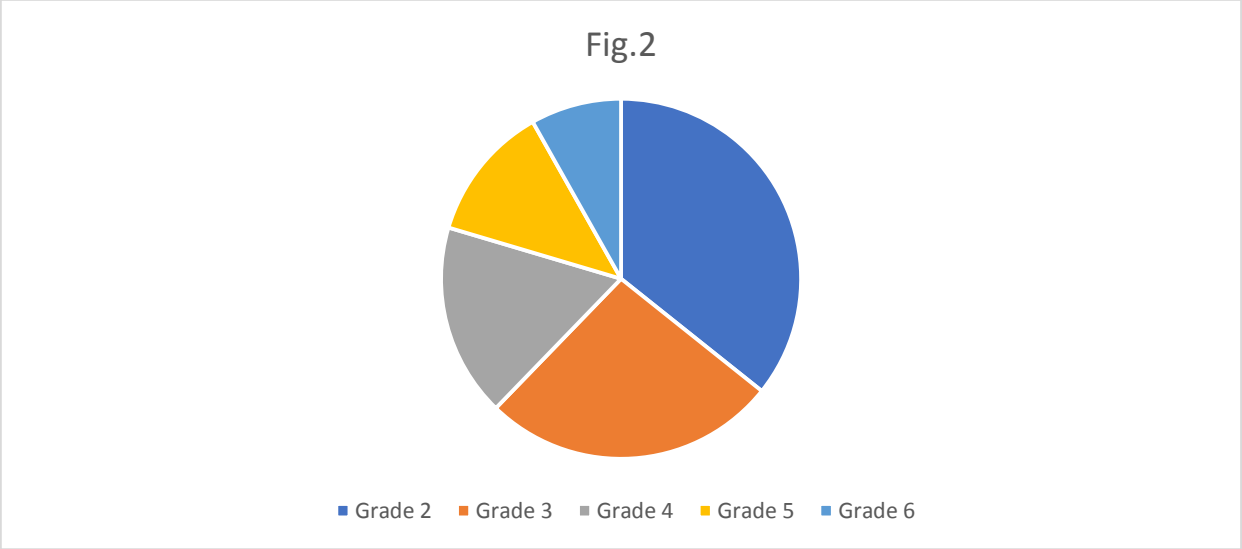


Fig.1 Prevalence of cardiovascular risk factors in study subjects

Out of 180 patients, AGA was seen in 98 patients (54.4%). Out of 98 patients, 35 (35.7%) had grade II AGA, 26 (26.5%) % had grade III AGA, 17 (17.3%) had grade IV AGA, 12 (12.2%) had grade V alopecia and 8 (8.2%) had grade VI AGA according to Hamilton- Norwood classification (Fig.2) According to severity, 62.2% patients had mild-moderate AGA and 37.8% had severe AGA.



Discussion

In 1972, Susan G. Cotton *et al.* first proposed the relationship between CAD and AGA.[2] Since then, several pieces of epidemiological researches have concluded that AGA is positively relevant to coronary atherosclerosis, CAD and myocardial infarction.[5][6][7] In addition, several studies have shown that early-onset AGA is associated with increased CAD risk, revealing the role of early-onset AGA in predicting CAD risk.[8][9] Some other studies have shown that alopecia, chest hair and diagonal earlobe creases can be used as dermatological indicators of CAD risk.[10][11]
The exact mechanism between AGA and increased cardiovascular risk yet remains to be elucidated. Elevated serum-free androgen levels are correlated with AGA, and may be the underlying physiological mechanism of AGA patients' susceptibility to CAD.[12] In previous studies, serum-free androgens have a significant stimulating effect on DNA synthesis of VSMC and may stimulate VSMC proliferation to promote atherosclerosis and cause vasoconstriction leading to hypertension. Men with severe baldness seem to have a greater number of androgen receptors in the scalp and

higher levels of both serum total and free testosterone.[13][14] One alternative possible link between AGA and CAD could be a similar pattern of inheritance, as others have speculated.[15]
Although vertex baldness may be a nonmodifiable risk factor for CAD, it may serve as a useful clinical marker to identify men at increased risk, who may benefit from aggressive screening and primary prevention. Previously various studies have been conducted to study the prevalence of various metabolic risk factors associated with CAD in patients of AGA. However, to the best of our knowledge this is the first study aimed to study the prevalence of AGA in known patients of cardiovascular diseases.

Conclusion

By exploring the potential link between AGA and cardiovascular risk factors, this study strives to offer valuable information for clinicians and researchers to develop strategies for early intervention and preventive measures. Also, presence of AGA should warrant clinicians to investigate for presence of any underlying cardiovascular risk factors; thus initiating preventive measures at an early stage and mitigating the dreaded complications of CAD.

Limitations

1. The study's cross-sectional design limits the ability to establish causal relationships between AGA and cardiac conditions.
2. The sample might be limited to a single hospital, affecting the generalizability of the findings.
3. The study does not include long-term follow-up data to assess the progression of AGA and its impact on cardiovascular outcomes.

Conflict of interest: None to declare
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