

Ministry of Higher Education and
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Diyala University College of Medicine



Androgenetic Alopecia In Medical Students Of Diyala

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Bachelor Degree in medicine and general surgery.

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

{ هُوَ الَّذِي جَعَلَ الشَّمْسَ ضِيَاءً وَالْقَمَرَ نُورًا وَقَدَرَهُ مَنَازِلَ لِتَعْلَمُوا عَدَدَ
السِّنِينَ وَالْحِسَابَ مَا خَلَقَ اللَّهُ ذَلِكَ إِلَّا بِالْحَقِّ يُفَصِّلُ الْآيَاتِ لِقَوْمٍ يَعْلَمُونَ }

سورة يونس - الآية 5.

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Abstract

Background: Androgenic alopecia is a common form of hair loss in both men and women. In men, this condition is also known as male-pattern baldness. Hair is lost in a well-defined pattern, beginning above both temples, over time, the hairline recedes to form a characteristic "M" shape, hair also thins at the crown (near the top of the head), often progressing to partial or complete baldness, the pattern of hair loss in women differs from male-pattern baldness. In women, the hair becomes thinner all over the head, and the hairline does not recede, Androgenetic alopecia in women rarely leads to total baldness, in men has been associated with several other medical conditions including coronary heart disease and enlargement of the prostate. Additionally, prostate cancer, disorders of insulin resistance (such as diabetes and obesity), and high blood pressure (hypertension) have been related to androgenetic alopecia. In women, this form of hair loss is associated with an increased risk of polycystic ovary syndrome (PCOS). PCOS is characterized by a hormonal imbalance that can lead to irregular menstruation, acne, excess hair elsewhere on the body (hirsutism), and weight gain.

Aim: The aim of study is to determination of prevalence of Androgenic alopecia in Diyala university college of medicine.

Subject and methods: The current study is cross section study type was carried out in Diyala medical students from 1th of December 2022 to the 25th of March 2023. Sample taken was stratified sampling.

Results: the total sample of study was (210), the about (33%) of Diyala medical students with androgenic alopecia and (67%) without androgenic alopecia. the male is most common with androgenic alopecia in percentage (38%) while female only (27.5%). the stage 6 is the most common stage with androgenic alopecia (32%) flowed by stage 5 and 4 in percentage (22%), (15%) respectably . the genetics is the most risk factors for androgenic alopecia (34%), then stress and hormonal changes (31%), (25%) respectively.

Conclusions: There is third of Diyala medical students with androgenic alopecia. The male is most common with androgenic alopecia than female. Sixth stage is the most stage in of Diyala medical students with androgenic alopecia followed by fifth and fourth stage. Genetic and stress is the most common risk factors with androgenic alopecia.

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Introduction

Androgenetic alopecia is a common form of hair loss in both men and women. In men, this condition is also known as male-pattern baldness. Hair is lost in a well-defined pattern, beginning above both temples, over time, the hairline recedes to form a characteristic "M" shape, hair also thins at the crown (near the top of the head), often progressing to partial or complete baldness, the pattern of hair loss in women differs from male-pattern baldness. In women, the hair becomes thinner all over the head, and the hairline does not recede, Androgenetic alopecia in women rarely leads to total baldness [1].

Androgenetic alopecia in men has been associated with several other medical conditions including coronary heart disease and enlargement of the prostate. Additionally, prostate cancer, disorders of insulin resistance (such as diabetes and obesity), and high blood pressure (hypertension) have been related to androgenetic alopecia. In women, this form of hair loss is associated with an increased risk of polycystic ovary syndrome (PCOS). PCOS is characterized by a hormonal imbalance that can lead to irregular menstruation, acne, excess hair elsewhere on the body (hirsutism), and weight gain [2].

Androgenetic alopecia is a frequent cause of hair loss in both men and women. This form of hair loss affects an estimated 50 million men and 30 million women in the United States, androgenetic alopecia can start as early as a person's teens and risk increases with age; more than 50 percent of men over age 50 have some degree of hair loss. In women, hair loss is most likely after menopause, pattern or androgenetic alopecia is a genetically predetermined disorder due to excessive response to androgens which affects up to 50% of males and females, it is characterized by progressive loss of terminal hair of the scalp any time after puberty, in a characteristic distribution in both males and females. In males, hair loss is most prominent in the vertex and frontotemporal regions, while in women the frontal hairline is typically spared with diffuse apical hair loss noted as a wider anterior part of the hair [3].

Androgenetic alopecia, as the name suggests has a clear genetic predisposition and is likely due to an excessive response to androgen, pattern alopecia is a polygenic disorder with variable penetrance, and both maternal and paternal genes are involved, there is a familial predisposition to androgenetic alopecia with sons at a five to six time higher relative risk if their fathers were balding, pattern alopecia also requires androgen to occur. It develops only after puberty, males castrated before puberty and those with androgen insensitivity syndrome do not have pattern baldness. It is clear that both hormone metabolism and androgen receptor play a key role in pattern alopecia [4].

White patients are most affected followed by Asians and African Americans, then Native Americans and Eskimos. The incidence approximates the age in Caucasian males, with 50% affected by 50 years old and up to 80% affected by 70 years old. In females, the disorder is quite common, with an increase in incidence after menopause, activation of the androgen receptor shortens the anagen or growth phase in the normal hair growth cycle. In androgenetic alopecia, excessive activation leads to follicular miniaturization through a progressively shorter anagen phase, resulting in thinner and shorter hair follicles which in the end may not even penetrate through the epidermis. Pathological specimens will show a decreased 5:0 ratio of anagen to telogen hair where the norm is 12:1 [5].

Androgenetic alopecia patients have higher production of dihydrotestosterone, and higher levels of 5 alpha-reductase and androgen receptors in balding scalp, there are two major isoforms of the 5 alpha-reductase enzyme. The 5 alpha-reductase converts testosterone to DHT (dihydrotestosterone), which has a much greater affinity for the androgen receptor. Type 2 5 alpha-reductase enzyme plays a greater role in androgenetic alopecia [6].

Type 1 5 alpha-reductase enzymes are in sebaceous glands, keratinocytes, and sweat glands. Type 2 5 alpha-reductase enzymes are in the outer root sheath of hair follicles, epididymis, vas deferens, seminal vesicles, and prostate, androgenetic alopecia is gradual in onset and occurs after puberty. In men, it begins as bitemporal thinning of frontal scalp first then involves the vertex, in women, it is noted as thinning of hair between the frontal and the vertex of the scalp without affecting the frontal hairline and usually demonstrated as a wider part or a visible scalp, in men, early androgenetic alopecia is defined as occurring before 30 years old and is

seen as the male phenotypic equivalent to a polycystic ovarian syndrome, in women, pattern baldness is often unmasked by telogen effluvium, which occurs 1 to 6 months after a stressor causes a larger portion of the hair to shift from the anagen phase to the telogen phase, leading to an increasing number of hair follicles in the exogen phase, in both males and females, it is not known how far pattern baldness will progress [7].

Androgenetic alopecia is usually diagnosed clinically with a history of gradual onset, occurring after puberty, and often but not necessarily, a family history of baldness. A biopsy is usually not necessary unless the diagnosis is unclear. Dermoscopy shows miniaturized hair and brown perihilar casts which can help differentiate from diffuse alopecia areata that mimics male pattern baldness as diffuse alopecia areata will have tapered fractures such as exclamation point hairs [8].

A thorough review of systems, past medical history, and the patient's medication list is important to ensure other causes are not present for hair loss or other reasons for the unmasking of the androgenetic alopecia. Thyroid studies, CBC, screening for iron deficiency with iron, total iron binding capacity, and ferritin may be warranted. Screen for syphilis if suspected. A quick psychiatric screen for depressive symptoms and other psychiatric disorders may also be warranted in all hair loss patients visiting a dermatologist [9].

There are two FDA approved drugs for pattern baldness: topical minoxidil and finasteride, both of which require at least a 4- to 6-month trial before noticing improvement and must be used indefinitely to maintain a response. As such, medication adherence often can be poor. Furthermore, initiation of the drug may cause an initial shedding phase. They work better together [10].

Topical minoxidil is available over-the-counter and in various strengths, up to 5% solution. Higher strengths are more effective. The most common adverse effects are pruritus and local irritation with resulting flaking. The latter is usually due to propylene glycol or alcohol in the formulation of the drug. Minoxidil is a potassium channel blocker and widens blood vessels which hypothetically allow more oxygen, blood, and nutrients to follicles and promote the anagen phase, Finasteride is a 5 alpha-reductase type 2 inhibitor and not an anti-androgen, it is prescribed at 1 mg daily and is more effective at increasing hair regrowth at the vertex than the frontal area of the scalp. The efficacy of finasteride is unclear in female pattern baldness and contraindicated for women with

reproductive potential (Category X) as it can cause a male fetus to develop ambiguous genitalia, adverse effects include sexual dysfunction, which usually reduces with time; increased risk of high-grade prostate cancer because PSA is masked and detected later; and case reports of persistent diminished libido and erectile dysfunction [11].

ANDROGENETIC ALOPECIA IN MEN AND WOMEN

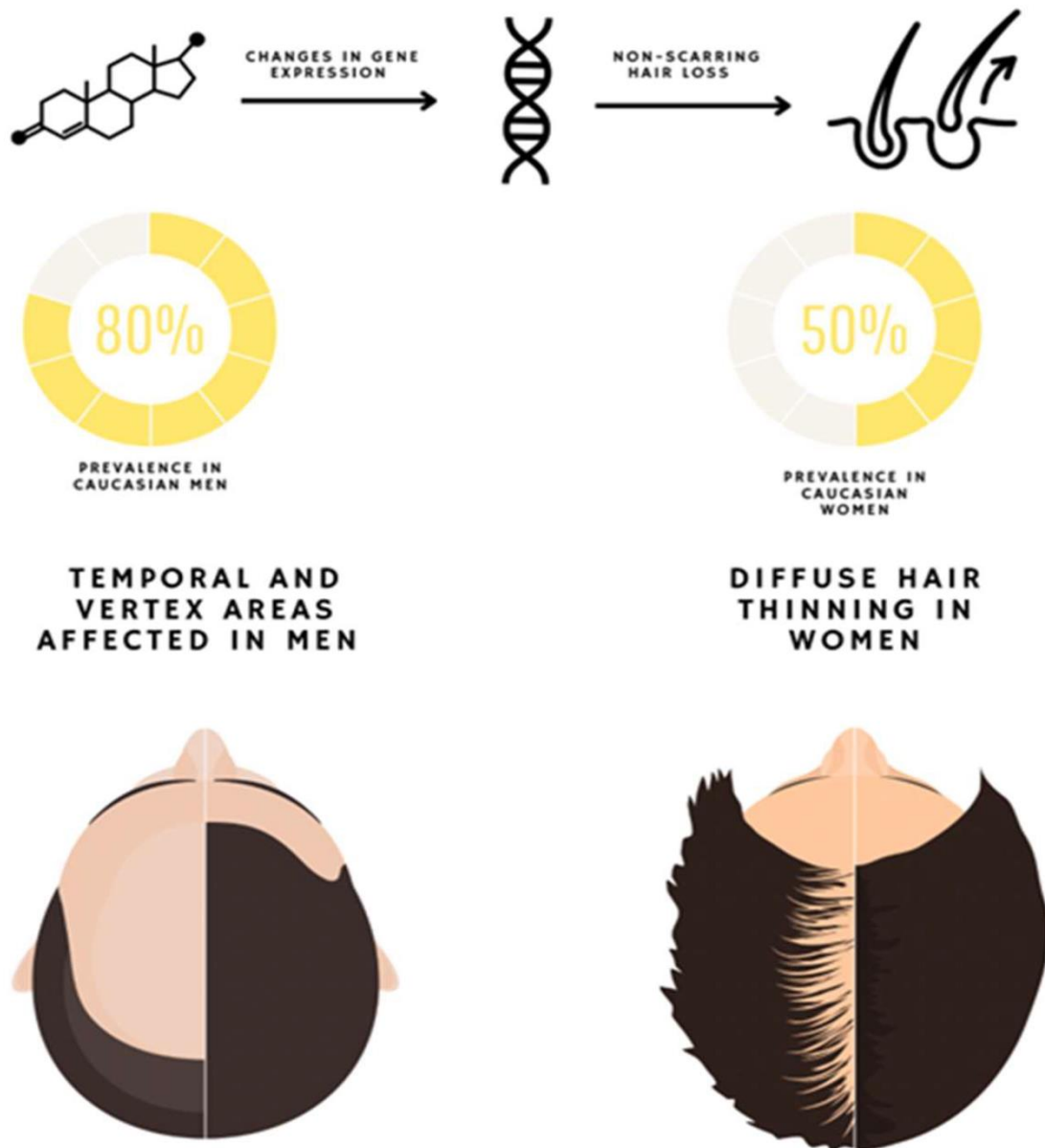


Figure 1. Androgenic alopecia in men and women.

Other drugs used in pattern baldness are not FDA-approved, Dutasteride is three times more potent on type II 5 alpha-reductase enzyme, 100 times more potent on type I enzyme, and often used on patients who failed finasteride. The adverse effect profile is similar to finasteride, in women, oral antiandrogens such as spironolactone are often used. Spironolactone is a very weak partial agonist to the androgen receptor, blocking the much more potent DHT and free testosterone from interacting with the androgen receptor, thus physiologically behaving like a direct antagonist. It also inhibits androgen synthesis and enhances conversion of testosterone to estradiol, Cyproterone acetate may be used internationally but is not available in the United States. Anti-androgens are more effective if there are other signs of virilization [12].

Hair transplant is effective and cosmetically satisfactory to the patient. However, patients need to have a sufficient number of donor plugs (greater than 40 follicular units/cm²) to cover the bald area, New techniques have made hair transplant more cosmetically pleasing and natural looking, Red light or laser at 660 nm also has demonstrated efficacy for hair loss and is available OTC for pattern baldness, other proposed treatments include saw palmetto extract (*Serenoa Repens*); prostaglandin analogs like latanoprost and bimatoprost, which may be cost prohibitive; and multiple growth factors, which are a theoretical reason why platelet-rich plasma and adipose-derived stem cells may be used as adjunctive to treatments listed [13].

Platelet-rich plasma (PRP) has shown remarkable beneficial effects without any major adverse reactions in the treatment of androgenic alopecia. The growth factors in activated autologous PRP induce the proliferation of dermal papilla cells, PRP is a blood-derivative previously used in thrombocytopenia treatment, over time, when the regeneration-stimulating effect of PRP was observed, it began to be used in many other fields of medicine, including orthopedics, gynecology, dermatology, urology, and ophthalmology, Current dermatology applications include hair loss treatment, wound healing improvement, skin rejuvenation and scar appearance improvement, to obtain PRP, citrated whole blood is used in the centrifugation process, which prevents coagulation. The addition of anticoagulant enables treatment providers to obtain liquid PRP, after centrifugation, blood is divided into three layers: red blood cells (RBC) and leukocytes, PRP, and platelet-poor plasma (PPP) [14].



Figure 2. Centrifugation and platelet-rich plasma separation.

A high concentration of autologous platelets is present in a small quantity of plasma after centrifugation of the patient's blood. Alpha granules in the platelets induce stem cell regeneration and promote remodeling of soft tissue. There are many growth factors in alpha granules of thrombocytes, such as platelet-derived growth factors (PDGF), vascular endothelial growth factor (VEGF), epithelial growth factor (EGF), transforming growth factor-beta (TGF beta), and insulin-like growth factor (IGF) [15]. The mitogenesis and differentiation of monocytes, fibroblasts, stem cells, keratinocytes, and endothelial cells occurs due to growth factors in the PRP alpha granule [15].

Subjects and methods

Ethical and Approval Consideration

Permission was taken from mothers and grandmothers to fill the information required and they were assured regarding the confidentiality of their responses. The aim of the study was explained and only those who agreed to participate are included in the study .

Study Population

The study was performed among students of Diyala university college of medicine .

Study design

The current study is cross section study type was carried out in Diyala medical students from 1th of December 2022 to the 25th of March 2023. Sample taken was stratified sampling.

Sample size and sample procedure

The sample size was 210 cases. Trained very well to interview the questionnaire carefully and in scientific way to avoid any bias. Respondents were assured that the information obtained would be confidential and used only for statistical purposes.

Data Analysis and Presentation

All data management and analysis was done by using manual statistical methods. Data have been represented suitable tables and figures.

Results

The total sample of study was (210), the male and female was (105) for each, and there is sixth stage each stage sample size was (35).

There is (69) of Diyala medical students with androgenic alopecia.

Table 1: the distributions of androgenic alopecia according to the gender.

Gender	With androgenic alopecia	Without androgenic alopecia	Total
Male	40 (38%)	65 (62%)	105
Female	29 (27.5%)	76 (72.5%)	105

This table shows that the male is most common with androgenic alopecia in percentage (38%) while female only (27.5%).

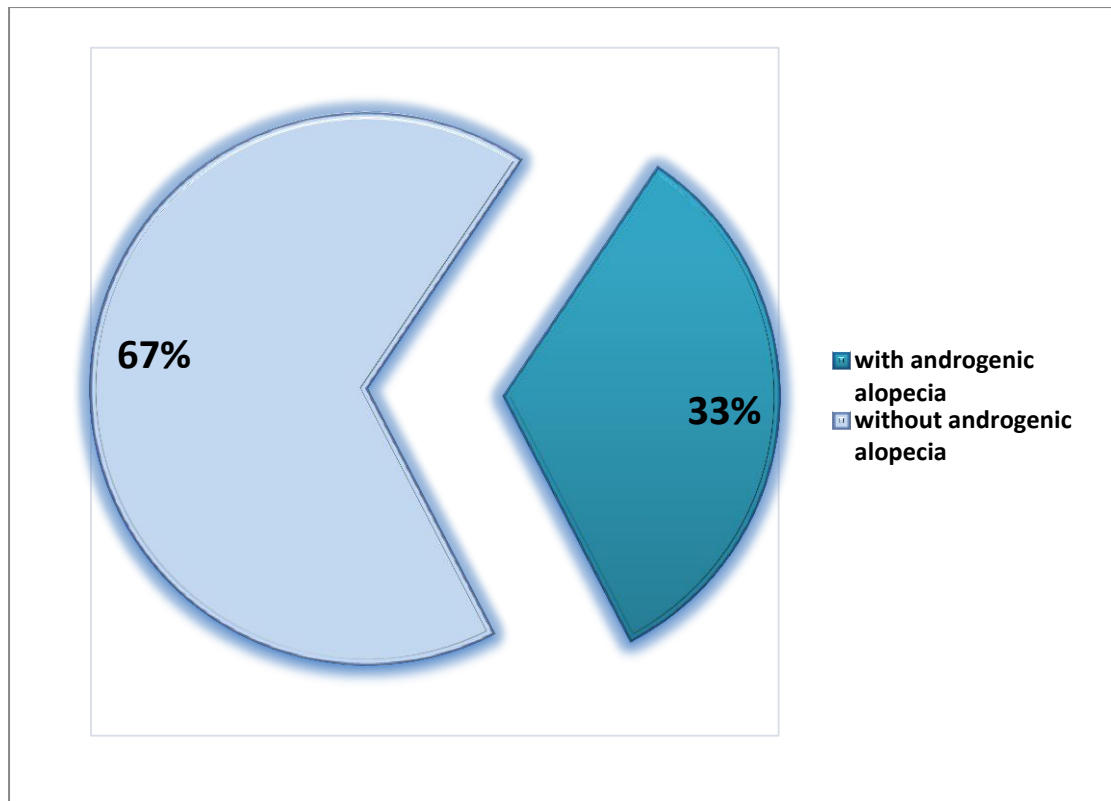


figure 1: The prevalence of androgenic alopecia.

This figure shows that the about (33%) of Diyala medical students with androgenic alopecia and (67%) without androgenic alopecia.

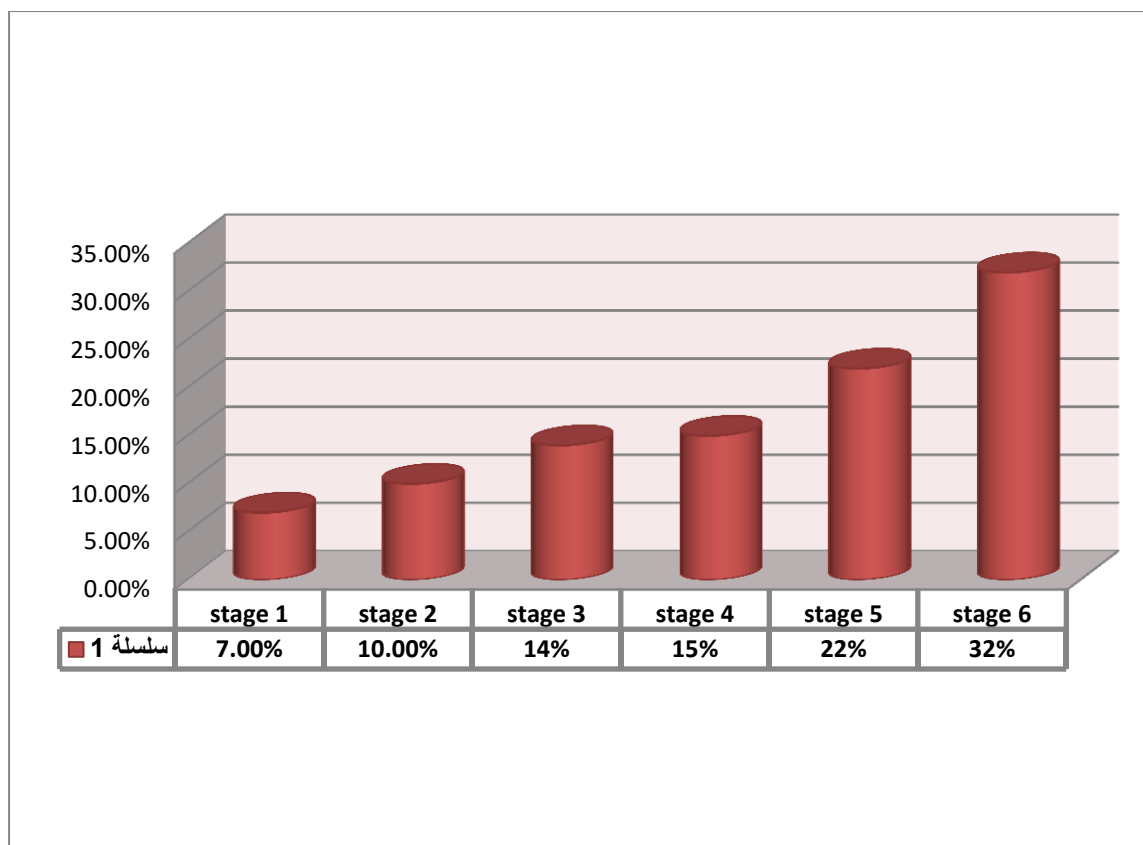


figure 2: The distributions of androgenic alopecia according to the stage.

This figure shows that the stage 6 is the most common stage with androgenic alopecia (32%) flowed by stage 5 and 4 in percentage (22%), (15%) respectably .

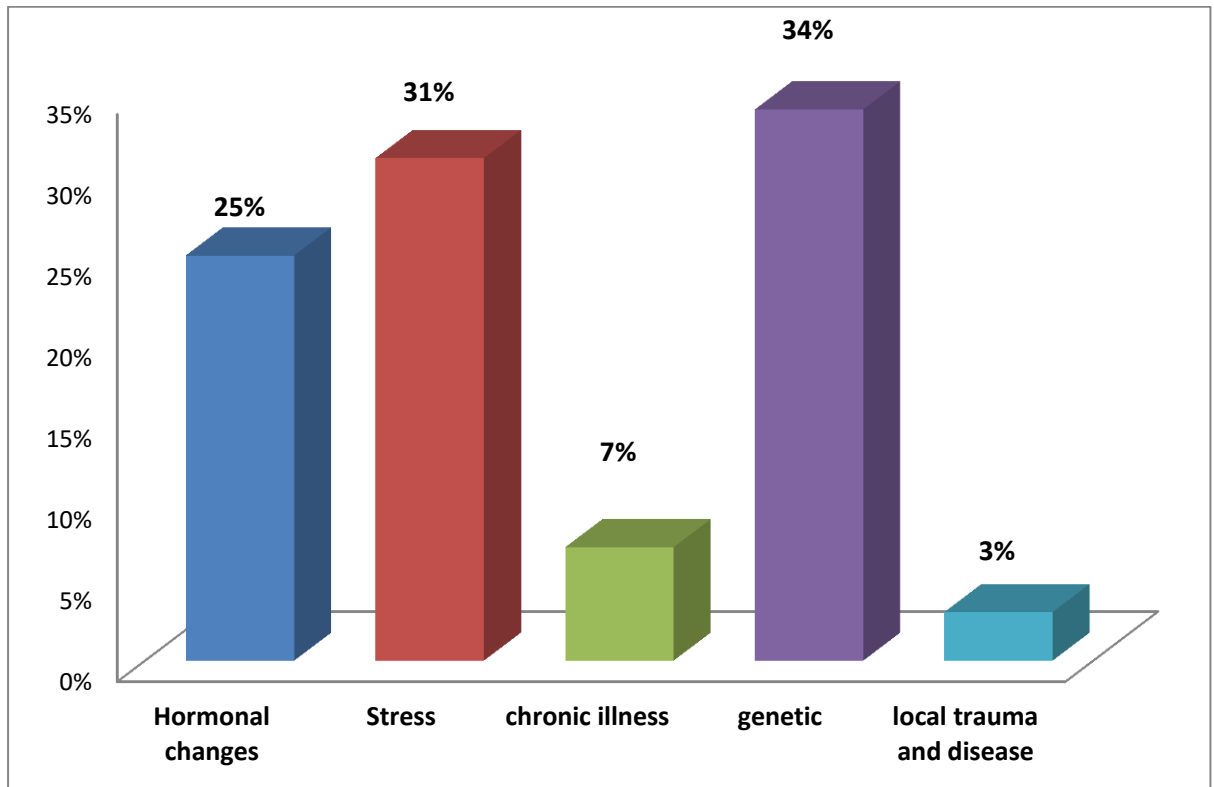


Figure 3: Risk factors of androgenic alopecia.

This figure shows that the genetics is the most risk factors for androgenic alopecia (34%), then stress and hormonal changes (31%), (25%) respectively.

Discussions

The total sample of this study was (210), there is about (33%) of Diyala medical students with androgenic alopecia.

This percentage agree with study was conducted in Jazan medical student, Saudi Arabia [16] that about (32%) with androgenic alopecia.

While in study was conducted in china [17], there is lowest percentage with androgenic alopecia (24%) , that may be due to little risk factors that founded in China and care of China people in hair care more than people in Iraq.

In the present study, the male is most common with androgenic alopecia in percentage from the total sample of study (38%) while female only (27.5%).

Also this percentage approximately same in study was conducted in Jazan medical student, Saudi Arabia [16] and study in china [17], that male is the most common with androgenic alopecia in percentage (33%), (31%) and female (24%), (25%).

In the present study, the stage 6 is the most common stage with androgenic alopecia (32%) flowed by stage 5 and 4 in percentage (22%), (15) respectably .

This percentage agree with study was conducted in Ghaziabad, Uttar Pradesh, India [18] that the stage 6 is the most common stage with androgenic alopecia (35%) flowed by stage 5 and 4 in percentage (26%), (16%) respectably .

In this study, the genetics is the most risk factors for androgenic alopecia (34%), then stress and hormonal changes (31%), (25%) respectively.

Also in study of Medical University Tbilisi, Georgia [19], that the genetics is most risk factors for androgenic alopecia (35%), then stress (29%).

Conclusion

- 1- There is third of Diyala medical students with androgenic alopecia.
- 2- The male is most common with androgenic alopecia than female.
- 3- Sixth stage is the most stage in of Diyala medical students with androgenic alopecia followed by fifth and fourth stage.
- 4- Genetic and stress is the most common risk factors with androgenic alopecia.

Recommendations

We encourage medical students with hair loss to investigate and understand the cause, the type of alopecia, and the available treatments for this condition, which can be physically, psychologically, and socially debilitating.

Because they are the doctors of tomorrow, medical students' health is of the utmost significance. Therefore, early detection and timely intervention have to be done to combat depression, loneliness, and internet addiction in male medical students with AGA.

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