ANDROGENIC ALOPECIA
Aga, Androgenic Balding, Pattern Hair Loss, Pattern Baldness

Hair loss in specific patterns depending on circulating masculinizing hormones in genetically predisposed men and women.

♀ Symptom ♂ Male & Female

About Androgenic alopecia

Androgenetic alopecia (AGA) is a hair loss in specific patterns depending on circulating androgens (hormones which stimulate or control the development and maintenance of male characteristics) in genetically predisposed men and women. Androgenetic alopecia affects 80% of men by the age of 70 years. In women, the incidence of AGA is 2–5% by the age of 50 and the ratio rises to 40% at age of 70. Although the main etiological factors are the same, phenotypic manifestations are different in men and women. Men usually have bitemporal (a receding hairline in the shape of a widow’s peak) and hair loss in the crown (vertex) leading to the complete baldness. In women, frontal hairline is usually preserved and complete baldness does not occur.

Female-pattern hair loss more often causes diffuse thinning without hairline recession; similar to its male counterpart, female androgenetic alopecia rarely leads to total hair loss. Reduction in hair thickness and density leads to a reduction in the overall hair volume (average hair thickness x number of hairs).

Classic male-pattern hair loss begins above the temples and vertex, or calvaria, of the scalp. As it progresses, a rim of hair at the sides and rear of the head remains.

Genetic factors and androgens primarily underlie the pathogenesis of AGA. Hair follicles become gradually miniaturized and spend less time in the active phase (the anagen phase) and more time in the resting phase (the telogen phase) of hair growth.

Furthermore, it is known that dihydrotestosterone (DHT) is a major player in the process. Men with androgenetic alopecia typically have higher 5-alpha-reductase, lower total testosterone, higher unbound/free testosterone, and higher free androgens, including DHT. 5-alpha-reductase converts free testosterone into DHT, and is highest in the scalp and prostate gland. DHT is most commonly formed at the tissue level by 5α-reduction of testosterone. The genetic corollary that codes for this enzyme has been discovered. Prolactin has also been suggested to have different effects on the hair follicle across gender.

There are 4 types of androgenic alopecia pattern and they are designated by letters (Pic. 1):

- Type L, there is no hair loss in the frontal hair implantation line.
- Linear pattern type M, it has the shape of the letter M.
- Type C, it has the shape of the letter C.
- Type U, the frontal line is behind the vertex. It has the shape of a horseshoe or of the letter U. Type U is subdivided into 3 groups, according to the position of the hair implantation line between the vertex and the occipital protuberance.

The specific type (SP) of androgenic alopecia pattern represents the capillary density in certain areas:

- Type F (frontal), decreased hair density across the top area of the scalp, except the anterior line.
- Type V is the rarefaction in the vertex region. Specific types are subdivided into 3 groups, according to the intensity. When the patient presents both types (F and V), both types should be described. The final type is decided by the combination of the assigned basic and specific types.

Other type of classification is Sinclair’s type. The alopecia pattern is divided into four levels of intensity (Pic. 2).
The diagnosis of androgenic alopecia can be usually established based on clinical presentation in men. In women, the diagnosis usually requires more complex diagnostic evaluation. Further evaluation of the differential requires exclusion of other causes of hair loss, and assessing for the typical progressive hair loss pattern of androgenic alopecia. Trichoscopy (a method of hair and scalp evaluation) can be used for further evaluation. Biopsy may be needed to exclude other causes of hair loss, and histology would demonstrate perifollicular fibrosis.

**Enlargement of the prostate**

Enlargement of the prostate, also known as benign prostatic hyperplasia, is a noncancerous increase in size of the prostate. It was once believed that DHT played a role in the development and exacerbation of benign prostatic hyperplasia, as well as prostate cancer, but this has largely been disproven. Both androgenic alopecia and benign prostatic hyperplasia are treated via the inhibition of 5α-reductase activity.

**Prostate cancer**

Prostate cancer is the development of cancer in the prostate, a gland in the male reproductive system. Early onset androgenic alopecia is associated with a significant increased risk of prostate cancer and both have common risk factors (age, high prevalence, genetic susceptibility and association with androgens).

**Diabetes**

Diabetes is a group of metabolic diseases in which there are high blood sugar levels over a prolonged period. Because of its association with metabolic syndrome and altered glucose metabolism, both men and women with early androgenic hair loss should be screened for impaired glucose tolerance and diabetes mellitus II.

**Obesity**

Obesity is a medical condition in which excess body fat has accumulated to the extent that it may have a negative effect on health. There is an increased incidence of insulin resistance and it’s associated disorders of high insulin, obesity, hypertension and dyslipidemia (an abnormal amount of lipids) in men with early onset hair loss. Laboratory tests show that a reduction in sex-hormone-binding-globulin levels (SHBG) and elevated total and/or free testosterone levels lead to hirsutism symptoms, acne and androgenic alopecia.

**High blood pressure**

Hypertension, also known as high blood pressure, is a long term medical condition in which the blood pressure in the arteries is persistently elevated. Both of androgenic alopecia and cardiovascular diseases are related to excess of androgens and secondly, hormonal changes such as hyperandrogenism may play a role in the development of androgenic alopecia and hypertension. Androgenic alopecia may be remarkable in terms of being a cardiovascular disease risk factor.

**Polycystic ovary syndrome (PCOS)**

Androgenic alopecia is associated with an increased risk of PCOS. It is a heterogeneous gynecological endocrine disorder, characterized by chronic anovulation, hyperandrogenism, and hyperinsulinism with insulin resistance, which affects about 6-10% of women in reproductive age and profoundly affects the quality of life of these subjects. In fact, this hyperandrogenic syndrome is frequently characterized by hirsutism, acne, alopecia, obesity, and irregular periods with infertility and it is often treated as cosmetic problem.
The basic forms are represented by the shape of the anterior hair implantation line (L, M, C and U). Specific features relate to the hair density in different areas. The final classification depends on the combination of basic and specific forms.

Male pattern alopecia is divided into four levels of intensity based on the normal scalp to the left.

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