Study of Androgens in Egyptian Females with Androgenetic Alopecia

Thesis

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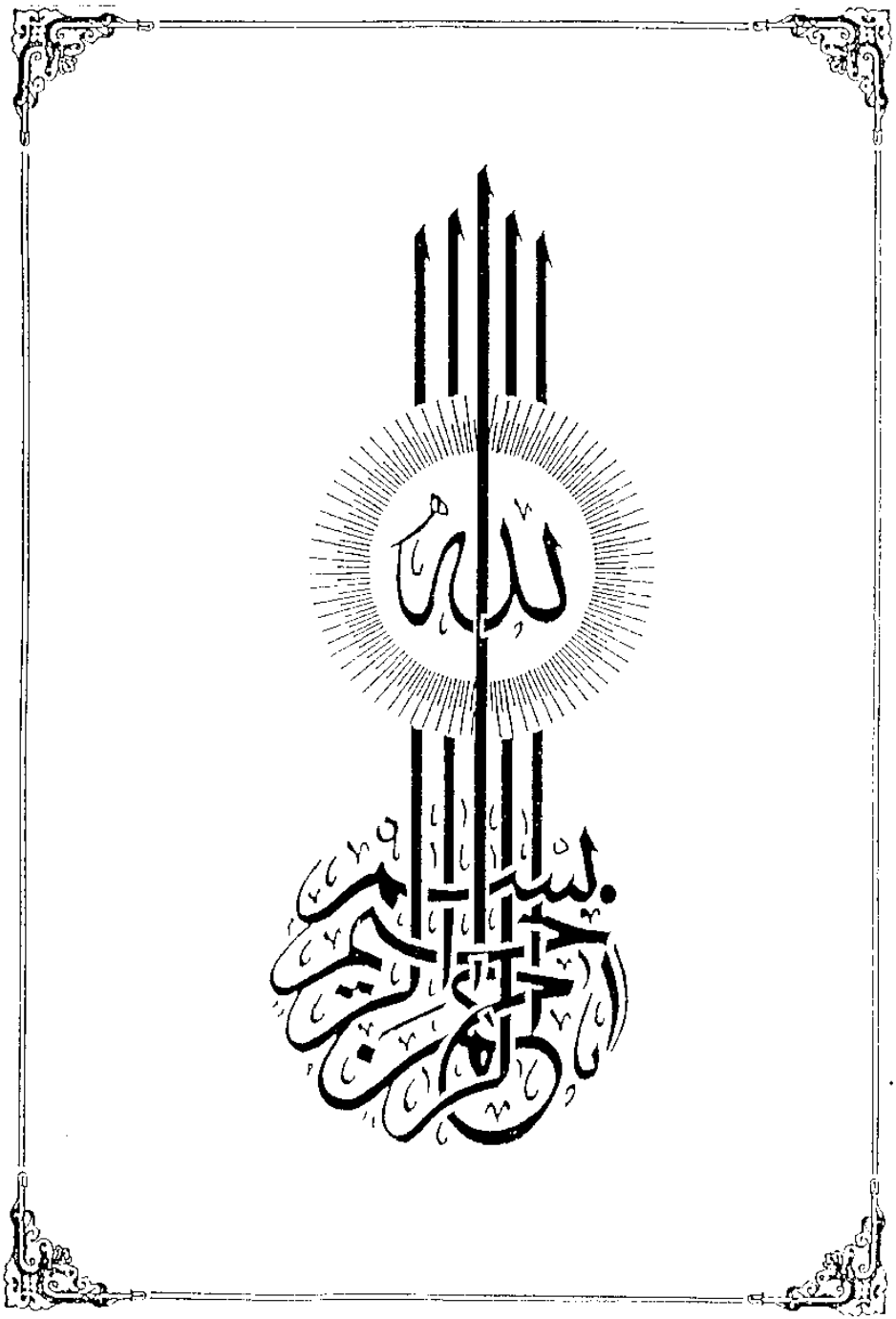

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Introduction and Aim of The Work

Chronic diffuse alopecia is a common problem in females . This state may be brought about by a number of different factors singly or in combination . Some endocrinal disorders , telogen effluvium , chemical agents , nutritional deficiencies and certain severe chronic illnesses may cause this type of alopecia .

The great majority of those females have androgenetic alopecia as the principal or the only defect . Androgenetic alopecia may be induced by androgenic stimulation of hair follicles predisposed to this response by the interdependent influences of genetic factors and of aging .

The availability of radioimmuno assay has permitted accurate direct measurement of circulating androgens .Most reports demonstrated that serum androgen levels in females with androgenetic alopecia show broad variations . The majority of investigators suggested that common baldness in females represents hair loss from the influence of minimal androgen excess on genetically sensitive hairs .

It is recently considered that the hair follicle is not only a passive target for circulating androgens but is capable of processing precursor steroids into potent androgens . Also , it is suggested that androgen receptors may act as regulators of genetically determined hair follicles in androgenetic alopecia .

Review of literature suggested that the epidemiology of androgenetic alopecia , various hair patterns , and the relation between androgenetic

alopecia & different androgen parameters and ratios have not been sufficiently elucidated and need further research .

Aim of Work :-

1- Studing the epidemiology of various hair patterns and androgenetic alopecia in Egyptian females as regards incidence , age distribution etc ... and its association with various hair attributes and cutaneous or systemic diseases .

2- Estimation of serum levels of various androgens and sex hormones to detect any hormonal abnormality associated with androgenetic alopecia in females .

REVIEW OF LITERATURE

Androgens

Definition:

Androgens are substances which possess the ability to maintain the secondary sexual characters of the male (Tanner , 1969).

These compounds are usually steroids that promote masculine secondary sexual characteristics and cause nitrogen retention, thus androgens are defined biologically rather than chemically (Kirschner and Bardin ,1972) As steroid hormones , androgens belong to a heterogenous class of small polycyclic organic compounds . These compounds play a vital role in many developmental and homeostatic processes (O'Malley and Buller ,1977).

Historically , nitrogen retention had been used for determining androgenicity in man . While this assay provides a means of relating the relative potencies of steroids such as testosterone , dihydrotestosterone , and 5αandrostanediols , its lack of sensitivity and precision has limited the evaluation of weaker androgens such as androstenedione , androsterone and Δ5-androstenediol .Androsterone is a moderately good androgen in rats but has essentially no activity in primates (Kirschner and Bardin, 1972).While testosterone is the most active androgen , and the adrenal androgens have less than 20% of its activity (Ganong , 1983 a).

Types

1-Testosterone .(17B-hydroxy-4-androsten-3-one)

Testosterone is a C_{19} steroid with an OH group in the 17th position.It is synthesized form cholesterol , the biosynthetic pathways in all endocrine organs that form steroid hormones are similar (Ganong , 1983 b).
Testosterone is quantitatively and qualitatively a very important androgen secreted in man . It has a multiplicity of functions in the various organs and systems. It is responsible for the development and maintainance of virility in males (Nieschlag and Freischem , 1982).Also there is considerable biologic evidence indicating that testosterone is the most important androgen in women (Kirschner and Bardin , 1972).It is considered the most important in view of its poteney and high circulating levels (Anderson ,1974)
In women the ovaries and adrenal glands contribute equally to the secretion of testosterone , also it is synthesized in non endocrine tissues from several precursors (Bergfeld and Redmond , 1988).

2-Dihydrotestosterone (17β -hydroxy-5 α ndrostane-3 one)

Considerable evidence has recently accrued to indicate that testosterone and androstenedione are converted in some target tissues to dihydrotestosterone , a metabolite which in certain bioassay systems appears to be a very potent androgen (Wilson and Walker , 1969) .It is important to note that the 5α metabolite of testosterone , dihydrotestosterone is a more potent androgen than the parent compound.Dihydrotestosterone is one-and