THE ENDOCRINOLOGY OF GROWTH

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BY

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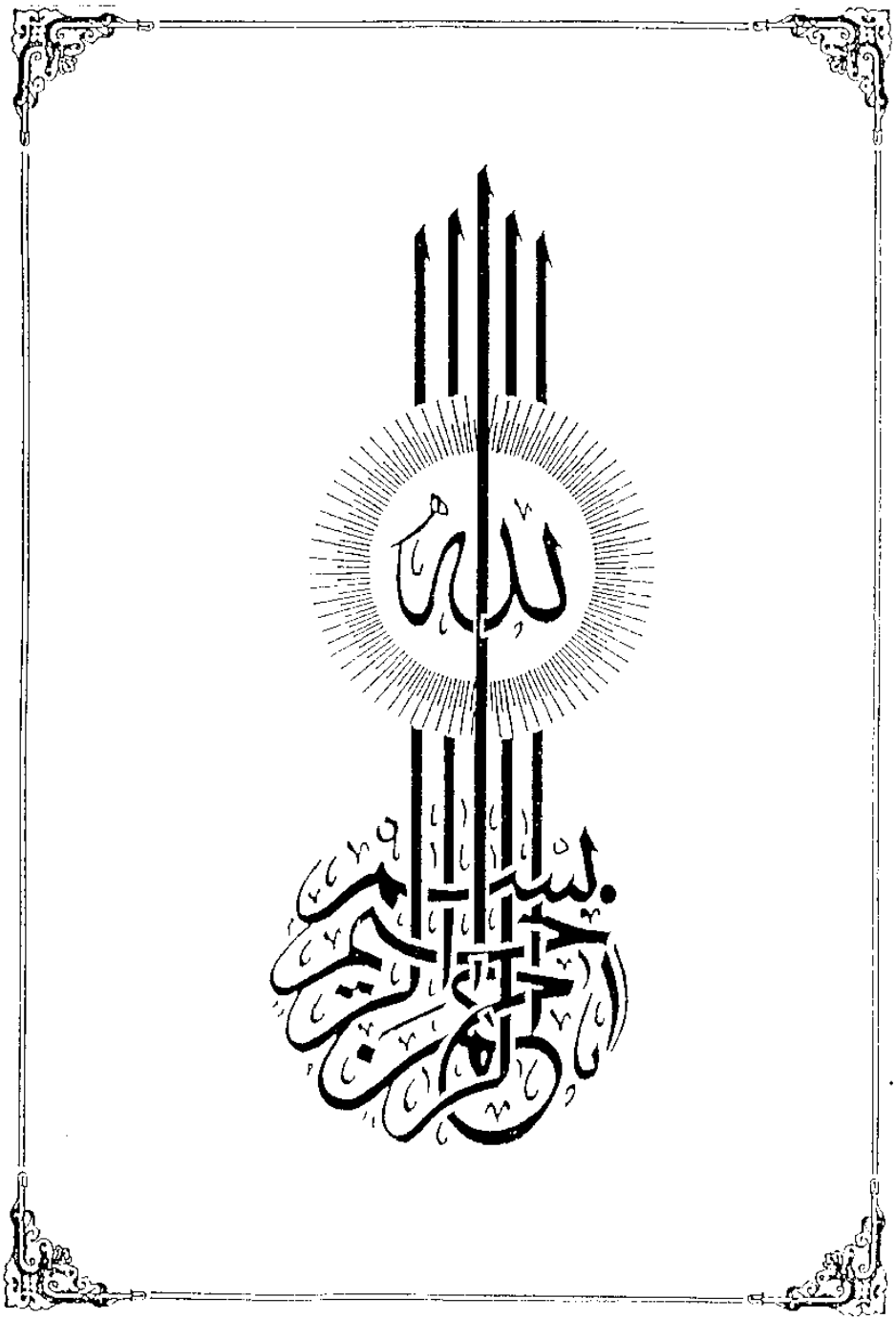

C O N T E N T S

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The endocrine glands have definite effects upon physical and mental growth of the child. Such effects are mediated through hormones which act as regulatory agents for various body functions.

All hormones are primarily involved in the presentation of a stable internal environment and a deficiency of any will in time lead to impaired growth.

Pituitary growth hormone, thyroid hormones and probably insulin have a decisive effect on growth as a whole; but the gonadal hormones and probably certain adrencortical hormones promote growth and bone development only during puberty.

Some hormones such as aldosterone, vasopressin and parathormone play important roles in the maintenance of the appropriate ionic environment for the orderly process of cellular growth and differentiation.

Adolescence is the period of maximun growth in human life subsiding towards the end of adolescence and coming to a standstill with the fusion of the epiphysis. The adolescent growth spurt, the related changes in body composition, the appearance of the

adult secondary sexual characteristics and eventual epiphyseal fusion is apparently due to secretion of androgenic steroids and somatotrophic hormone.

AIM OF THE PRESENT REVIEW

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Is to throw light on the effect of different hormones on growth which is best illustrated by reviewing the variable clinical syndromes that result from their deficiency or excess and it is also vital to review the hormonal aspect of adolescence which is one of the periods of maximum growth in human life.

REVIEW OF LITERATURE

GROWTH

Definition :

Growth is the natural increase in size of the individual i.e. weight, height and head circumference due to increase in size and multiplication of the cells and increase in the intracellular substances. So the child is not a mini adult but a growing and developing organism (Abbassy et al.,1972).

Factors affecting growth and development :

1- Genetic factors:

The genetic control operates throughout the whole process of growth (Forfar and Arneil,1978).

The genes influence growth and development through control of the production of enzymes needed for all the chemical reactions that are necessary for building up and maturation of various cells and systems. The influence of genes on growth and development is manifested in cases of inborn errors of metabolism (Alterberg, 1957).

The genes have an effect on the height of children (Wilson, 1979).

The prepubertal stage of growth appears to be mainly environmentally determined,while growth during adolescence is mainly genetically determined (Rona, 1981).

Each parent furnishes a complete set of genes for the proper construction of the new individual (Abbassy et al.,1972). The high correlations between parents and their children are for example interpreted as the effect of genes on human growth (Rona,1981).

The chromosomal pattern exerts a definite influence on birth length, so chromosomal anomalies lead to intrauterine growth retardation which cause failure to thrive (Reisman, 1971).

2- Socio-economic factors :

Socioeconomic factors are of great importance in determining the physical status of children. Chidren from different socio-economic levels differ in average body size at all ages (Abbassy et al.,1972). The

causes of socio-economic differences are multiple and complex; difference in nutrition and habits of regular meals, sleep, exercise and general organization which distinguish a good home from a bad one. The growth differences are more related to home conditions than to economic conditions of the families (Forfar and Arneil, 1978).

Children of higher social class are taller two centimeters more than those of lower social class till the age of three years and five centimeters till the adolescence, while in weight the difference is less. Children of lower social class have a greater weight for height due to relative breadth of bones and muscles and more fat (Rhodes, 1969).

Comstock et al.,(1971) observed that there is no relation between the frequencies of low birth weight infants and the indices of adequate housing or the location of the family in an urban or rural area.

Abed, (1980) divided a sample of healthy Egyptian 200 newborns under different socio-economic conditions. The results which were obtained from

this study showed that the effects of socio-economic factors are well apparent on bone growth as represented by length, bicristal and biacromial diameters and on body weight and head circumference; but this factor does not effect fat and muscle components of the body.

The latest studies indicate that up to the age of ten years there is no association between social class and obesity, but that ffom the age of eleven years obesity starts to be more frequent in lower social class especially in girls (Rona, 1981).

3- Racial factor :

The racial difference seen in adult body built depend on the genetic control, climatic differences and on nutritional states. There is close positive relationship between linearity of peoples and the mean annual temperature where they live (Forfor and Arneil, 1978).

Abbassy et al. (1972) stated that it is imposible to disentangle the influence of race on growth from the effects of nutritional and Socio-economic differences. Children living in tropical regions show retarded