ANDROLOGICAL PROBLEMS IN GUT DISEASES

THESIS

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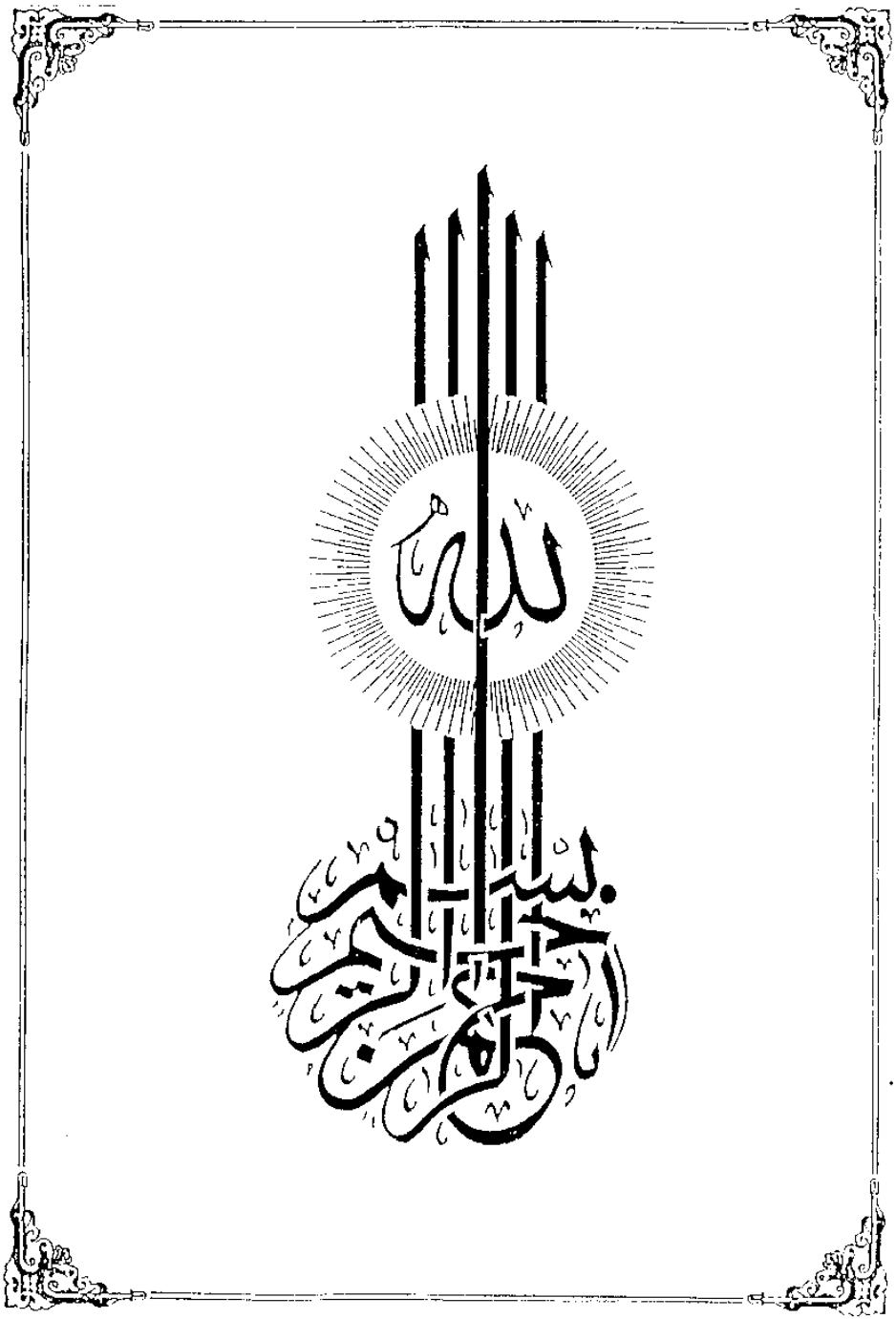

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CONTENTS

INTRODUCTION AND AIM OF THE WORK

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Introduction :-

The gut literally means the intestine and scientifically means the gastrointestinal tract.

Andrological anomalies have become known in several gut diseases (Szarvas , 1983). These gut diseases may be congenital , inflammatory or even neoplastic . On the other hand these andrological problems may be in the form of impairment of the seminal quality , hormonal changes , hypogonadism , sexual inadequacy and the resulting infertility . Gut diseases can affect the male reproductive system by themselves , unfortunately by the medications used in their treatment or even by the operative procedures done for their radical treatment . We , also , have to put in mind that the general ill health , the nutritional deficient status and the superimposed (stressed) psychological status are considered as cofactors being associated with many of the chronic gut diseases .

In this work , not every gut disease (or its treatment either medical or surgical) will be found to cause an andrological side effect .

Impaired semen quality will be found in the form of reduced sperm density , motility and increased number of abnormal forms resulting in reduction of fertilization efficiency of the semen obtained from patients with gut disease .

Hormonal changes will be found in the form of either raised or lowered serum sex hormonal level . Several hypothalmic pituitary gonadal hormonal disturbances will be presented .

Hypogonadism , delayed puberty and immature secondary sexual characters are also presented . Even feminine characters in the form of gynaecomastia has been also found . Different forms of sexual inadequacies are found in the form of diminished libido , erectile impotence and ejaculatory disturbances. The resulting borderline fertility , subfertility and even infertility are reviewed .

Aim Of The Work

The aim of this work is to review the literature concerning the andrological problems facing the gut male patients through covering male reproductive functions in regard of semen quality, hormonal status and sexual functions . Our aim is to define these problems in order to make all andrologists keep in their minds that some gut diseases and/or their management can affect male reproductive function in different ways . Also , our aim is to make gastroenterologists put in their minds that the disease itself , its drug therapy or its surgical treatment could affect their patients' reproductive power by different means .

Gastroenterologists . also , have to know that , proper managing of some of these gut diseases or changing the drug therapy to a more safe drug free from andrological side effects ,will save their young male patients and allow them to have fertile marriages and adequate sexual relationships .

REVIEW OF LITERATURE

PHYSIOLOGY
OF
MALE REPRODUCTIVE SYSTEM

Physiology Of The Male Reproductive System

The reproductive functions of the male can be divided into three major subdivisions : first , spermatogenesis ; second , performance of the male sexual act ; and third regulation of male reproductive functions by the various hormones (Guyton , 1986) . The testis performs two basic functions exocrine production of spermatozoa and endocrine secretion of androgenic hormones , primarily testosterone (Steinberger and Steinberger , 1974) .

Spermatogenesis

Spermatogenesis occurs in all the seminiferous tubules during active sexual life begining at an average age of 13 years as the result of stimulation by anterior pituitary gonadotropic hormones and continuing throughout the remainder of life (Guyton , 1986) . The spermatogenic cells are arranged in an orderly manner from the basement membrane to the lumen . Spermatogonia lie directly on the basement membrane , and next to them , progressing centrally are found primary spermatocytes , secondary spermatocytes (rarely seen because they have a short half-life)

, and spermatids . Within these broad groups at least 13 recognizable germ cell types have been identified in the human testis : dark type A spermatogonia (Ad) ; pale type A spermatogonia (Ap) ; type B spermatogonia (B) ; preleptotene primary spermatocytes (R) ; leptotene primary spermatocytes (L) ; Zygotene primary spermatocytes (Z) ; pachytene primary spermatocytes (P) ; secondary spermatocytes (II) ; and spermatids Sa , Sb1 , Sc , Sd and Sd2 .

In sperm maturation the most primitive undifferentiated spermatogonia are the stem cells . In the process called stem cell renewal , these primitive cells must be constantly replenished . It is believed that when AP spermatogonia undergo mitotic division , two populations of cells can be produced : (1) Other type AP spermatogonia that will replenish the stock of primitive stem cells , and (2) Type B spermatogonia that will differentiate into spermatozoa .
Through a series of mitotic divisions , the type B spermatogonia differentiate into pachytene primary spermatocytes .

The primary spermatocytes undergo the first maturation division by a process of meiosis , giving rise to two secondary spermatocytes .

Each secondary spermatocyte divides to form two spermatids , thereby reducing the number of chromosomes from 46 to 23 . The spermatid does not undergo further division but matures into a spermatozoon (Clermont , 1972) .

The time necessary to produce a spermatozoon from a pale type A spermatogonia is 74 days (Heller and Clermont , 1964) .

The metamorphosis of the spermatid to the spermatozoon is termed spermiogenesis and involves the following changes :

- Gradual condensation and reduction in the volume of the nucleus
- Formation of the acrosome by the Golgi complex .
- Formation of the axial filament at the abacrosomal pole .
- Gradual reduction of the cytoplasm and its final shedding as the residual body .
- Formation of the middle piece by the mitochondria .

Finally , the release of mature spermatids from the epithelium is termed spermiation and propably involves an active process by the Sertoli cells (de Krester , 1969)

Guyton (1986) , stated that several hormones play absolutely essential roles in spermatogenesis . Some of these are :

1- Testosterone that is essential for one or more steps of spermatogenesis , propably exciting specially the meiotic division of the primary spermatocytes to form secondary spermatocytes .

2- Luteinizing hormone (LH) that stimulates the Leydig cells to secrete testosterone .

3- Follicle stimulating hormone (FSH) which stimulates the Sertoi cells in order to serve in the conversion of the spermatid to sperm .

4- Estrogens which are probably essential for the spermiation .

5- Growth hormone , as well as most of the other hormones , is necessary for the metabolic functions of the testis . Growth hormone specially promotes early division of the spermatogonium itself .

Sertoli Cells :-

The Sertoli cells have several functions : maintenance of the blood - testis barrier ; secretion of the testicular fluid and androgen binding protein ; and participation in the process of spermiation .