The Psychological Aspects of Infertility

Thesis

Submitted in partial fulfilment
of Master Degree
in Dermatology and Venereology

By

Maged Nabih Kamel
M.B., B.Ch.

Supervised By

Prof. Dr. Mostafa Mokhtar Kamel
Professor of Dermatology and Venereology
Faculty of Medicine - Ain Shams University

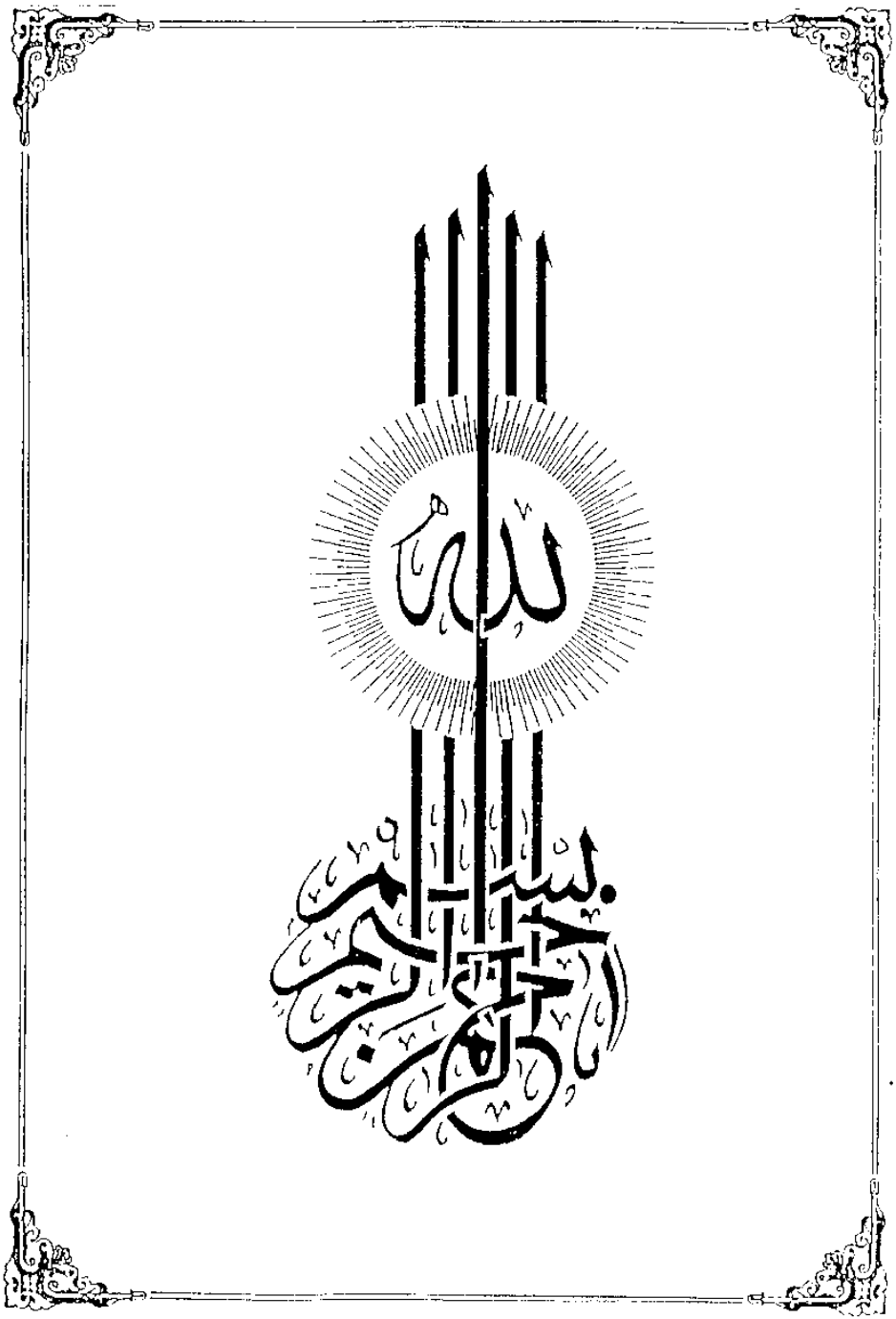
Dr. Hassan M. Amin Riad
Lecturer in Dermatology and Venereology
Faculty of Medicine - Ain Shams University

Faculty of Medicine
Ain Shams University
1994

Acknowledgements

I am grateful to Professor Dr. Mostafa Mokhtar Kamel, Professor of Dermatology and Venereology, Ain Shams Faculty of Medicine, and to Dr. Hassan M. Amin Riad, Lecturer in Dermatology and Venereology, Ain Shams Faculty of Medicine, for their constant support and encouragement, fruitful guidance and advice, and constructive criticisms throughout this study. Without their great help this work would not have been completed.

Maged N. Kamel



Contents

List of figures

List of tables

Abbreviations

5-HIAA	5-hydroxyindole-3-acetic acid
5-HT	5-hydroxytryptamine (serotonin)
ABP	Androgen-binding protein
ACTH	Adrenocorticotrophic hormone
AID	Artificial insemination—donor
AIH	Artificial insemination—husband
AMP	Adenosine monophosphate
ATP	Adenosine triphosphate
BBT	Basal body temperature chart
CLIP	Corticotrophin-like intermediate lobe peptide
CNS	Central nervous system
CRH	Corticotrophin-releasing hormone
CSF	Cerebrospinal fluid
DDT	Dichloro-diphenyl-trichloroethane
DES	Diethylstilboesterol
DHT	Dihydrotestosterone
DOPA	3,4, dihydroxy-2-phenylalanine
DSM-III-R	Diagnostic and statistical manual of mental disorders, 3rd edition, revised
E_2	Oestradiol
EMG	Electromyography
FSH	Follicle-stimulating hormone
GABA	Gamma-aminobutyric acid
GIFT	Gamete intrafallopian transfer
GnRH	Gonadotrophin-releasing hormone

HCA	Heterocyclic antidepressants
HIV	Human immunodeficiency virus
IUI	Intrauterine insemination
IVF	In vitro fertilization
LH	Luteinizing hormone
LPD	Luteal phase defect
LPH	Lipotrophic hormone
MAO	Monoamine oxidase enzyme
MSH	Melanocyte-stimulating hormone
NK	Natural killer cell
NPT	Nocturnal penile tumescence
NPY	Neuropeptide Y
P	Progesterone
PIH	Prolactin-inhibiting hormone (dopamine)
PMS	Premenstrual syndrome
POMC	Pro-opiomelanocortin
RNA	Ribonucleic acid
SHBG	Sex hormone-binding globulin
T	Testosterone
TSH	Thyroid-stimulating hormone

I. Introduction

Unlike some diagnoses, infertility has definite medical and psychological components, which are inseparable (1). Awareness of the importance of the psychological aspects of infertility has led to the creation of the Psychological Special Interest Group within The American Fertility Society (2). The aim of this work is to present the psychological and sexual aspects of infertility, and related psychoneuroendocrine mechanisms.

Infertility can be defined as the failure to conceive after one year of unprotected intercourse of appropriate frequency. It is estimated that about 15% of newly married couples experience difficulty in bearing children (3-6). Considering the large fraction of the entire population falling into this group, infertility should be looked upon as a major public health problem.

Infertility is a problem of two persons in one unity: the husband and the wife, rather than of the sick half of a couple (4). Both husband and wife are involved in conception, and the inability to conceive constitutes a problem for both. Infertility may be due to additive simultaneous male and female causes, or improper male/female interaction at microscopic levels (sperm/cervical mucus and sperm/oocyte interactions). But even when the cause of infertility is localized in one partner, the other partner is likely to suffer of being deprived of parenthood. This in turn may be reflected on the couple's fertility index, decreasing it further and affecting treatment outcome.

In this work, the concept of managing an infertile couple is adopted in dealing with involuntary childlessness. In nearly each topic of the study, both the male and the female sides and their interactions are presented.

The motives for parenthood

In order to appreciate the psychological and sexual significance of infertility, one first needs to consider why it is important or desirable to have children.

Among the most important motivations for parenthood is the generative urge. In 1963, Erikson defined 'generativity' as the human need to take care of a child and be responsible for its upbringing. Generativity implies a primary interest in establishing and guarding the next generation. Erikson stated that this interest emerges at a certain stage of psychosocial maturity beyond young adulthood. (7)

Gender (sex) differences exist in the way men and women view parenthood. Men may not feel the need for children as intensely as some women do; boys are not as likely to grow up thinking of themselves primarily as fathers, and the woman's loss of being pregnant is not experienced by men (1).

However, some men link fatherhood and fertility to masculinity, and the sense of immortality that children provide their parents with (as they bear the family name) is important for many, and may be manifested by the pressure that older parents put on their adult children to give them grandchildren (8). The desire for marital completion is another prominent motive for parenthood in men (9).

Women—in contrast to men—have been traditionally raised to view motherhood as their primary adult role (10). Many women consider parenthood their principal means of fulfiling gender-role requirements and self-identity, and subsequently may show poor adjustment to infertility (9).

The religious, cultural, and social exhortations to multiply and replenish the earth with offspring are other important motives, especially in traditional and conservative oriental communities. References to fecundity date back to ancient writings about the gods and goddesses of fertility. Childless people may feel disgraced, inferior, humiliated, and ashamed of being infertile, and marriages may break in consequence; the fertile partner may remarry to fulfil his/her drives for parenthood. (11)

However, there is a general shift towards a preference for two-children families and an increase in voluntary childlessness these days. In the western world, people are now questioning whether it is pathological not wanting any children?! While in the past (and still till now in rural Egypt), children were seen as a material resource and later on a support for their ageing parents, they are now widely regarded as a major expense. (8)

The increased availability of alternative social roles nowadays for educated women is another social factor to be considered. Whereas being a mother was a prominent and major expectation and ambition for most women in the past, it is now competing with other potentially rewarding social roles (success in different careers, academic achievements, etc.). But motherhood will remain one of the most powerful sources of self-esteem for most women. (8)

Moreover, the increasing opportunity for human beings to separate off the pleasure of sexual activity from its reproductive function, aided by changes in sexual mores and improvement in contraceptive technology has contributed to the increase in voluntary childlessness in the western world. Voluntarily childless couples appear to be more successful and happier in their careers, and they do not appear to be more (or less) selfish or immature than other couples! Nor are they more materialistic. These persons are usually more independent, self-reliant, and less easily influenced by parents or others. (7)

However, involuntary childlessness remains a very distressing experience for many other good couples who want children, and this will be the central theme of this work.

II. The limbic-hypothalamic-pituitary-gonadal axis and psychoneuroendocrine integration

Psychoneuroendocrinology studies the relationships between the hormonal system and the central nervous system, and the behaviours that modulate and are derived from both. The neuroendocrine axes (e.g., adrenal, thyroid, and gonadal axes) start in the hypothalamus where they receive input from the cerebral cortex and limbic system, and end in the target endocrine glands. The tissues affected by the hormones and modulators produced by these axes are the ultimate targets. Each component in the neuroendocrine axes can feed back onto any of the other components, including the cerebral cortex and limbic system. An evidence for this psychoneuroendocrine interaction is derived from the observations of psychiatric abnormalities in endocrine disorders and endocrine disturbances in psychiatric syndromes. (12, 13)

Basic physiological principles of neuroendocrinology

Hormones and neurotransmitters are chemical messengers and modulators. In the classical concept, hormones are products of endocrine glands and are transported in the blood stream to reach target tissues, while neurotransmitters are neuronal products that help establishing communication between neurons in the nervous system and propagation of impulses. (14)

However, this traditional distinction between hormones and neurotransmitters is becoming increasingly blurred. The brain, in many ways, acts as an endocrine organ itself (endocrine neurons), and the substances

traditionally considered hormones may have modulatory effects on neurotransmission when released into a synapse. (8, 15)

There are three main chemical types of hormones: protein or polypeptide hormones (e.g., ACTH, β-endorphin, gonadotrophins, and prolactin), steroid hormones synthesized from cholesterol (e.g., cortisol, oestrogen, and testosterone), and amino acid derivatives (e.g., thyroxine and norepinephrine synthesized from tyrosine amino acid, and melatonin derived from tryptophan amino acid). (16)

Steroid hormones are stored—to some extent—in the blood bound to plasma proteins (SHBG–sex hormone binding globulin, and albumin). Only a little amount of the hormone is available at any time in the free form in the plasma, and this represents the biologically active fraction of the hormone. The unbound or free form of plasma testosterone for example accounts for only 2% of total plasma testosterone. (17)

Peptide hormones, on the other hand, are stored in the cell or gland which makes them and released when required, often in a pulsatile fashion. Consequently and in contrast to steroids, their level in the blood may fluctuate considerably or may only be detectable for a brief period after release. Peptide hormones may also play the role of neurotransmitters. (18)

When specialized receptor molecules combine with their specific ligands (agonists), an agonist-receptor complex is formed that triggers a sequence of biochemical events resulting in the expression of the specific effects of the ligand on the cell. Such triggering may be by opening ion channels in cell membrane, leading to an action potential or increasing cytoplasmic Ca^{2+} and influencing intracellular processes. On