Growth Hormone Releasing Factor Blood Levels in Children with Short Stature

THESIS

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The Master Degree in Pediatrics

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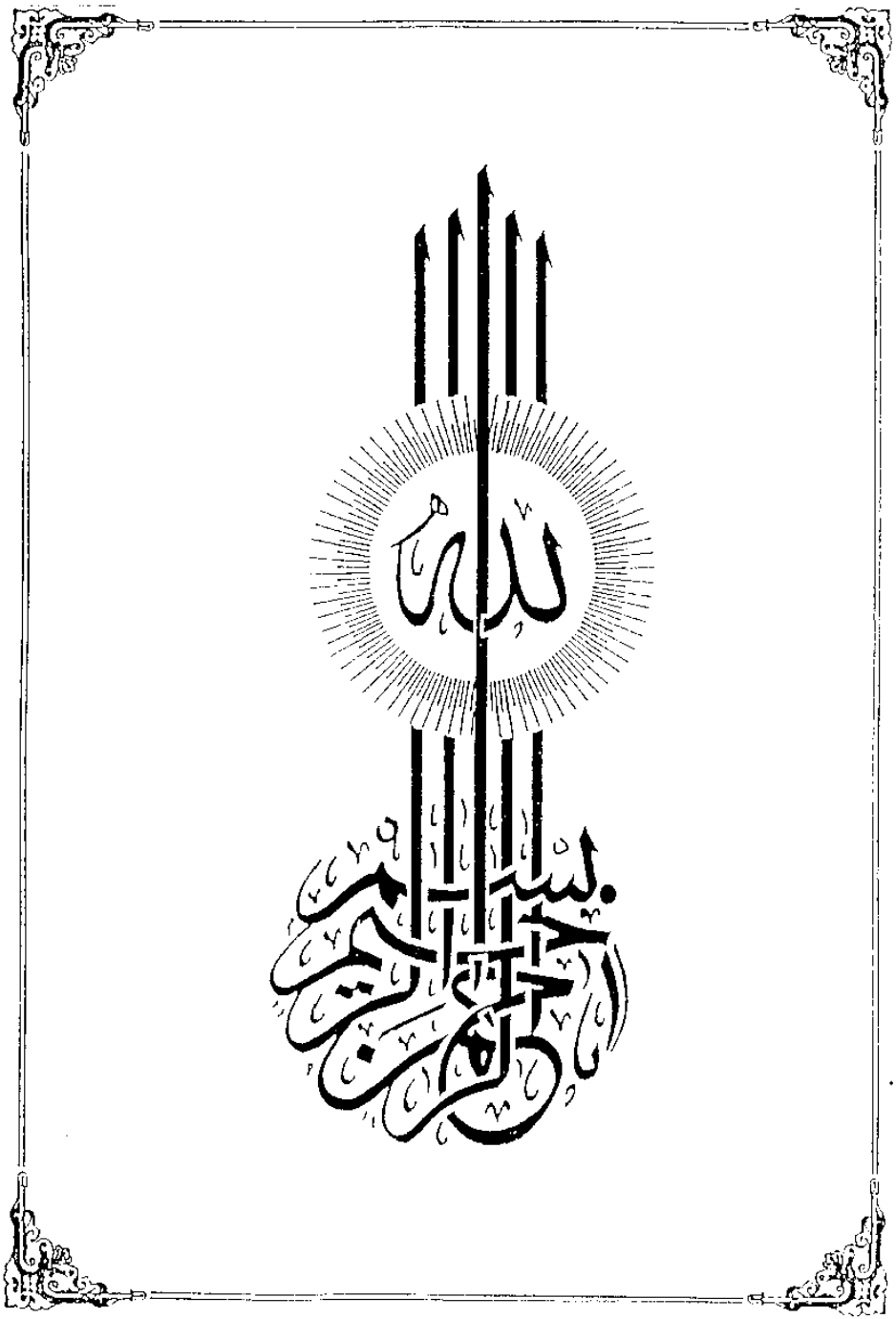
بسم الله الرحمن الرحيم

«وما أوتيتم من العلم إلا قليلاً»

(صدق الله العظيم)



To My Parents

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Sabah Mohamed

Contents

List of Tables and Figures

List of Abbreviations

ATP sensitive K+	Adenosine triphosphate sensitive potasium
B.A	Bone age
Ca2+	Calcium
C.A	Chronological age
CRH	Corticotropin releasing hormone
CSF	Cerebrospinal fluid
EASIA	Enzyme Amplified Sensitivity Immunoassy
Fc	Fraction crystalizable
GH	Growth hormone
GHD	Growth hormone deficiency
GHRH	Growth hormone releasing hormone
GHRP	Growth hormone releasing peptide
G.V	Growth velocity
hGH	Human growth hormone
HPLC Grade	High purification low concentration grade
IGF1/sm-c	Insulin - like growth factor 1 / somatomedin-c
ISGHS	Inadequate spontaneous growth hormone secretion
Labs	Laboratories
L-dopa	Levo-dopamine
Mabs	Monoclonal antibodies
Min	Minute
pit	Pituitary
REM	Rapid eye movement

RIA	Radio immunoassay
SRIF	Somatotropin release inhibiting factor
T4	Thyroxine hormone
TSH	Thyroid - stimulating hormone

CHAPTER I

Introduction & Aim of the Work

Introduction and Aim of the Work :

The endocrine and nervous systems regulate almost all metabolic and homeostatic activities of the organism and determine the pace of growth and development. The two regulatory systems interact : the rate of most endocrine secretions is influenced directly or indirectly by the brain, and virtually all hormones can influence brain activity **(Reichlin, 1992)**.

In 1982, the predicted presence of growth hormone releasing hormone (GHRH) was confirmed when it was isolated from two patients with pancreatic islet cell adenomas subsequently. It is estimated that 75% of all children with growth hormone deficiency (GHD) have GHRH deficiency rather than GHD with intact and responsive pituitary glands **(Arslanian, and Kalhan, 1992)**.

Aim of the Work :

To evaluate plasma levels of GHRH following stimulation in children with GH deficiency and to determine the value of this measurement in localizing the abnormality in GH secretion at either the hypothalamic or pituitary levels.

CHAPTER II

ANATOMY

The Hypothalamic - Pituitary Unit :

Pituitary function depends on hypothalamic neurosecretion; the anatomical organization of the hypothalamic pituitary unit reflects this close relationship. The pituitary is divided into three clearly defined lobes : The anterior lobe (also called the adenohypophysis, the pars distalis, or the pars glandularis), the neural lobe (also called the posterior pituitary or the infundibular process), and the intermediate lobe (also called the pars intermedia). **(Reichlin, 1992)**.

The neurohypophysis includes the neural stalk, the neural lobe, and the specialized neural tissue at the base of the hypothalamus forming the crucial region for the transfer of pituitary - regulating neurosecretions to the anterior pituitary. The neurohypophyseal porition of the hypothalamus (which forms the base of the third ventricle) looks like a funnel. This resemblance is so striking that Vesalius, who first described these structures, propsed that the infundibulum (funnel) drained cerebrospinal fluid (CSF) as pituita (mucus) through the pituitary gland into the nose.

The central region of the base of the hypothalamus forms a-mound (called the median eminence of the tuber cinereum)

from which the pituitary stalk arises. It is enveloped from below by a delicate anterior extension of anterior pituitary tissue termed the pars tuberalis (**Reichlin, 1992**).

Blood Supply :

The anterior pituitary is the most richly vascularized of all mammalian tissues, receiving 0.8 ml/g/min from a portal circulation connecting the median eminence of the hypothalamus and the anterior pituitary. Arterial blood is supplied from the internal carotid arteries via the the superior, middle, and inferior hypophysial arteries.

The hypophysial - portal system of capillaries allows control of the anterior pituitary function by the hypothalamic hypophyseotropic hormones secreted into the portal hypophysial vessels. There may also be retrograde blood flow between the pituitary and hypothalamus, providing a possible means of direct feed back between pituitary hormones and their neuroendocrine control (**Tyrrell et al., 1994**).

CHAPTER III

SHORT STATURE