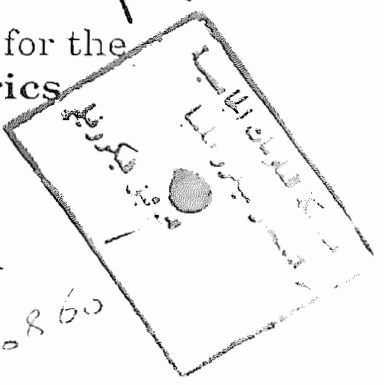
URINARY GROWTH HORMONE EXCRETION AS A SCREENING TEST FOR GROWTH HORMONE DEFICIENCY

THESIS
Submitted in partial fulfillment for the Degree of (M.Sc.) in **Pediatrics**



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بسم الله الرحمن الرحيم

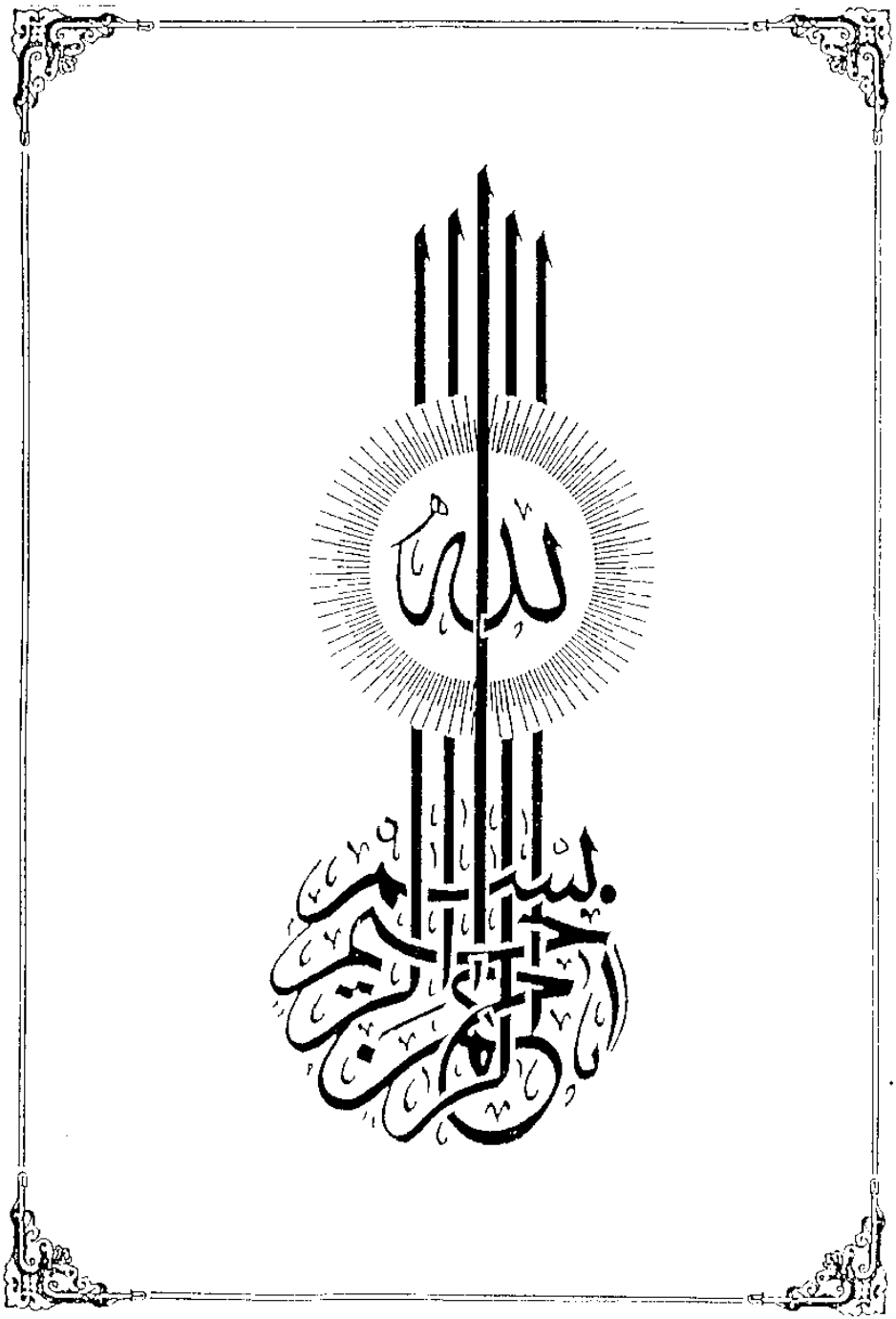
اقرأ باسم ربك الذي خلق

خلق الإنسان من علق

اقرأ وربك الأكرم الذي علم بالقلم

علم الإنسان ما لم يعلم

العلق ١-٥



To My Mother

Acknowledgement

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ABBREVIATIONS

ALL	Acute Lymphoblastic leukaemia
GABA	Gamma amino butyric acid
GH	Growth hormone
GHBP	Growth hormone binding protein
GHD	Growth hormone deficiency
GHRH	Growth hormone releasing hormone
GF-1	Insulin like growth factor 1
GFBPs	Insulin like growth factor binding proteins
GHD	Isolated growth hormone deficiency
nRNA	Messenger RNA
ND	Neurosecretory dysfunction
TBI	Total body irradiation

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INTRODUCTION AND AIM OF WORK

NTRODUCTION

Secretion of growth hormone (GH) from anterior pituitary gland is pulsatile nd greatest during slow wave sleep. Screening tests for growth hormone leficiency in current use are based on this observation and therefore require vernight tests. Alternatively secretion during the day can be stimulated by drugs Walker et al., 1990).

Pharmacological stimulation was found to underestimate spontaneous GH ecretion in 10-20% of children (Donaldson et al., 1991).

Both types of tests require repeated blood sampling, are time consuming, xpensive and above all are unpleasant and potentially dangerous. An alternative vould be the measurement of urinary growth hormone concentration which would ssess integrated growth hormone secretion (Walker, 1990).

AIM OF THE WORK

The aim of the study is to derive a reference range for urinary growth hormone, to validate the assay and to establish correlation between urinary GH excretion and serum GH after provocation.

REVIEW OF LITERATURE

PITUITARY GLAND

Embryology

The pituitary gland is formed in fetal life from two separate sources. The anterior and intermediate lobes of the pituitary arise in the embryo from Rathke's pouch, an evagination from the roof of the pharynx.

The posterior pituitary arises as an invagination of the floor of the third ventricle. It is made up in large part of the endings of the axons that arise from cell bodies in the supraoptic and para-ventricular nuclei and pass to the posterior pituitary via the hypothalamo-hypophyseal tract (Kaplan, 1990).

The blood supply of the anterior pituitary consists of a systemic arterial supply, a portal blood system and a venous drainage system. The arterial supply is derived from the superior hypophyseal artery, a branch of the internal carotid artery.

The venous portal system originates from specialized straight terminal arterioles in the median eminence, from which blood is collected in a series of parallel veins coursing down the anterior surface of the pituitary, and terminating in the sinusoidal capillaries of the adenohypophysis. This portal system has come to be recognized as the pathway by which hypothalamic releasing and inhibiting substances are transmitted to the anterior pituitary (Kovacs and Horvath, 1990).

The nerve supply of the anterior lobe is limited to fine nerves derived from the carotid plexus that accompany the arteriolar branches (Besser,1977).

Sympathetic nerve fibers reach the anterior lobe from its capsule, and parasympathetic fibers reach it from the petrosal nerves, but very few nerve fibers pass to it from the hypothalamus. The nerve fibers may affect adenohypophyseal blood flow but play no direct role in the regulation of adenohypophyseal hormone secretion. The posterior lobe is richly innervated via the hypophyseal stalk by the supraopticohypophyseal and tuberohypophyseal tracts (Kovacs and Horvath, 1990).