AIN SHAMS UNIVERSITY
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Urodynamic Studies in Normal Pregnancy

A Thesis
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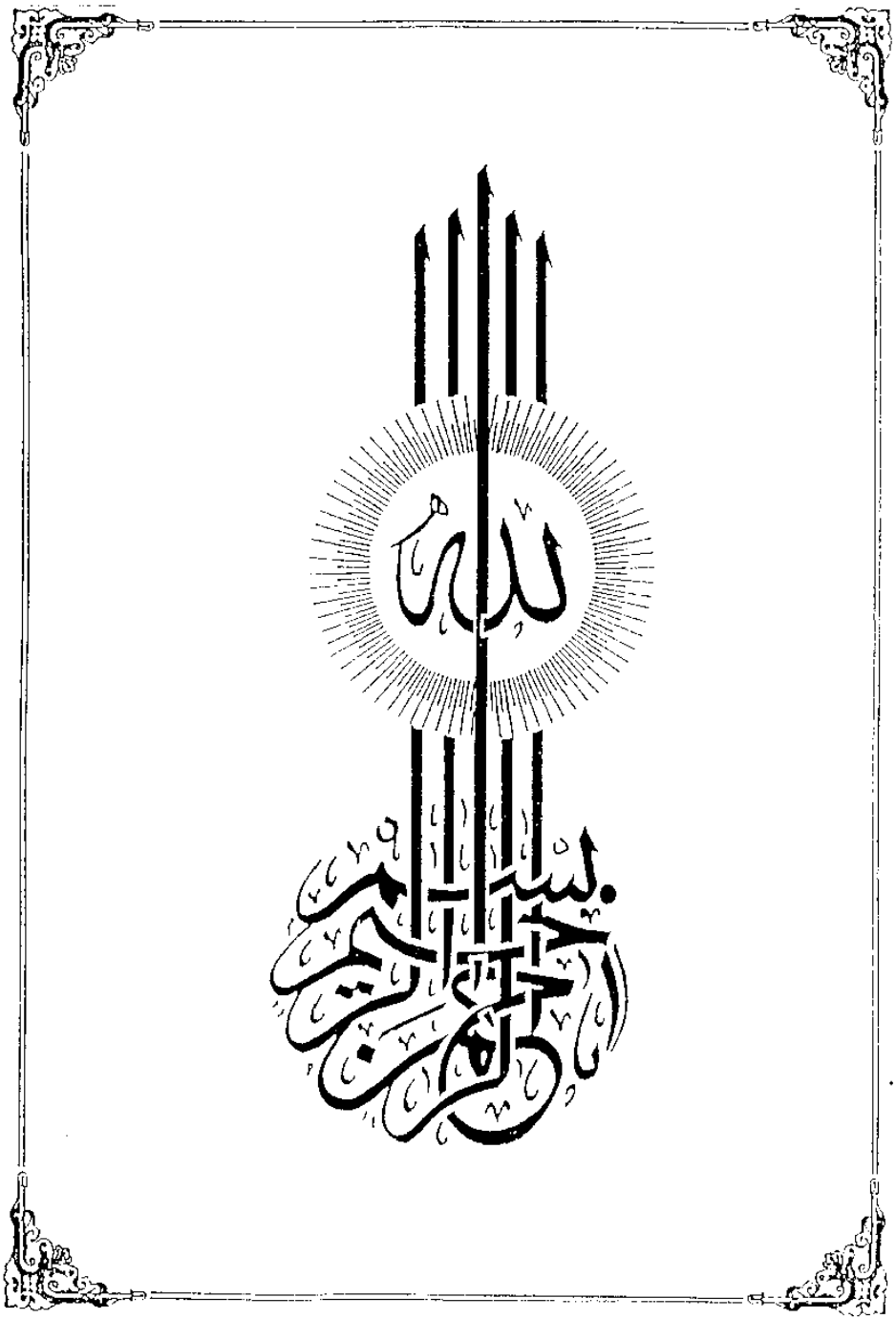

ACKNOWLEDGMENT

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TO...

MY FAMILY

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INTRODUCTION

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The anatomic relationship of the genital and urinary tracts is intimate because of their common embryologic origin. Thus, conditions affecting one system exert an influence on the other. Pregnancy which is the most common genital tract condition in the female is associated with substantial morphologic change in the urinary tract *(Pitkin, 1993)*.

Urodynamic studies in nulliparous women in normal late pregnancy has documented gestational changes in the lower urinary tract function. Urethral length both absolute and functional increases during late pregnancy. Maximal urethral pressure increases by an average 23 cm H2O compared with a mean increase in bladder pressure of only 11 cm H2O, leading to greater urethral closure pressure during pregnancy. These two effects namely increased urethral length and elevated urethral closure pressure tend to promote continence *(Iosif et al., 1980)*.

It has long been observed that pregnancy brings about a predisposition to such urinary disorders as stress incontinence and bladder retention. The physiology of the bladder during pregnancy was interpreted as early as (1938) by Mullner. However, studies establishing a connection between pregnancy and stress incontinence were first conducted in (1959) by Francis who found stress incontinence in 67% of pregnant women *(Iosif et al., 1980).*

In 1000 random patients Beck and Hsu in (1965) reported 64.5% to be incontinent during pregnancy.

Most studies on urinary incontinence during pregnancy have been based on the patients subjective report and/or simple cystometry. By these means it is not possible to evaluate accurately continence parameters *(Ulmsten et al., 1977).*

AIM OF THE WORK

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To elucidate the urodynamic changes in the normal pregnancy.

REVIEW OF LITERATURE

THE EMBRYOLOGY OF THE LOWER URINARY TRACT

The bladder and urethra develop within the cloaca, which evolves from the primitive gut.

The cloaca is separated from the amniotic cavity by the cloacal membrane and is composed of two portions, a dorsal hindgut and an anterior sausage-shaped allantois, which extends into the body stalk *(De Lancey, 1989)*.

The wedge of tissue called the urorectal septum grow caudally to divide the two parts of the cloaca until it reaches the cloacal membrane, thereby dividing the cloaca into an anterior urogenital sinus and a posterior anorectum. This also divides the colacal membrane into the urogenital membrane and anal membrane. The urorectal septum will become the perineal body in the adult.

The portion of the urogenital sinus lying above the mesonephric ducts is continuous with the allantois and is called the vesicourethral canal, it will form the urethra and bladder in the adult. The sinus below the mesonephric ducts is destined to become the vaginal vestibule.

The female urethra and bladder develop from four different embryologic primordia within the urogenital sinus. These are the detrusor, trigonal, urethral smooth muscles, and urethral striated muscle primordia *(Droes, 1974)*.

Although the urethra and bladder form a single continuous mass on gross inspection, microscopically and functionally there are important differences in the muscles from one region to another. These differences are explained by their different embryologic derivations *(De Lancey, 1989)*.

ANATOMY OF THE LOWER URINARY TRACT

The bladder and urethra are a continous unit that functions to store and evacuate urine. There is normally reciprocal activity of the urethra and detrusor masculature, with one being relaxed while the other is contracting. Although the muscles of these parts of the lower urinary tract are closely related, they have specialised areas that reflect their different functions *(De Lancey, 1989)*.

Anatomy of the bladder

The bladder is a hollow muscular organ with a capacity of 300-600 ml but with such power that in conditions of prolonged retention, it can accomodate several litres of fluid *(Jeffcoate, 1987)*.