CRANIAL ULTRASOUND FOR NEWBORNS DELIVERED BY VACUUM EXTRACTION FORCEPS

Thesis
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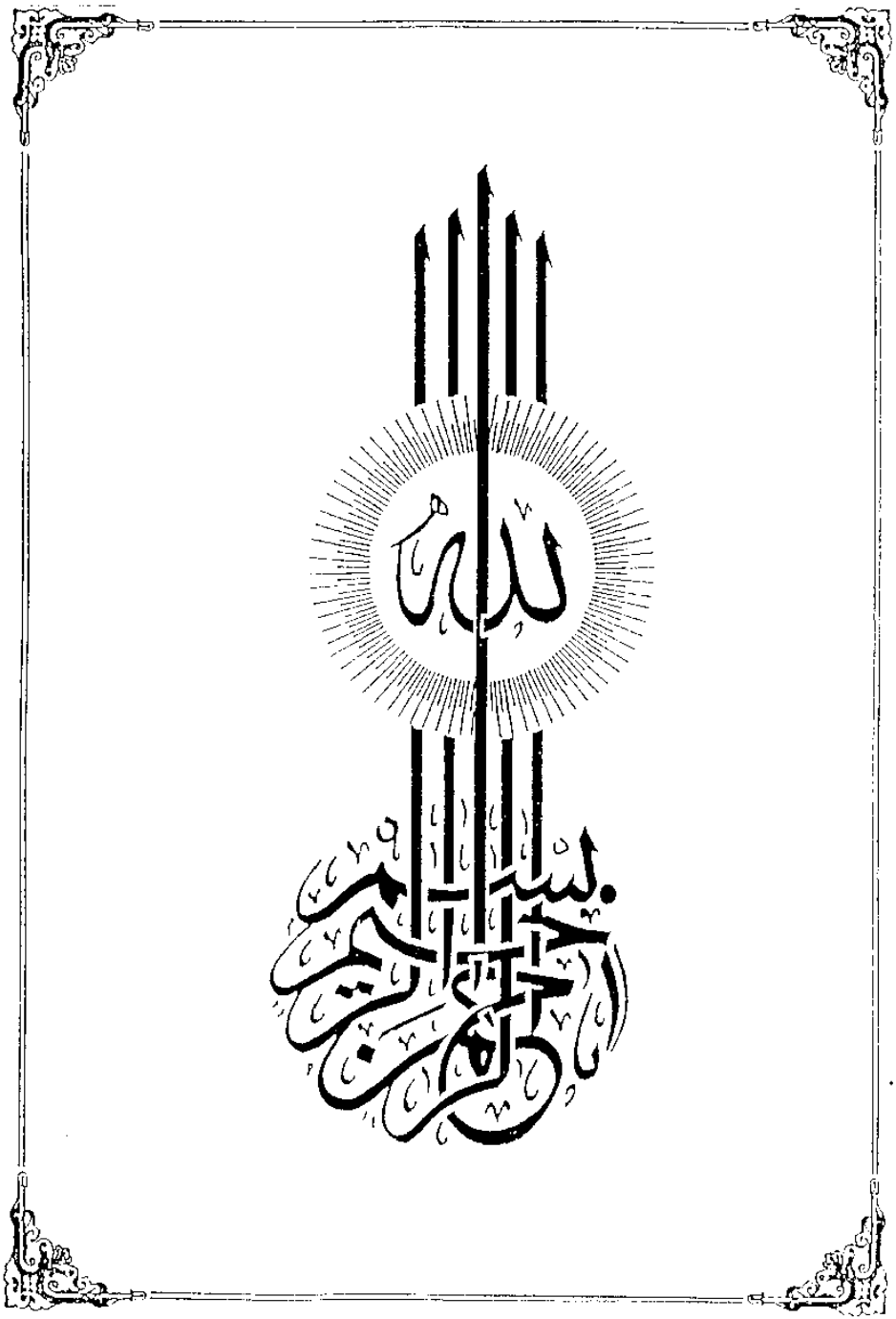
To..

My Mother'S Soul...

Who Sacrified Every Moment of her life to Offer Me Success



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LIST OF ABBREVIATIONS

V.E.F	= Vacuum Extraction Forceps.
U/S	= Ultrasound
Comp	= Complications
CT	= Computed tomography
SEH-I.V.H	= Subependymal Hemorrhage - Intra Ventricular Hemorrhage
I.V.H	= Intra Ventricular Hemorrhage
C.S.F	= Cerebro Spinal Fluid
I.C.P.	= Intra cranial pressure

Introduction And Aim of The Work

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INTRODUCTION

The use of instruments to assist delivery has always been a controversy. Over the last 25 years research and development in obstetrics have been directed in reducing the morbidity and mortality from birth trauma caused by instruments as the vacuum extraction forceps.

The principle of the vacuum extraction forceps is to augment the primary forces generated by the uterus by imposing negative suction forces and positive traction forces on the fetal scalp. Working level of suction force varies from 0.5 to 0.8 Kg/cm^3.

Friedman (1978) had delineated and amplified the risks of instrumental delivery specially to the fetus.

Recently investigators have used two dimentionel B mode grey scale ultrasound for evaluation of neonatal intracranial pathology following vacuum extraction forceps.

The thin skull bones and open anterior fontanelle in infancy made ultrasonographic examination of the brain a practical possibility.

Dewbury and Alwhare (1980) as well as Babcock et al. (1980) started to use the anterior fontanelle which is the largest natural bone free area as an acoustic window to the

brain. High quality images were obtained using the real time sector scanners.

High resolution diagnostic ultrasound equipment is now readily available in most medical centers and detailed visualization of the intracranial injury after the use of vacuum extractors is now possible.

Gaziani et al. (1986) studied the sonographic manifestations of intracranial haemorrhage and its complications following traumatic birth injuries.

The advantages of transcranial ultrasound over other image modalities, such as C/T scan and angiography include probability, low cost, safety, and non ionizing relations and requires no sedation (Rumack and Johnson, 1984).

Aim of The Work

To screen the newborn fetal head delivered by vacuum extraction forceps for normal and abnormal findings.

REVIEW OF LITERATURE

ULTRASOUND

Historical Review

The very first enquiry into the nature of ultrasound dates back to the curies and was followed in 1912 by the unsuccessful attempt to make use of it during the research for the sunken titanic in north atlantic.

Since these days, numerous other attempts to apply ultrasound in the field of medical diagnosis were explored but due to the lack of adequately developed technique, they met the same fate (Hayashi et al., 1981). It was not until the medical revolution occurring with World War II that sonar (Sound Navigation and Ranging) emerged as successful discovery yielding fruitful result when applied in medicine. Shortly after the war (early 50s) its medical application started its rapid ascent reaching its climax in the present day as its range and its scope encompass different branches and subdivision within the very broad field of medicine (Shulman and Loxton, 1981).

Types of Ultrasonics

1. Therapeutic

A continuous wave ultrasonic device had been used successfully in physiotherapy to improve the vascular flow and the permeability of tissues.

2. **Diagnostic**

Two types are commonly used:

a. Continuous Wave Doppler Ultrasound

It is an interrupted ultrasound generated in the form of continuous wave energy. Its principle follows what was first theorized by "Christian Doppler" in 1942 stating that "the frequency of light or sound when transmitted or reflected from a moving object".

Consequently, using this principle in ultrasound the motion of certain tissue interfaces within the body as walls of blood vessels, heart or moving fetal parts can be detected (Felix et al., 1975).

b. **Pulsed Diagnostic Ultrasound**

This is an interrupted generation of ultrasound. the electric energy is intermittently fed into the transducer from which short pulses of sound are emitted followed by period of no sound, during which it acts as a receiver. This is the most one commonly used in medical diagnosis (Sanders, 1975).

1. A-mode (Amplitude Modulation)

The most basic formation of display is the A-mode or amplitude modulation. It displays the echoes as vertical spikes over a base line axis with the height of the spike related to the intensity of the echo reflected (strong