AL-AZHAR University
Faculty of Medicine
Department of pediatrics

Newborn Hearing Screening Program In Alexandria

Thesis

Submitted for the partial fulfillment
of Master degree in pediatrics

By

Rania Abd Al-Hady Ahmad Al-Esawy

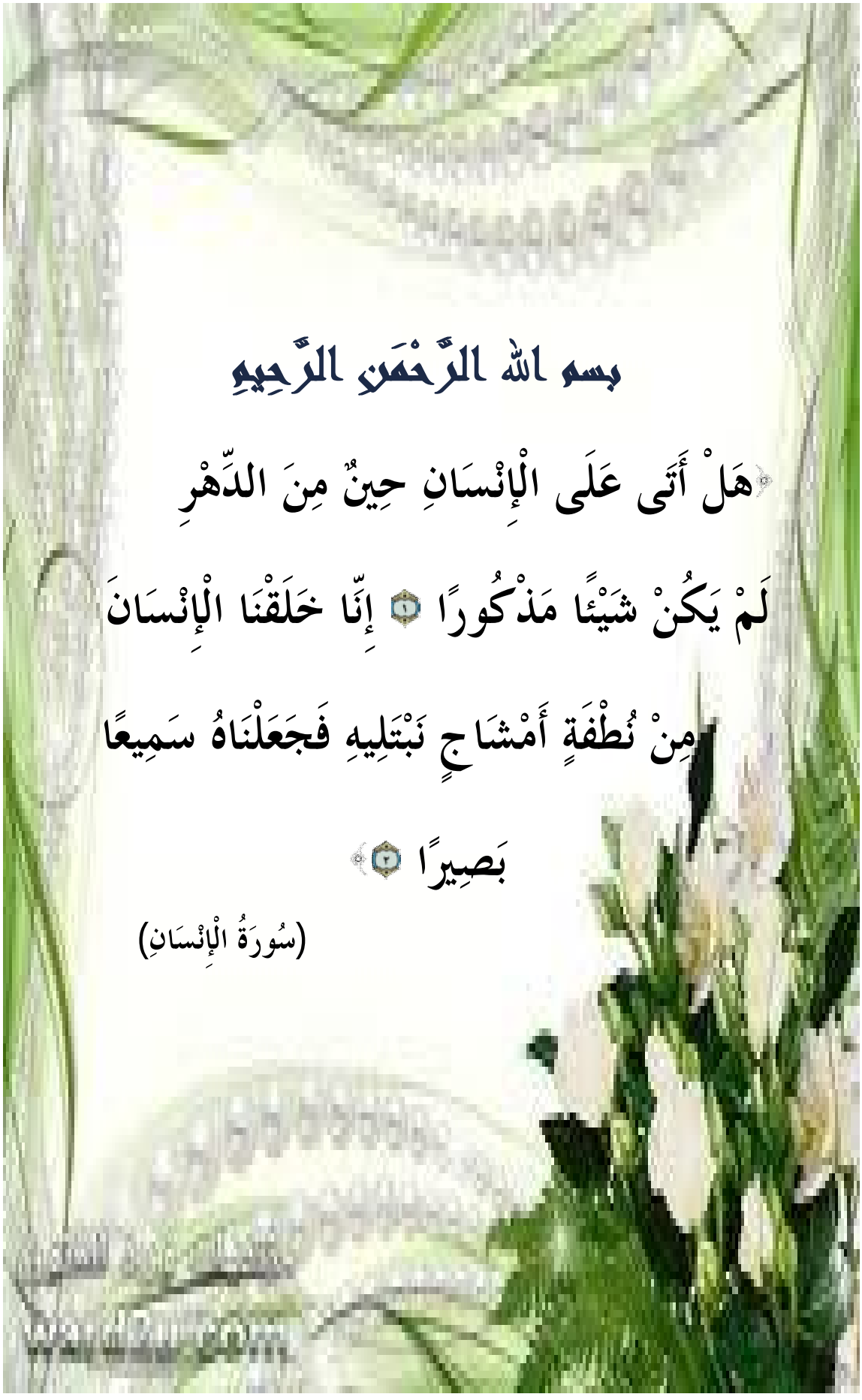
Supervised by

Mohammad Mohammad Almazahy MD
Professor and head of department of pediatrics and neonatology
Faculty of Medicine
Al-AZHAR University-Damietta

Hany Abdalhady AlKhalegy
Lecturer of pediatrics
Faculty of Medicine
Al-AZHAR University-Damietta

Hany Mohammad Hammed Hussein
Consultant of ENT
General Authority for Health Insurance in Alexandria
North West Delta

Faculty of Medicine
AL-AZHAR University
Damietta
2013



بسم الله الرَّحْمَنِ الرَّحِيمِ

﴿هَلْ أَتَى عَلَى الْإِنْسَانِ حِينٌ مِنَ الدَّهْرِ
لَمْ يَكُنْ شَيْئًا مَذْكُورًا ۝١ إِنَّا خَلَقْنَا الْإِنْسَانَ
مِنْ نُطْفَةٍ أَمْشَاجٍ نَبْتَلِيهِ فَجَعَلْنَاهُ سَمِيعًا
بَصِيرًا ۝٢﴾

(سُورَةُ الْإِنْسَانِ)

ACKNOWLEDGMENT

First of all, I wish to express my endless thanks to ALLAH
for giving me the help to perform this work

I would like to express my deepest thanks and highest appreciation to **Prof.Mohamed Mohamed Elmazahy** **professor and head of department of pediatrics, faculty of medicine, Al-Azhar University –Damietta** *,for his valuable help, precious advice, continuous encouragement and constructive guidance that were the most driving forces for the initiation, progress and completion of this work.*

I would like to express my deepest thanks and highest appreciation to **DR.Hany Abdel hady ElKhalegy** **lecture of pediatrics faculty of medicin ,Al-Azhar University –Damietta**, *for his continuous support, enriching observations and sincere advice throughout this work.*

This work wouldn't come to light without the help, patience ,co-operation and precious advice of **DR. Hany Mohammed Hammed Hussein** **consultant of ENT ,Alexandria Health Insurance hospital,** *I would like to express a lot of thanks for him ,for his encouragement .*

Also, I would like to convey my special thanks to my family for their constant support.

Rania Abd Al hady Ahmed El -Esawy

LIST OF CONTENTS

Title Page No.

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

Abbrev.	Meaning
• ABR	Auditory Brain Stem Response
• AAP	American Academy of pediatric
• AAA	American Academy of Audiology
• CHL	Conductive Hearing Loss
• Db	decibel
• DW	Down Syndrome
• EHDI	Early hearing detection and intervention
• HL	Hearing loss
• HIE	Hypoxic ischemic encephalopathy
• MHL	Mixed Hearing loss
• NHL	normal hearing level
• NPV	Negative productive value
• TOAEs	Transient Oto Acostic Emission
• TSB	Total serum billirubin
• PPV	Positive predictive value
• SNHL	Sensory neural hearing loss

Introduction

INTRODUCTION

Although most babies can hear normally, 1 to 3 of every 1,000 babies are born with some degree of hearing loss. Without newborn hearing screening it is difficult to detect hearing loss in the first months and years of baby's life **(American Academy of Pediatrics , 2012).**

It has long been recognized that unidentified hearing loss at birth can adversely affect speech and language development as well as academic achievement and social-emotional development. Historically, moderate-to-severe hearing loss in young children was not detected until well beyond the newborn period, and it was not unusual for diagnosis of milder hearing loss and unilateral hearing loss to be delayed until children reached school age **(JIH, 2007)**.

The age of detection of hearing loss without newborn screening averages between 14 – 30 months. Undetected, hearing loss hampers speech, language, and cognitive development **(Yoshinaga –Itano , 2008)**.

The goal of early hearing detection and intervention (EHDI) is to maximize linguistic competence and literacy development for children who are deaf or hard of hearing. Without appropriate opportunities to learn language, these children will fall behind their hearing peers in communication, cognition, reading, and social-emotional development**(JIH, 2007).**

Such delays may result in lower educational and employment levels in adulthood. To maximize the outcome for infants who are deaf or hard of hearing, the hearing of all infants should be screened at no later than 1 month of age **(JIH, 2007)**.

The frequency of the various causes of hearing loss in children has changed over the past thirty years and will probably continue to change as newborn hearing screening becomes available and as more ways develop to prevent hearing loss. Hereditary causes and neonatal intensive care unit (NICU) graduates are contributing now to a major part of the causes of hearing loss in children. The category of NICU graduates easily identifies a group of children who are at risk for hearing loss since they are exposed to unique health experiences, the medical conditions, the potentially ototoxic interventions and complications **(Roizen, 2009)** .

Newborn hearing screening focuses on identifying hearing loss early. Catching problems sooner rather than later can make a big difference in a child's development **(AAP , 2012)**.

Neonatal hearing screening procedures may be divided into two categories: behavioral techniques which are subjective and electro-physiologic procedures which have greater sensitivity and specificity **(Suzuki, 2004)**.

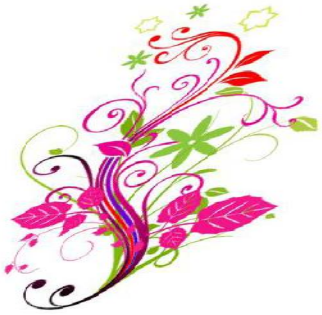
There are 2 screening tests that may be used Otoacoustic Emissions (OAE)—This test measures sound waves produced in the inner ear. A tiny probe is placed just inside the baby's ear canal. It measures the response (echo) when clicks or tones are played into the baby's ears.

Automated Auditory Brainstem Response (AABR)—This test measures how the hearing nerve responds to sound. Clicks or tones are played through soft earphones into the baby's ears. Three electrodes placed on the baby's head measure the hearing nerve's response. Both tests are quick (about 5 to 10 minutes), painless, and may be done while the baby is sleeping or lying still. One or both tests may be used **(AAP, 2012)**.

Regardless of previous hearing-screening outcomes, all infants with or without risk factors should receive ongoing surveillance of communicative development beginning at 2 months of age during well-child visits **(AAP, 2002)**.

In addition, the JCIH (2007) recommended that all infants with risk indicators should be evaluated by an audiologist every 6 months for the first 3 years of life. This helps to quickly identify hearing status changes so that intervention can occur, limiting any impact the hearing loss has on speech and language development **(Nelson, 2008)**.

When identification and intervention occur at no later than 6 months of age for newborn infants who are deaf or hard of hearing, the infants perform as much as 20 to 40 percentile points higher on school-related measures (vocabulary, articulation, intelligibility, social adjustment, and behavior) **(Yoshinaga-Itano , 2004)**.



Aim of the work