



شبكة المعلومات الجامعية

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



شبكة المعلومات الجامعية
@ ASUNET



شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم



شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكرو فيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد أعدت دون أية تغيرات



يجب أن

تحفظ هذه الأفلام بعيدا عن الغبار

في درجة حرارة من ١٥-٢٥ مئوية ورطوبة نسبية من ٢٠-٤٠%

To be Kept away from Dust in Dry Cool place of
15-25- c and relative humidity 20-40%

بعض الوثائق الأصلية تالفة

بالرسالة صفحات لم ترد بالاصل



618,9201

**CLINICAL AND BRAIN IMAGING ASSESSMENT
OF SOME HIGH RISK NEWBORNS**

A THESIS

Submitted for the partial fulfillment of the M.D. Degree in Pediatrics

Presented by

Nafisa Hassan Refat Abd El Aziz

M.B.B.Ch., M.Sc. (*Pediatrics*)

Supervised by

Prof. Dr. Fardous A. Abd El Hafez

Professor of Pediatrics

Faculty of Medicine

Assiut University

Dr. Hanan A. Noaman

Assistant Professor of Pediatrics

Faculty of Medicine

Assiut University

Dr. Ahmed M. Hamed

Assistant Professor of Radiology

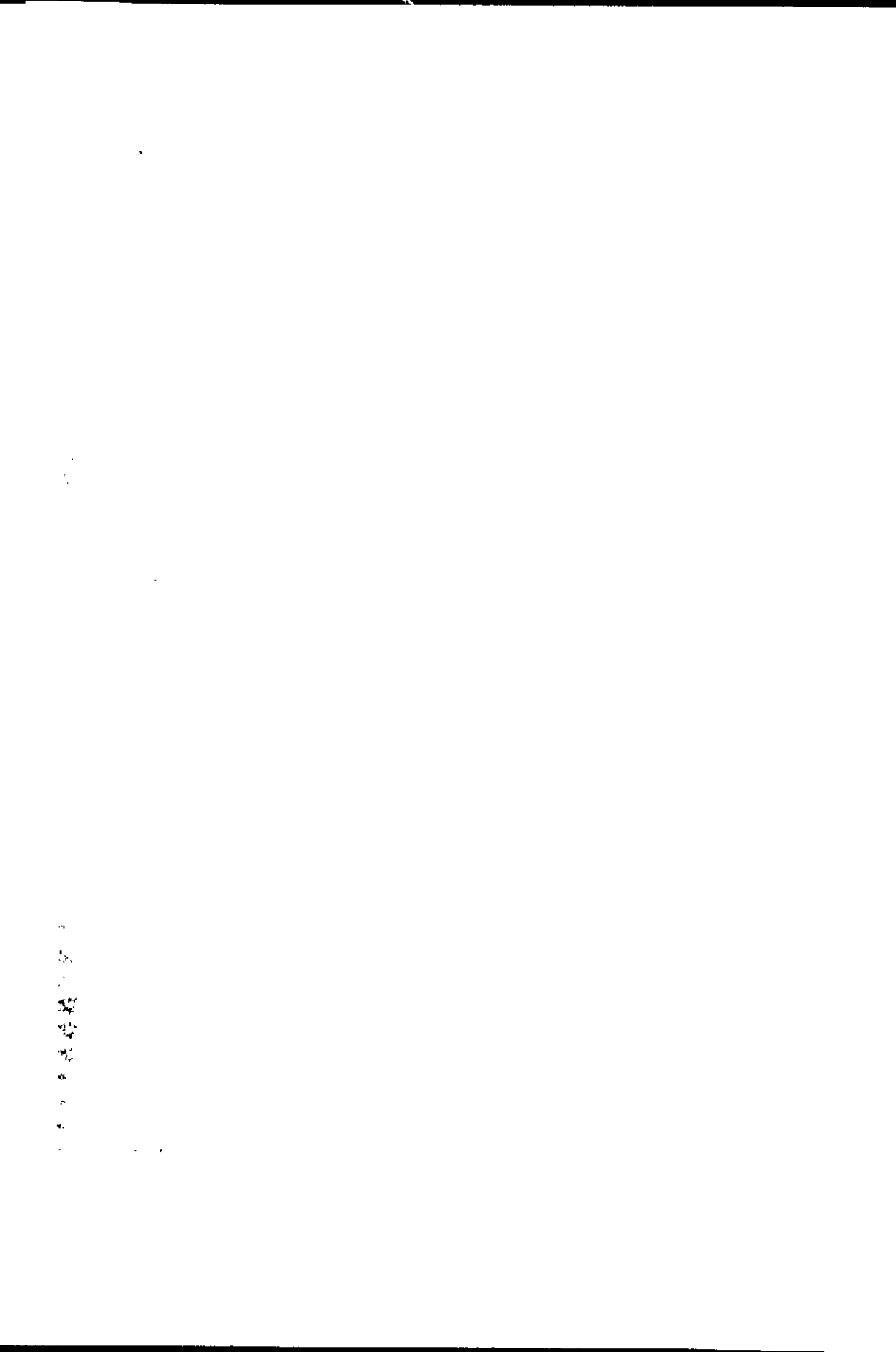
Faculty of Medicine

Assiut University

Faculty of Medicine

Assiut University

2004



CONTENTS

CONTENTS

Introduction and aim of the work	1 ~ 2
Review of literature	
– High risk infants	3 ~ 4
– Maternal risk factors	5 ~ 9
▪ Maternal personal factors	5
▪ Maternal age and parity	5
▪ Maternal medications	6
▪ Maternal diseases	7 ~ 8
▪ Factors related to present pregnancy	8 ~ 9
– Natal risk factors	10 ~ 11
▪ Mode of delivery	10
▪ Anesthesia and analgesia	10
▪ Place of delivery	10
▪ Premature rupture of membranes	11
▪ Other conditions of labor and delivery	11
– Neonatal risk factors	12
– Low birth weight infants	12
▪ Definitions	12
– Intrauterine growth restriction	13 ~ 17
▪ Definition	13
▪ Etiology	13
▪ Types of IUGR	14
▪ Clinical features of SGA babies	14
▪ Problems of IUGR infants	15
▪ Management	16
▪ Outcome	16
– Prematurity	17 ~ 19
▪ Identifiable causes of preterm birth	17

▪ Clinical manifestations	87
▪ Complications of neonatal meningitis	88
▪ Laboratory investigation of neonatal meningitis	88 ~ 90
▪ radiological studies	90 ~ 93
▪ Treatment of neonatal meningitis	93 ~ 95
▪ Prognosis of neonatal meningitis	95
- Congenital anomalies	96
▪ Common life threatening congenital anomalies	96 ~ 97
- Congenital anomalies of the Central nervous system	98 ~ 115
▪ Neural tube defects (dysraphism)	98 ~ 102
• Incidence	98
• Etiology	98
• Types of neural tube defects	98 ~ 101
• Neuroimaging in dysraphism	101
▪ Disorders of neural migration	102 ~ 104
▪ Agenesis of the corpus callosum	104
▪ Microcephaly	105
▪ Hydrocephalus	106 ~ 111
• Definition	106
• Physiology	106
• Aetiological classification of hydrocephalus	108 ~ 109
• Features of progressive infantile hydrocephalus	109
• Imaging	110
• Treatment	111
• Prognosis	111
▪ Disorders of the cerebellum	112
• Dandy - walker syndrome	112
• Cerebellovermain hypoplasia	113
• Chiari malformation	113 ~ 115
▪ Normal variants could be detected by neurosonography	115
- Imaging of the neonatal brain	116 ~ 133
- Neonatal cranial ultrasound	117 ~ 122
▪ Physical equipment	117

▪ Biological side effects of diagnostic ultrasonography	117
▪ Neurosonography	117
▪ Normal appearances	118 ~ 121
- Brain computed tomography	122 ~ 125
▪ Technique	122 ~ 123
▪ Transport	124
▪ Indications of computed tomography	124 ~ 125
- Magnetic resonance imaging	126 ~ 127
▪ Technique	126
▪ Uses of MRI	126
▪ Problems associated with neonatal MRI	126
- Methods for assessing cerebral blood flow	127 ~ 133
- Transcranial Doppler ultrasound	127 ~ 133
▪ Doppler criteria	127 ~ 128
▪ Physiologic influences on Doppler recordings	128 ~ 131
▪ Clinical applications	131 ~ 133
▪ Doppler and prognosis	133
- Other Methods For Assessing Cerebral Blood Flow	133
▪ Near infrared spectroscopy (NIRS)	133
▪ Single photon emission computed tomography (SPECT)	133
▪ Magnetic resonance spectroscopy	133
Subjects and methods	134 ~ 140
Results	141 ~ 199
Discussion	200 ~ 221
Summary	222 ~ 226
Conclusion and recommendations	227 ~ 228
References	229 ~ 263
Arabic summary	

LIST OF TABLES

No	Table	Page
1	Problems of IUGR (SGA) infants	15
2	Possible etiologic factors associated with GMH - IVH in low birth weight infants	23
3	Clinical presentation of SEH - IVH	25
4	Use of parenteral alimentation solutions	39
5	Effects of Asphyxia	54
6	Hypoxic ischemic encephalopathy in term infants	55
7	New classification of HIE	56
8	Bacterial causes of systemic neonatal infection	71
9	Non bacterial cause of systemic neonatal infection	71
10	Types of neonatal infection by age of onset	74
11	Common organisms causing neonatal infection according to the onset	74
12	Normal ranges for flow velocities in based cerebral arteries in cm / sec	130
13	The frequency of some maternal factors in high risk newborns & controls	153
14	Mean $\pm$ SD of anthropometric measurements and vital signs in high risk newborns & controls	154
15	The frequency of clinical data in high risk newborns	155
16	Mean $\pm$ SD of biochemical data in high risk newborns & controls	156
17	Mean $\pm$ SD of values of blood picture & blood gases in high risk newborns & controls	157
18	Frequency of transcranial sonographic & CT findings in high risk newborns	158
19	Frequency of transcranial sonographic & CT findings in high risk newborns in relation to maternal preeclampsia	159
20	Frequency of transcranial sonographic & CT findings of high risk newborns in relation to birth weight	160

No	Table	Page
21	Frequency of transcranial sonographic & CT findings of high risk newborns in relation to heart rate	161
22	Frequency of transcranial sonographic & CT findings of high risk newborns in relation to systolic blood pressure	162
23	Frequency of transcranial sonographic & CT findings of high risk newborns in relation to +ve neurological signs	163
24	Frequency of transcranial sonographic & CT findings of high risk newborns in relation to P _{CO} 2	164
25	Frequency of transcranial sonographic & CT findings of high risk newborns in relation to O ₂ saturation	165
26	Frequency of transcranial sonographic & CT findings of high risk newborns in relation to hemoglobin level	166
27	Mean $\pm$ SD of transcranial Doppler values in high risk newborns & controls	183
28	Mean $\pm$ SD of transcranial Doppler values of high risk newborns in relation to heart rate	184
29	Mean $\pm$ SD of transcranial Doppler values of high risk newborns in relation to systolic blood pressure	185
30	Mean $\pm$ SD of transcranial Doppler values of high risk newborns in relation to P _{CO} 2	186
31	Mean $\pm$ SD of transcranial Doppler values of high risk newborns in relation to O ₂ saturation	187
32	Mean $\pm$ SD of transcranial Doppler values of high risk newborns in relation to hemoglobin level	188

LIST OF FIGURES

No	Figure	Page
1	Holoprosencephaly features	103
2	Sagittal view of ventricular system	107
3	Anterior view of ventricles	107
4	Dandy Walker malformation	112
5	Arnold - Chiari malformation	114
6	Diagram showing three standard sagittal sections (A) and six coronal sections (B) in Transcranial sonar	118
7	Definition of indices used in Doppler ultrasound	128
8	Transcranial sonar showing left grade I IVH	167
9	Transcranial sonar showing bilateral grade III IVH	168
10	Brain CT scan showing bilateral intraventricular hemorrhage	169
11	Transcranial sonar showing IVH complicated by ventricular dilatation	170
12	Transcranial sonar showing periventricular echodensitis	171
13	Transcranial sonar showing post meningitic hydrocephalus	172
14	Transcranial sonar showing congenital aqueductal stenosis	173
15	Transcranial sonar showing occipital encephalocele	174
16	Transcranial sonar showing Dandy Walker malformation.	175
17	Brain CT showing Dandy Walker malformation	176
18	Transcranial sonar showing brain edema	177
19	Brain CT scan showing brain edema	178
20	Brain CT showing diffuse bilateral white matter hypodensity	179
21	Brain CT showing meningeal enhancement and ventriculitis shown after TV contrast injection	180
22	Brain CT showing bilateral frontal encephelomalacia	181
23	Brain CT showing subarachnoid hemorrhage	181
24	Transcranial Doppler sonography of internal carotid artery (ICA) & middle cerebral artery (MCA) & anterior cerebral artery (ACA)	182
25	Correlation between MV (MCA) and heart rate in preterms with meningitis	189