AIN SHAMS UNIVERSITY
INSTITUTE OF POSTGRADUTE
CHILDHOOD STUDIES
MEDICAL DEPARTMENT

COGNITIVE AND BEHAVIOURAL SEQUELAE OF CLOSED HEAD INJURY IN A SAMPLE OF EGYPTIAN CHILDREN

THESIS

Submitted in Partial Fulfilment of the Master Degree in Childhood Medical Studies (Pediatric)

By

ALAA HAMED ABOU EL-SOUD

M.B., B. CH.

Under Supervision of

Dr.
AFAF HAMED KHALIL

Prof. Of Psychiatry
Ain Shams University

Dr.
OLWEYA. M. ABDUL. BAKY

Ass. Prof. Medical Childhood Studies
Institute of Postgraduate Childhood Studies, Medical Dep

Dr.
FOADA M. ALI HADIA

Lecturer of Psychology
Institute of Postgradute Chilhood Studies Psychological Dep.

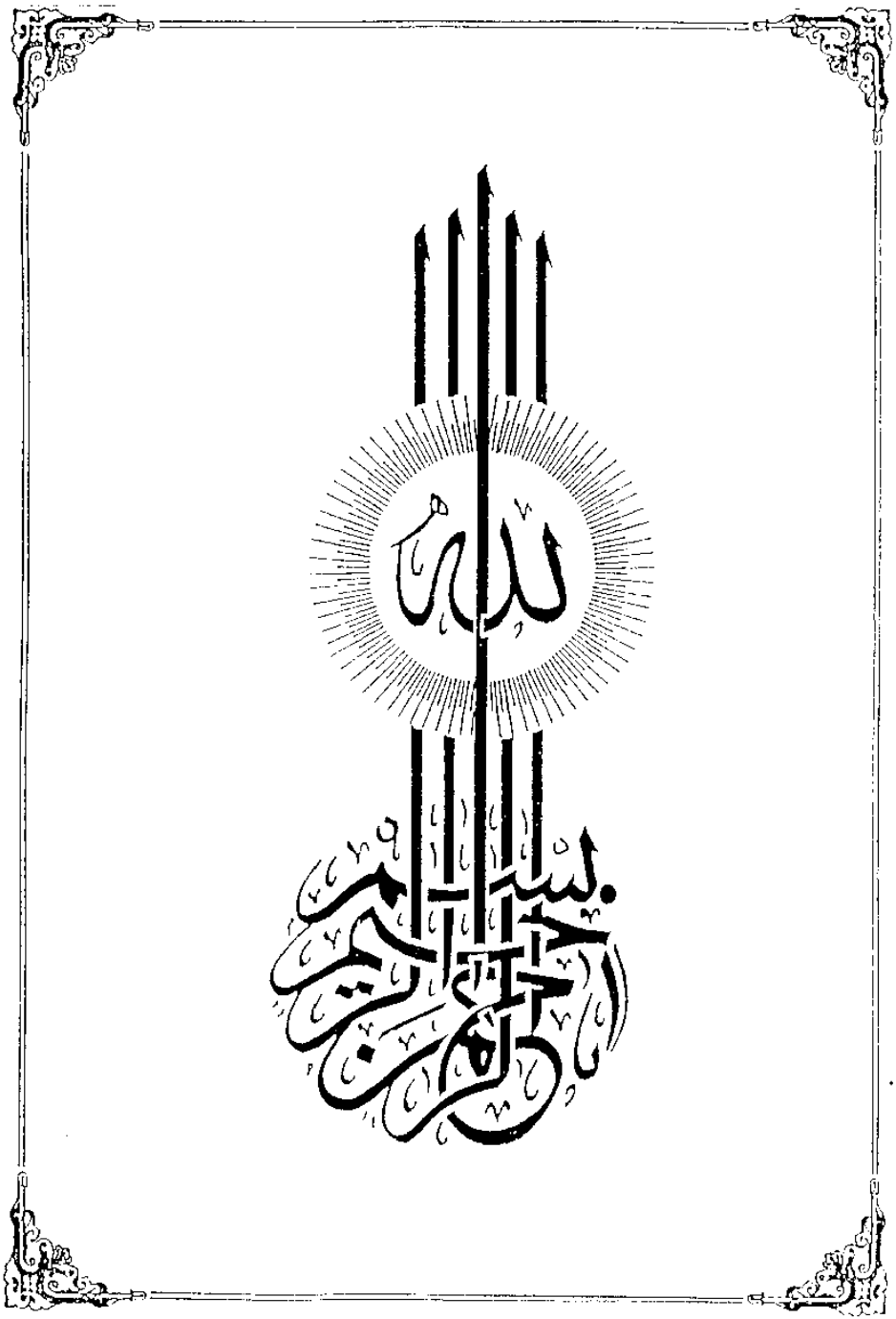
1994

قالوا سبحانك

لا علم لنا إلا ما علمتنا إنك أنت العليم الحكيم

سورة البقرة آية ٣٢

صدق الله العظيم



DISCUSSION AND JUDJMENT COMMITTEE

The vice-president for higher studies and research of Ain-Shams University has approved to form the following committee for the discussion of Mr.....

1)- Prof. Hassan Fawzy ..... chairman of Neurology and Psychiatry dept. Zagazig university Chairman.....

2. Prof. Dr. Bishay ..... Prof. of Neurology and Psychiatry Ain Shams University Member.....

3. Prof. Hamed Kadik ..... Prof. of Neurology and Psychiatry Ain Shams university Member.....

4 .....

..... Member.....

ACKNOWLEDGMENT

*First of all, Thanks to **"ALLAH"** my deepest greatfulness and indebtedness to **"ALLAH"**. I always asking **ALLAH** to give me the ability to do my work kindly and faithfully.*

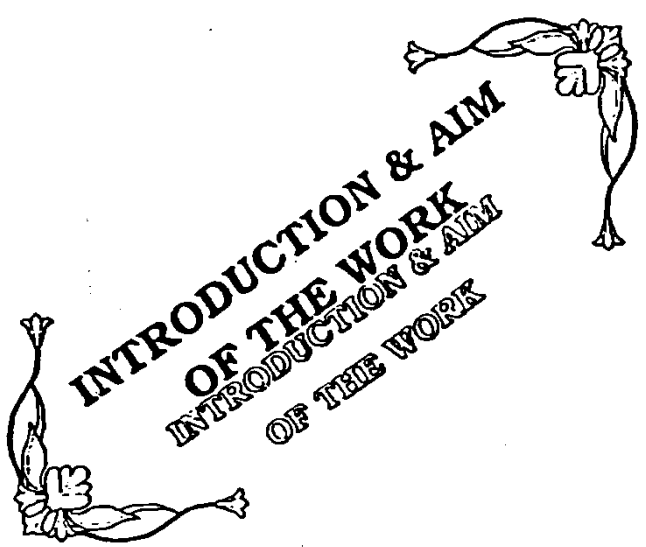
*It is a pleasure to express my deepest thanks and gratitude to Professor Dr. **AFAF HAMED KHALIL** Professor of psychiatry, Ain Shams University. This study has been done under here supervision.*

*My deeply thanks and gratitude to Dr. **OLWEYA M. ABDEL-BAKY**, Ass. Prof. of Medical childhood studies, institute of postgraduate childhood studies, Ain Shams University, who was so kind and give me continuous help, I shall never forget her kind encouragement.*

*I also express my thanks to Dr. **FOADA M. ALI HADIA**, Lecturer of Psychology, institute of childhood studies, ain Shams University, for here guidance through the course of this work.*

Lastly, I fell deeply thankfull to all those whom and for whom this study has been done.

CONTENTS



INTRODUCTION & AIM OF THE WORK

INTRODUCTION

In recent years head injuries have occured with increasing frequency owing to the high speed of modern life **(John, 1985)**.

Each year in US approximately 5 million children present to medical attention for evaluation of head trauma, since the majority of these injuries may be managed on outpatient basis, the physician's office will frequently be the site of assessment and disposition. Alternatively, roughly 200.000 children will be hospitalized, primarly for careful and serial neurologic observation. 50.000 patient suffer more severe craniocerebral trauma requiring prolonged hospitalization and an additional 3.000 to 4.000 pediatric patient die **(Schwartz et al., 1986)**.

Among the vast array of neurologic diseases, cerebral trauma ranks high in order of frequency and gravity. The basic process is at once both simple and complex. Simple because there is no problem about etiologic diagnosis, complex because of uncertainty about the pathogenesis of the immediate cerebral disorder and a number of delayed effects that may complicate the injury **(Raymond and Maurice, 1986)**.

Head injury includes the results of any mechanical force applied to the brain or its coverings, the most frequent causes of injury include falls of various types, vehicular accidents and blows received during sports activities. Boys are affected much more frequently than girls. Less commonly head injury may result from the process of birth or from penetrating foreign bodies. Finally head trauma may result from intentional injury as one aspect of the "battered child syndrome" **(Robert et al., 1989)**.

It is common misconception that craniocerebral injuries are matters that concern only the neurosurgeon and not the general physician. Actually some 80% of head injuries are first seen by general physician and probably fewer than 20% ever require neurosurgical intervention of any kined and even this number is decreasing **(Williams, 1988)**.

Craniocerebral trauma may be divided according to the nature of injury to the skull into three groups:-

1- Closed head injury:- There is either no injury to the skull or only a linear fracture. These cases can be subdivided according to the severity of brain damage into two main groups. Those with no significant degree of structural damage to the brain, (concussion) and those with destruction of brain tissue by edema, contusion, laceration or hemorrhage.

2- Simple depressed fractures of the skull:- The pericranium is intact, but fractured bone is depressed inward to compress or injury the underlying brain.

3- Compound fracture of the skull:- Indicate that the pericranial tissues have to be, and the patient is more likely to have severe brain damage **(Roger, 1985)**.

The complications of head injury include vascular lesions (e.g. hemorrhage, thrombosis, aneurysms), infections, pneumocele, injury to cranial nerves and focal cerebral lesions. The sequelae of head injury are convulsive seizures and psychiatric disorders **(Lewis, 1984)**.

The acute neurological, cognitive, emotional and physical sequelae of closed head injury, including mild head injuries are well documented for children sample. Recent interest has focused on the short and long outcome following traumatic brain injury. Commonly identified problems are in the areas of behavioural dysfunction including anxiety, depression and social withdrawal. Families identify the behavioural changes as the most enduring and troublesome compared with the physical and cognitive sequelae **(Harry, 1993)**.

Certain late effects of head injury may be come apparent within a few weeks following trauma or may not be recognized for several years. aLthough head injury is generally thought of as an acute disease, there are certain late residual effects and complications that may make it a chronic illness **(Rrobert et al., 1989)**.

Cognitive and behaviour disturbances are repeatedly stressed as the commonest and most disruptive of the sequelae of head injury in children. Recently aquried abilities to walk or talk may be lost, or school work is found to be impaired for a time, restless, overactivity, impulsive at home and at school and explosive outbursts of anger and irritability. Marked delinquency may appear by way of stealing, and destructiveness. Post-traumatic behaviour disturbance can have serious consequences in terms of school achievement, which may be markedly impaired. In the most severe examples schooling is completely disrupted **(William, 1988)**.

THE AIM OF THE WORK

Head trauma is a common occurrence in childhood and the spectrum of its consequences is broad. Depending on the severity, type, and location of the injury, outcome may range from compleat recovary in children with mild injuries to sever disability in children with more serious injuries potential deficits are multiple and include motor, communicative congitive, sensory, behavioral and emotional problems.

This study focuses on long-term outcome in children with closed head injury which constitute more than 80% of traumatic brain injuries. Children 6-12 years which are involved in this study constitute about 7.2 millions (15%) 3.7 millions males and 3.5 millions females according to the results of 1986 population and housing census Fig. (1).

Previous studies focuses on sever head injuries and its sequelae it was the first time in Egypt to study the outcome of mild closed head injuries in children we must pay more attention to our children and their health as they constitute the fuature of Egypt.

The aim of this study is to assess any adverse behavioral or congitive sequelae of mild closed head injury in a sample of Egyptian children.

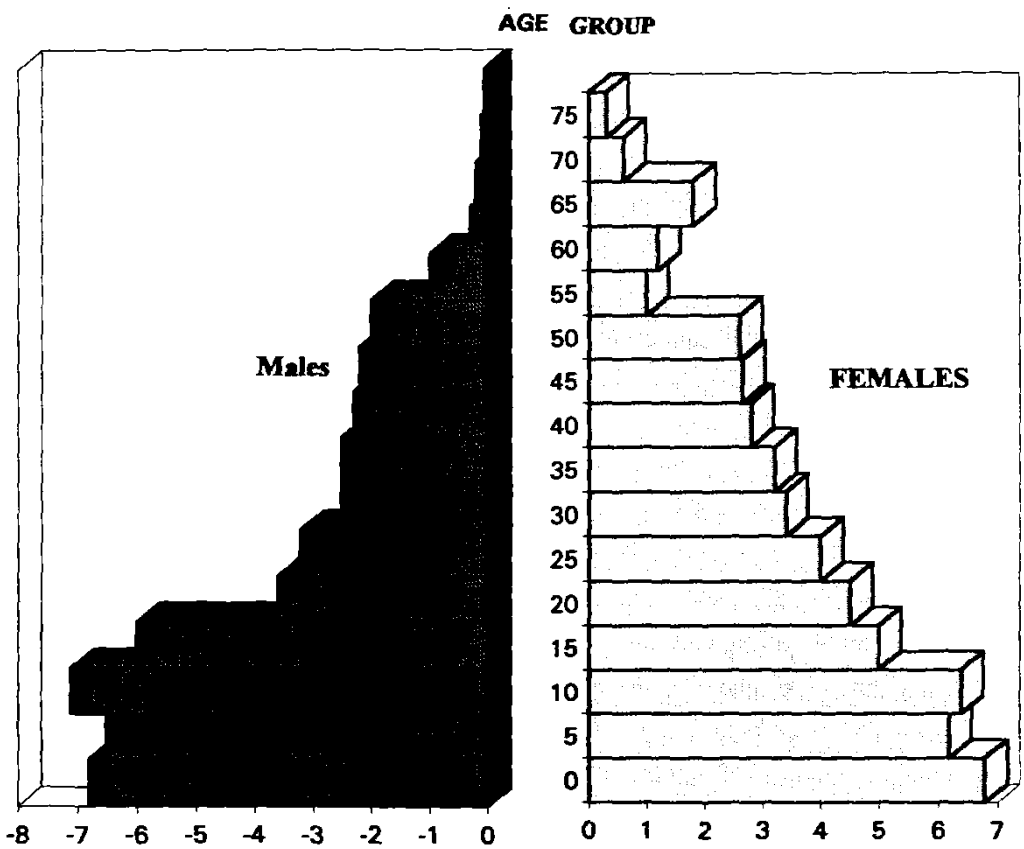
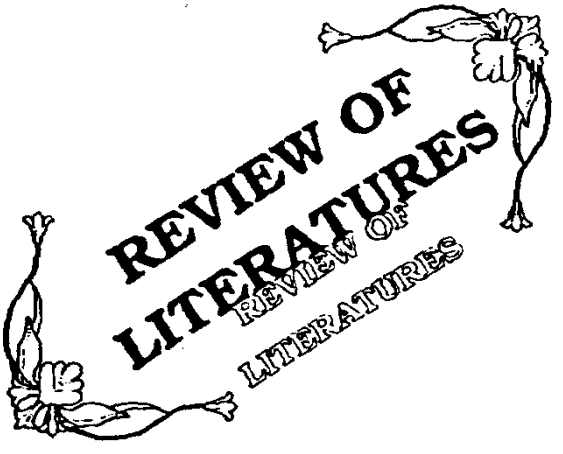


Fig. (1): Egypt's population pyramid.

Population by age and sex in 1986.

Age group	Males		Female		Total	
	No.	%	No.	%	No.	%
All ages	2463526	100.0	23549752	100.0	47205049	100.0
Less than 6.	4723526	19.0	4533002	19.0	9256528	19.0
6-	3739263	15.0	364968	15.0	7208731	15.0
12-	15503127	63.0	14856498	63.0	30359625	63.0
65 & over	689381	3.0	690781	3.0	1380165	3.0



REVIEW OF LITERATURES

EPIDEMIOLOGY

The incidence of traumatic brain injury defined as physical damage to or functional impairment of the cranial contents from acute mechanical energy exchange is approximately 200 per 100.000 children per year in the United States **(Michaud et al., 1993)**.

Head injuries in childhood are relatively frequent occurrence **(Field, 1976)**.

In the united kingdom, the number of children treated in hospitals for injury has risen steadily since 1950s **(Craft, Show, and Cartlidge, 1972)**.

In Newcastle - Upon - Tyne, England, the number of children admitted to hospital with head injuries has increased six fold over the past 20 years, and in 1971 they constituted 13.9% of all admissions to pediatric wards. In the united states the picture is not difference. Intracranial injury and fractures of the skull and facial bones constitute 3.6% of hospital admissions and 3.3% of hospital days. They are the most common neurologic conditions resulting in the hospitalization of children under the age of 19 **(North, 1976)**.

Craniocerebral trauma is a major cause of serious disability and death in childhood about 200.000 children each year are admitted to united states hospitals for observation and treatment following head injury. A much larger number are managed at home **(Behrman and Vaugan, 1987)**.

Between 2000-3000 per million population are admitted to hospital each year because of head injury for each patient admitted 3-4 others have been in the accident and emergency department of the hospital or in the general practitioner's surgery and allowed home. Of those admitted to the hospital, approximately 5%

or 100 per million per year are suffering from severe head injury. A further 5-10% are suffering from moderate traumatic brain injury. While the majority 85-90% are regarded as having suffered minor traumatic brain injury **(Douglas, 1993)**.

Age:

Head injuries constitute one of the most common causes of brain damage among school age children **(Swinyard,Swansen,and Greenspan, 1963)**.

The circumstances in which children sustain head injuries have been noted. Among preschool children accidents in the home account for a significant proportion of cases, but in school age children falls constitute the commonest cause of milder head injuries treated in hospitals. Boys outnumber girls in rate of head injuries, sustained particularly during the primary school years which constitute, the peak age period for head injuries in childhood **(Rutter et al., 1980)**.

The peack incidence of childhood head injury occurs under one year of age over 50% of these cases are due to birth trauma. A smaller second peak incidence is found between three and four years. Most children under the age of three are injured in the home environment. Injury due to automobile or other moving vehicles increases markedly between age four and eight years and then fall of presumably as the child learns of these dangers, in one series 12% of injuries occured in school ages five and thirteen years **(Julian, 1989)**.

It can be estimated that each year 375.000 US children and adolescents younger than the age of 17 years sustain head injuries that require medical care