

17/1/2007 2000

# STATISTICAL STUDY OF ACUTE HEAD-INJURED PATIENTS ADMITTED TO DEMERDASH HOSPITAL DURING ONE YEAR

## THESIS

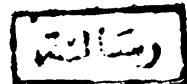
Submitted for Partial Fulfilment of  
Master Degree  
In  
(GENERAL SURGERY)

By  
DAOUD MOHAMED MAHMOUD TAHER EL-MOHTASEB  
M. B., B. Ch.

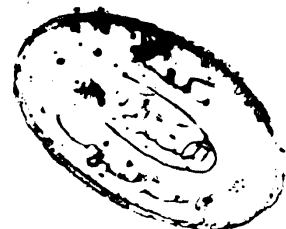
Supervised By  
**Prof. Dr. HASSANEIN ALSHARIF**  
Chief of Neurosurgical Department

Faculty of Medicine  
Ain Shams University

1981



4.5  
12/1/81



## ACKNOWLEDGEMENT

I would like to express my deep thanks and gratitude to my Professor Dr. Hassanein Algharif, Professor of Neurosurgery, Faculty of Medicine, Ain Shams University for giving me the privilege of working under his supervision, for his encouragement, his patience and fruitful guidance throughout the whole work.

I am sincerely indebted to Dr. Alaa Abdel Hai, Lecturer of Neurosurgery, Faculty of Medicine, Ain Shams University. And to Dr. Adel Hussin, Lecturer of Neurosurgery. And to Dr. Saied Abdel Azeim, Assistant Lecturer of Neurosurgery, for giving me their great support and help.

I also would like to express my thanks and gratitude to all my colleagues, the residents of Neurosurgical Department, who participated in some way or the other to let this work come to such a final picture.



## AIM OF THE WORK

Craniocerebral injury is a common condition and is gaining an ever increasing interest not only by neurosurgeons and surgeons, but also by many of the authorities in any country.

The aim of this work is to determine, in a statistical way the various aspects of this problem in one of the main hospitals in Cairo, Demerdash Hospital.

These aspects include:

- The incidence of craniocerebral injury in each age group and in each sex.
- The most common causes of this type of injury.
- The various types of craniocerebral injury encountered.
- The methods adopted in the treatment of each type.
- The outcome of this injury in relation to the type of injury, age, and type of treatment adopted.

## C O N T E N T S

	Page
INTRODUCTION .....	1
SURGICAL ANATOMY OF THE SCALP, SKULL AND BRAIN...	4
MECHANISM OF ACUTE HEAD INJURY.....	38
PATHOLOGY OF ACUTE HEAD INJURY.....	55
MANIFESTATIONS OF ACUTE HEAD INJURY.....	80
DIAGNOSIS AND TREATMENT OF ACUTE HEAD INJURY.....	
MATERIAL AND METHODS.....	171
RESULTS.....	173
DISCUSSION.....	200
SUMMARY.....	219
REFERENCES.....	223
ARABIC SUMMARY.....	

- - -

# **INTRODUCTION**

## ACUTE HEAD INJURY

### Introduction:

This subject is gaining a continuous interest of many authorities in any country all over the world. It owes its importance not only to the increasing number of fatalities that result from it, but to the social and economic sequences that result from cerebral damage.

In developed countries, head injuries are caused by motor car, industrial, sporting and home accidents in decreasing order of frequency. In the developing countries, however, home accidents come next to motor car accidents as a causative factor. Therefore, motor car accident is the most common cause of head injury.

It has been pointed out that whereas forty years ago deaths from infectious diseases were twice those due to accidents, the roles are now reversed, deaths from infectious diseases being less than half those due to accidents. (Rowbotham, 1964).

In another sense advance in therapy has also had its effect on accident figure. Thus better arrangement for treatment by the use of highly refined methods of

investigations and treatment, antibiotics, safe anaesthesia and blood transfusion have so lowered the mortality rate of head injuries. However, the alarming increase in the number of motor vehicles and in turn the increase in the number of road traffic accidents has led to continuous increasing number of fatalities. Also, in spite of the reduced fatality rate after head injuries, yet, this is outweighed by the substantial increase in the number of permanently disabled.

In United States, accidental injury has become the fourth leading cause of death and the leading cause in the age group of 1 to 44 years. Approximately 50,000 deaths a year result from automobile accidents. It is estimated that injuries to the head occur in 72 per cent of persons involved in automobile accidents and one of every ten such injuries is dangerous or fatal. Also, from 60 to 70 per cent of such fatalities result from injury to the head. (Christopher - Davis, 1978).

Most of the cases of acute head injury are associated with other injuries in the body such as chest, abdominal and skeletal injuries. Therefore treatment of such patients with multiple major injuries usually falls to the lot of the younger surgeon and provides at once a challenge to his skill. However expert he may



have become at the technicalities of resuscitation, the correction of respiratory disturbances and the performance of urgent surgery, it is the decisions he makes about the pattern and priorities of management which in the severely injured will determine the outcome. (Hamilton - Bailey, 1972).

Also, most cases of acute head injury occur in roads and sometimes in areas of some distance from hospital. Therefore, rapid evacuation of casualties to a treatment centre competent to deal with all their problems is of paramount importance. In most countries across the world this is often possible whether by motor vehicles, helicopter, aircraft or a combination of these. Much to be gained from personnels employed in transport vehicles as ambulance officer, policeman and helicopter pilot in the initial evaluation of the condition and in doing the first-aid treatment.

On-spot evaluation and first-aid treatment have important effects on the subsequent evaluation and management undertaken by the surgeon receiving the casualty in the treating hospital.

**SURGICAL ANATOMY OF THE SCALP,  
SKULL AND BRAIN**

## SURGICAL ANATOMY

The head consists of two parts, cranium and face. The face projects and hangs from the antero-inferior wall of the cranium.

The skull is the skeleton of the head. It is made of a large number of bones which, with the exception of the mandible, are so intimately connected to one another that no movement is possible between them.

When the mandible is left out of account the remainder of the skull constitutes the cranium, but, many authors use the term skull as synonymous to the cranium. The upper part of the cranium forms a box to enclose and protect the brain, and it is often termed the calvaria. The remainder of the skull forms the facial skeleton, of which the upper part is immovably fixed to the antero-inferior wall of the calvaria and the lower part is the freely movable mandible. (Grays Anatomy, 1969).

The facial bones are constructed to enclose between them cavities that either lodge important structures, as the orbital cavity, or form part of important passages, as the nasal, nasopharyngeal and oral cavities. Therefore, fracture of one or more of the facial bones may

involve one of the bones of the antero-inferior wall of the calvaria and which manifests itself clinically by the escape of blood, with or without C.S.F., through one or more of these cavities.

The cranium encloses the very important structure, the brain, and is covered by a special covering, the scalp.

#### The scalp

The scalp extends from the top of the nape posteriorly, to the eyebrows anteriorly and to the ears and zygomatic arches at the sides.

The scalp is formed of the following five layers:

- Skin: thick and many of the occipito-frontalis fibres are inserted into it; elsewhere it is tethered by fibrous bands in the subcutaneous tissue to these muscles and the intervening aponeurosis. It is relatively inelastic.

- Subcutaneous fat: very rich in blood vessels and nerves. It is divided into small loculi by fibrous bands that connect the dermis to the underlying occipito-frontalis and the intervening galea. Haematoma in this layer will be small, very painful, tender and slightly mobile. Wounds involving this layer will bleed profusely

and heal rapidly. Haemostasis cannot be secured by applying artery forceps directly to the severed vessel, but, by everting the edges of the divided galea around the edges of the wound by artery forceps.

- Occipito-frontalis muscle: which consists of two bellies, occipitalis and frontalis connected by the intervening aponeurosis, galea. The occipitalis arises from the highest nuchal line and passes into the galea. The frontalis arises from the front of the galea and is inserted into the upper part of the orbicularis oculi and the overlying skin. The galea lies over the vertex attached to both bellies and fades out laterally by blending with the temporal fascia just above the zygomatic arches.

- Loose areolar tissue: filling the subaponeurotic space and limited posteriorly by the attachment of the occipitalis to the highest nuchal line and at the sides by blending of the galea to the temporal fascia. Anteriorly it extends downwards beneath the orbicularis oculi into the eyelids. Bleeding or oedematous fluid in this layer will track down to the eyelids, and it will be diffused painless and involve the whole of the subaponeurotic space.

- Pericranium: is merely the periosteum of the bones of the vault. It is rather loosely attached to bone except at the suture lines where it is firmly attached to sutural ligament. Haematoma beneath this layer will take the shape of the underlying bone.

The blood supply of the scalp is derived from the external and internal carotid arteries. These arteries of the scalp ascend towards the vertex from the peripheral boundaries of the head, therefore, bleeding wounds of the scalp can be controlled, outside hospital, by wounding a bandage around the head below the level of the wound. Also, operative incisions of the scalp must be disposed vertically parallel to these arteries and in the case of performing aU-shaped scalp flap incisions, the base of this flap must be peripherally directed.

Also, as very few branches of these arteries cross the subaponeurotic space to the underlying bone, scalping does not lead to necrosis of the bones of the vault.

The veins of the scalp run back with the arteries. Beside draining the scalp they receive diploic veins from the frontal, parietal, and occipital bones and are connected with the dural venous sinuses by emissary veins. Infection of the scalp may lead to

osteomyelitis of the bones of the vault or to septic thrombophlebitis of one of the venous sinuses.

At this stage it is fruitful to describe the surgical anatomy of the temporal fossa and the zygomatic arch.

The superior and inferior temporal lines diverge from a common origin at the border of the zygomatic process of the frontal bone and sweep boldly up in a convexity that takes them back behind the ear. The temporal fascia is attached to the superior line and passes down to the upper border of the zygomatic arch. The temporalis muscle arises from the area between the inferior temporal line and the infratemporal crest, but, it arises up the side of the skull as the individual grows up.

The middle temporal artery and its accompanying vein pierce the temporal fascia and muscle and ascend vertically upwards deep to the muscle grooving the squamous temporal bone, which is seen in almost every skull examined.