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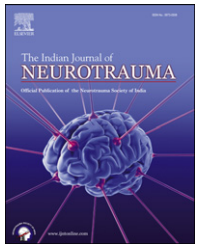

Review Article

Medico-legal issues in patients of traumatic brain: Indian perspective

B.V. Subrahmanyam [a,*], Amit Agrawal [b]

[a] Professor and HOD, Department of Forensic Medicine and Toxicology, Narayana Medical College Hospital, Chintharedypalem, Nellore 524002, Andhra Pradesh, India

[b] Professor, Department of Neurosurgery, Narayana Medical College Hospital, Chintharedypalem, Nellore, Andhra Pradesh, India

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ABSTRACT

TBI is a series of pathological changes that happen due to external mechanical force (s) causing temporary or permanent impairment of neurological function. From a medico-legal perspective, traumatic brain injuries present a complex questions and issues where not only simply determining who is responsible for the accident is important but also it is important to determine how a TBI affects a victim, physically, mentally, and economically. Expert medical advice is increasingly being sought in relation to criminal, insurance, personal injury and negligence issues. The relationship between evidence-based guidance and the determination of medical negligence is complex, a doctor is not guilty of negligence if he has acted in accordance with a practice accepted as proper by a responsible body skilled in that particular art in essence and it is of utmost importance whether standard practice was followed or not. The present paper focuses on the issues and difficulties faced by medical personals while imparting the care to the patients with TBI in an emergency as well as in hospital.

1. Introduction

Traumatic brain injury (TBI) is caused by a blow or jolt to the head or a penetrating head injury that disrupts the normal function of the brain. Common causes of TBI include motor vehicle and bicycle accidents, falls, sport injuries, and assault. The severity of TBI vary from the relatively minor incidents with symptoms lasting only a few hours or days to the most serious which could damage to the brain and having life changing consequences a significant disability. The present paper focuses on the issues and difficulties faced by medical personals while imparting the care to the patients with TBI in an emergency as well as in hospital.

2. Pathophysiology

TBI is a series of pathological changes that happen due to external mechanical force (s) causing temporary or permanent impairment of neurological function. When cranium and its contents suffer an insult from external force depending on the intensity and the involvement resultant damage can cause transient to temporary to permanent neurological effects, deficiencies, debility or even death. Dynamic loading results from direct blow to the cranium (i.e.) contact loading, or rapid acceleration or deceleration of the cranium (i.e.) inertial loading. These lead to differential motion of the brain in relation to skull. Inertial loading causes linear motion

* *Corresponding author*. Tel.: +91 9440735001 (mobile).
E-mail address: docsubrahmanyam@yahoo.co.in (B.V. Subrahmanyam).

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(translational movement), shearing motion (rotational movement) and angular movement – (a combination of translational and rotational movements). TBI is a brain insult due to external physical forces, resulting in functional disability. Primary causes are falls and M.V. accidents, sports, assaults and gunshot injuries can also cause TBI. This is one of leading causes of global disability and death. TBI is mild, moderate or severe. Mild TBI (i.e.) concussion shows 70–90% incidence of all TBI. 15–20% of mild TBI patients suffer long-term dysfunction. Many mild TBI cases as in child abuse, spouse abuse may go with reporting. Boxers suffer from so called punch-drunk syndrome due to repeated mild TBI. In professional football players repetitive concussions leading to cognitive impairment and clinical depression are recorded. Many ice hockey players suffer from impaired memory depression and headache consequent to mild TBI. Repetitive brain injury as in athletes, boxers, football players, hockey players, soccer player and in child abuse victims can lead to crippling deficits over a period of time.

3. Consequences of TBI

This depends on the severity of injury. An individual may be knocked unconscious but that does not necessarily mean the consequences will be serious. When attending hospital you might hear the medical staff taking about Glasgow Coma Scores (GCS) as well as pre and post traumatic amnesia. The GCS is a medical test which scores an individual's response to certain stimuli. It is marked out of 15. 15/15 means someone is completely alert, whereas 4/15 reflects someone who is unconscious. However, just because the initial GCS was low, does not necessarily mean that the consequences will be serious and vice versa. Pre and post traumatic amnesia refers to loss of memory. Pre is before the accident and post is after it. The medical team will therefore want to establish what the last clear memory the injured person had before the accident and what their first is after it. Other common complaints following TBI include headaches, mood swings, problems with memory and concentration, difficulty with multitasking, difficulty with word finding, dizziness, personality changes, seizures, inappropriate behavior, easy fatigability, lack of motivation, being short tempered or less tolerant of others.

4. Medico-legal aspect of TBI (Table 1)

The annual incidence per 100,000 populations is U.S. 506.4, in Europe 235, and in Asia 160 to 344. Long-term disability occurs in 43.19 of individuals discharged after acute hospitalization of TBI. People with disability after TBI in U.S. are about 3.2 million. The total life time cost of TBI in US is around 60.4 billion U.S. dollars. How much of this is a preventable loss if only people stop drunken driving, drunken brawls, and unhealthy speeding to morbidity and death! Thanks are due to the advancement of technology and the use of CT scans and ICP monitoring (Intracranial pressure). In spite of neuroimaging and neuromonitoring 35% approx., mortality remains. From a medico-legal perspective, traumatic brain injuries present a complex questions and issues where not only simply determining who is responsible for the accident is important but also it is important to determine how a TBI affects a victim, physically, mentally, and economically.

Table 1 – Medico-legal issues.

- Dying declaration
- Concussion – Transient unconsciousness
- Lucid interval
- Compression 0 loss of consciousness
- Focal lesions – clinical neuro-deficiencies
- Interventions – Medical/Surgical/both
- Recovery (Total/Partial)
- No recovery (Prolonged coma/Cerebral death/Brain death/Clinical death)
- Incomplete recovery (Disability/Varying degrees/Partial temporary/partial permanent)
- Completely bed ridden
- Loss of life
- Loss of earning
- Inability to do routine work
- Disability assessment
- Compensation problems
- Accident claims
- Industrial claims/occupational claims
- Tort cases
- Criminal cases – simple injury
- Grievous injury
- Dangerous injury

5. Medico-legal guidelines and duties

- Facilitate recording dying declaration.
- Facilitate valid consent from locoparentis/post facto from patient.
- Proper noting of all data from time of entry, identification, history of the incident from patient/relative/police/good-Samaritan. Noting of all relevant procedures and their progress out comes. Appropriate counseling to parent/guardian in regard to diagnosis, investigations, management, progress & possible outcome. After such information to take a signature from the concerned.
- Preserving the case-sheet, investigation reports, etc., in order to prepare certificates required, to prepare from records before attending the court of law on summons.
- To stick to science and personal experience in answering questions from the court (presiding judge), prosecution or the defense.
- To appear before any surrounding forum if required without fail towards helping in delivering justice based on merits in any case.
- Medico-legal duties are part of the duty of the doctor to patient in the Doctor–patient relationship.
- Hiding facts, losing documents, not prompt in obeying and attending upon summon can land the medical man into trouble in terms of payment of compensation, facing prosecution as an accomplice for crime and in some situations even a prison term.

6. Illustrative cases

6.1. Case 1

Injured was aged 22, final year M.B.B.S. student became deaf and dumb due to sustained fracture of pelvis and brain injury. She cannot work as doctor and cannot regain her voice. Tribunal awarded Rs. 3,065,000/- which was upheld in appeal.[1] [B. Anandhi v. R. Latha, 2002 (2) T.A.C. 260: 2002 A.C.J. 233 (Mad.).]

Injured aged 26 years was employed as door checker and cleaner of the bus who sustained 5 lacerated injuries on right temporo-parietal region with underlying depressed fracture causing brain injury. Injured was needed a cranioplasty. Permanent disability gives rise to loss of earning: lacerated injuries on left temporal region and laceration due to brain injury injured suffered loss of earning power. Tribunal awarded Rs. 53,500/- inclusive of Rs. 7500/- for loss of amenities and Rs. 30,000/- for loss of earning power. The award if Tribunal requires no interference and said amount is reasonable compensation for the injuries sustained by injured. [Shajan palliparambil House v. N. Raman Pillai, 1995 (1) T.A.C. 139: 1995 A.C.J. 80 (ker.).]

Injured suffered an injury in the brain leading to a blood clot and the said clot was removed after surgery. Around the brain, bones have been removed to the extent of 4.3″. Injured suffered considerable disability to the extent of 55%. Award Tribunal for Rs. 365,000/-. Was held just and reasonable.6 [New India Assurance Co. Ltd., Chennai v. K. Ganesan, 2005 (3) T.A.C. 182 at. p. 184 (Mad.).]

Injured suffered brain injuries and despite prolonged treatment her memory was impaired. She can speak few words and has slurred speech, she has no control over urinary bladder, she cannot sit or stand of her own and cannot attend to her basic needs and requires assistance. She has become crippled for the rest of her life. She was aged 41, Special Assistant in a bank, drawing Rs. 5587 p.m. and was found medically unfit and her services were terminated by the bank. Tribunal awarded Rs. 800,000/- which was reduced by Appellate Court to Rs. 688,000/-. [Nalina v. M.D., Karnataka Government Insurance Department, 1996 (2) T.A.C. 718: 1996 A.C.J. 758 (Knt.).]

Brain-injured sustained linear fracture of the skull of parietal and temporal bone, lacerated wound over the parietal region on the right side and another wound over the right zygomatic arch: brain injury in the form of cerebral contusion. He remained unconscious for 6/7 days and hospitalized for 22 days and despite treatment, he has suffered loss of memory concentration, thinking and reasoning. Injured was aged 19, student of B.Sc (Nursing) 4th year, unable to concentrate on study and thus his future prospects have been blurred. Tribunal allowed Rs. 192,000/- for loss of earning capacity at the rate of Rs. 1000/- p.m. with a multiplier of 16, Rs. 40,000/- for injury, pain and suffering and Rs. 2000/- for medical expenses, conveyance and nourishment. But, Appellate Court reduced compensation for injury, pain and suffering from Rs. 40,000/- to Rs. 30,000/- and reduced the award from Rs. 234,000/- to Rs. 224,000/-. (Karnataka State Road Transport Corporation v. K. Chandrasekhare Raju, 1999 A.C.J. 1462 (Knt.).]

6.2. Not attending

Neuro-physician – Violent convulsions – Negligence held for not attending to patient despite serious condition – Compensation of Rs. 3 lac awarded against the hospital and Rs. 50,000 against the neuro-physician – The complainant's 13-year-old only son was suffering from epilepsy and was under care of neuro-physician Dr. Nathan. On 4.1.1992, the child started getting violent convulsions, and initially was admitted to another Nursing Home and subsequently in the opposite party's hospital. Here, he continued to have convulsions, developed other serious complications and ultimately expired on 8.1.1992. The State Commission held negligence on part of neuro-physician on following grounds:

- Not attending a serious patient for the reason that it was a Saturday and Sunday;
- On shifting the child to the opposite party hospital on his insistence, he arrived much late to examine and treat the child; he did not arrange any co-ordination between himself and the hospital staff;
- He subsequently visited the hospital at interval of 24 h, despite knowing the serious condition of the child.

After admission the hospital did not make serious efforts to contact the neuro-physician when the condition of the child became serious. When the child was at the verge of collapse, the hospital did not make efforts to request the neuro-physician to stay in hospital to take care of the child. As the hospital was under implied contractual obligation to take reasonable care it was also held liable and was directed to pay Rs. 3 lac towards compensation. The neuro-physician was directed to pay an additional Rs. 50,000/- towards compensation. [Murlidhar Eknath Masane v. Sushrusha citizen Co-op. Hospital Ltd. & Anr., Complaint No. 203/92. Decided on 29.10.1994, by Mah. SCDRC (unreported).]

6.3. Not intubated

Neurology – Polyradiculoneuropathy – Cardiac arrest – Patient in ICCU not intubated in time as instructed – Oxygen tube coming out, not noticed – Negligence held-Hospital held to pay Rs. 2 lac as compensation – The deceased, son of the complainant suffering from acute polyradiculoneuropathy was admitted in the respondent hospital, and he was put on oxygen and was otherwise being monitored in ICCU. A senior consultant in Neurology had given detailed instructions to the staff-in-charge of ICCU. One of the important suggestions was that the patient be intubated immediately, but it was done only after a delay of 2 h, and though the patient was put on oxygen, the nurse did not notice that the oxygen tube had come out. The patient ultimately died of cardiac arrest.

6.4. Held

As a rule, only serious patients are in ICCU and the staff is expected to be extra cautious. That level of caution should have been more, particularly, when staff was attributed with the knowledge that the patient was restless and his condition was deteriorating very fast. No one is sure as to whether the

patient would have pulled through that crisis or even if he had survived, the damage already done by the said disease which had progressed to affect the entire body within a few hours, and was still progressing could be checked or reversed. But, the lack of extra vigilance, at least contributed to the acceleration of the end. There is no evidence to show that intubation would have saved the patient. But, such action may have helped in the treatment. This is most unfortunate that the disease progressed so fast that before the patient could be removed to any center where the latest treatment of plasmapheresis was available the end came. No one can with certainty say if intubation in time would have saved the patient or at least prolonged his left until he could be taken to any other hospital where plasmapheresis facility was available. Nonetheless, such delays and lapse in not noticing the coming out of oxygen tube which was in a way life support system are serious matters for which the hospital administration cannot escape liability. Even if it is argued that there was no callousness on the part of the respondent No. 4 who was the Doctor-in-charge and who accepted the suggestions and recommendations of respondent No. 5 and gave instructions to give effect thereto, it is difficult to overlook the lapses on the part of the staff in the ICCU unit. For that reason the hospital would be liable to compensate the petitioners. Compensation of Rs. 2 lac awarded. [Bhajan Lal Gupta v. Mool Chand Kheraiti Ram Hospital, 2001 (1) CPJ 31 (NCDRC).]

6.5. *Improper treatment*

- Death of complainant's mother aged 63 years admitted in hospital as a case of coma with right hemiplegia caused by intra-cerebral hemorrhage with chronic Hepatitis with cirrhosis liver – An independent witness, a neuro-surgeon of repute deposing that diagnosis and treatment given to patient and management of her case proper and adequate and it was not a proper case for surgery and the choice for medical treatment against surgical therapy in respect of intra-cerebral hemorrhage reasonable and proper choice in the best interest of the patient – plea that surgery should have been performed on the basis of the opinion of a doctor (complainant's witness who is neither a Gastroenterologist nor a Neuro-surgeon nor a Neuro-physician) not tenable – No negligence – Complaint dismissed with costs – Complainant has sought compensation for causing the untimely death of his mother due to gross negligence and the deficiency of service on the part of the Hospital authorities including the doctors and nurses and for mental agony undergone by the complainant and his family during the treatment. Complainant is a bachelor. His father was alive at the time of filing of this complaint. His father or even his brother did not join the complainant in making allegations of negligence etc. Against the Hospital, the doctors and the Hospital staff and seeking compensation as claimed by the complainant, though brother of the complainant was permitted to join at the fag end of the proceedings by order dated 3.12.2001 when arguments heard and orders reserved in the complaint. It is not that he had signed the pleadings or even appeared to support the complainant. Other close relatives of the complainant whose names have come in the proceedings are three doctors. They also do not support the complainant that there were any failings or faults on the part of the Hospital, its staff or the doctors in providing proper medical management services and treatment to the deceased. A team of competent doctors treated the deceased. As a matter of fact any allegation of incompetence or negligence against a doctor cannot be permitted or looked into without making the doctor party in the proceedings. An independent witness Dr. D.K. a reputed Neuro-surgeon whose competence could not even be doubted by the complainant or his witness Dr. S, appeared in the proceedings and testified that the treatment given to the deceased was proper and nothing more could have been done. He also stated that case of deceased was not a fit and proper case for surgery. There was no warrant whatsoever for the complainant to file this complaint making allegations of negligence and incompetence against the Hospital, its staff and the doctors. [Basant Seth & Anr. V Regency Hospital Ltd., OP No. 99 of 1994, decided on 22.1.2002 (NCDRC).]
- Allegation of wrong diagnosis and improper introduction of shunt-CT scan and biopsy reports confirming diagnosis – No active problem after operation and patient periodically visiting doctor for check-up – After almost 11 months, CT scan report showing development of tumor once again – Patient operated again, a shunt inserted from brain through stomach to excretory organs to reduce wound leak and radiotherapy given at the end of which shunt removed and treatment by chemotherapy advised, but patient died subsequently – No negligence in diagnosis nor in insertion and removal of shunt – Seeing the CT scan report, the surgery was performed on 4.11.1992 and the tumor was sent for histopathology report. The histopathology report given by opposite party No. 2 dated 9.11.1992 shows the diagnosis as capillary hemangioblastoma. The report given by appellant on 12.11.1992 gives the details of diagnosis and operation and that left suboccipital craniectomy was done. The follow-up report dated 16.12.1992 shows that removal was done on 4.11.1992 and there was no active problem but there was minimum residual ataxia. After that the patient was periodically visiting the doctor. Therefore, there was no deficiency in the first diagnosis and the removal of the tumor.
- On 7.10.1992 after almost 11 months, CT scan showed capillary hemangioblastoma and that once again there was done calcification and multiseptated mass lesion noted in the left cerebellar hemisphere and pressure effect was seen on the left ambient cistern. Hence the patient was operated again on 25.10.1993 and to drain the pressure of hydrocephalus a shunt was placed. The histopathology report dated 31.10.1993 confirmed the diagnosis of "recurrent capillary hemangioblastoma". Therefore, while the shunt was in place, the patient was sent for radiotherapy and after the course was over the shunt was removed and further treatment by Chemotherapy advised. Therefore, the shunt was kept for a short period. As per discharge note of C.D.R. hospital, dated 22.1.1994 "Shunt done post-operatively to reduce wound leak Shunt function was good. Post-operative period uneventful. Shunt removed". Hence, there was no deficiency on this ground also.
- The histopathological report showed recurrence of ependymoma which means malignant mass, hence radiotherapy

was advised. Only after completing the radiotherapy, the shunt was removed; hence it is not correct to say that the shunt was improperly introduced. Hence there was no negligence on the part of the opposite parties as they could never give guarantee for full recovery but only encouraged the complainants so that they would follow the treatment properly. [(Dr.) K. Sridhar v. Budda Lakshmikantham, 2003 (3) CLD 207 (AP SCDRC).]

6.6. *Wrong treatment*

- Neuro-surgery – Wrong treatment – Fracture of skull in accident – Patient in coma admitted in government hospital – X-rays taken before admitting as inpatient showed linear fracture of skull, but CT scan report from another hospital showed "no bone injury is noted" – Doctors of neuro-surgery Department attending the patient opining no surgery necessary, and medical treatment continued – Complaint alleging that the CT scan report given negligently due to inexperience of technician or defect in the scan machine and the patient treated wrongly on the basis of said report resulted in death of patient – Complainant failing to establish that the CT scan report influenced the doctors to change the line of treatment – No negligence or deficiency in service on the part of opposite parties – The third opposite party is Superintendent, Gandhi Hospital, Secunderabad which is a Government hospital treating the patients free of cost and as such no relief can be granted against the third opposite party and the complaint is accordingly dismissed against the third opposite party.
- The complainant's husband was in coma when he was admitted inpatient in the third opposite party hospital. The doctors examined him in the casualty and before admitting him as inpatient X-ray were taken. On the basis of the X-ray and also on the clinical condition of the patient treatment was started. As per the case-sheet the patient was in coma when he was examined by the duty doctor (Neuro-Surgeon) and he never regained consciousness. No doubt CT scan did not show the skull fracture. The post-mortem report discloses that there was Epidural blood clot over the right temporal lobe of the brain underneath the fracture site and subdural blood clot over left frontal and left temporal areas. Epidural blood clots and subdural blood clots must have developed sometimes after CT scans and they are not mainly responsible for his death.
- X-rays taken in the third opposite party hospital have shown the skull fracture Even though CT scan report did not disclose the same and the doctors of Neuro-surgery Department are aware of the skull fracture and opined that the surgery was not necessary but medical treatment continued. Even in the CT scan reports if a mention was made that there was fracture which was already known to the third opposite party doctors the line of treatment would not have been changed. The Neuro-surgery doctors who were attending on the patient after seeing the X-rays, skull and also the condition of the patient advised for CT scan to know further details of the injury to the brain. Even the Consultant Radiologist expressed the same opinion. He denied the suggestion that the reason for non-detection of 10 cm, linear skull fracture was missed in CT scan report due to inexperienced hand of the technician or due to defect in the CT scan machine. He too asserts that there would not be any change in the line of treatment if there is skull fracture.
- The opposite parties 1 and 2 stated that linear fractures may be missed at CT scan if the line is parallel to the place of sections obtained. The second opposite party also states in his written version that CT scan is not the only criteria in the decision process and management in head injury trauma. There will be assessment of plain radiographs as well as physician's own clinical findings. So from this evidence the absence of the skull fracture in the CT scan is neither due to inexperience of the Radiologist nor has the effect of change in the line of treatment, as all the opposite parties have stated in one voice that Neurology Department doctors have noticed the skull fracture in the X-rays and as such the absence of skull fracture in the CT scan does not in any way affect the line of treatment or management of the patient.
- The complainant failed to establish the fracture of skull in the CT scan report influenced the doctors in any way which resulted in wrong line of treatment or management of the patient. Having regarded to these circumstances no negligence can be attributed to the opposite parties 1 and 2. [G. Bala Saroja v. C.D.R. Hospital, 2003 (2) CLD 198 (AP SCDRC).]

6.7. *Patient infection*

Neuro-surgery – Anterior cervical discectomy C4–C5 with removal of osteophyte and cervical fusion – Patient contacting pseudomonas infection – Allegation of unhygienic conditions in the hospital – Line of treatment adopted by Ops not disputed nor the necessity of surgeries performed, nor is there any complaint of any defect in performing those surgeries – Patient not in the hospital during the relevant period he contacted infection – Every possibility that he contacted the infection endogenously – HAI (Hospital Acquired Infection) not proved by complainant – Held, no negligence or deficiency in service – Even assuming that in some cases there is proof about Hospital Acquired Infection (HAI) sometimes even in best maintained hospitals also there may be likelihood of such bacteria being transmitted in considerable percentage of patients. Unless the complainant is able to establish that the hospital authorities were negligent in maintaining the hospital in high degree of aseptic conditions with sterile and disinfected theatres, it cannot be said that there is negligence on their part. The opposite parties assert that the hospital is run under highly hygienic and disinfected conditions. The complainant has failed to establish that there is any deficiency in service on the part of the opposite parties. [B. Mahidhar Reddy v. Apollo Hospitals, 2003 (6) CLD 373 (AP SCDRC).]

7. Conclusion

Expert medical advice is increasingly being sought in relation to criminal, insurance, personal injury and negligence issues. The relationship between evidence-based guidance and the determination of medical negligence is complex,[1] a doctor is not guilty of negligence if he has acted in accordance with a practice accepted as proper by a responsible body skilled in

that particular art in essence and it is of utmost importance whether standard practice was followed or not.

Conflicts of interest

All authors have none to declare.

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