



OTONEUROLOGICAL ASSESSMENT IN HEAD TRAUMA

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ABSTRACT

Introduction: Head injury is one of the most common cause of neurological disorder in modern era. Temporal bone fracture occurs most commonly due to head injury may it be, blunt or penetrating. This study aims at determining auditory and vestibular findings to assess incidence of otoneurological dysfunctions post head injury. **Methodology:** A prospective study was carried out on 50 patients attending at P.B.M. Hospital, S.P. Medical College, Bikaner, from 01st Oct. 2015 to 30 Sept 2016 with clinical diagnosis of head trauma, mild as well as severe head injury. The 25 normal healthy controls was assessed, simultaneously. **Result:** Out of 50 patients included in this study, 19 patients were having complain of hearing loss. 10 case having traumatic perforation. 24 cases showed positive Fukuda's writing test. 20 cases complaint of tinnitus following head injury. **Conclusion:** Most common age group having head injury was found to be 21-40 years (54%). Traumatic perforation of TM was seen in 10 patients on otoscopy while 16 cases had ear bleeding post head injury. Hearing loss was quite a common finding 38%. While 40% suffered from tinnitus after head injury.

KEYWORDS : Head trauma , otoneurological, traumatic perforation.

INTRODUCTION

In the modern era head injury is one of the most common cause of neurological disorder worldwide, which include road traffic accident (55%), assault (11%), agricultural (9%). There occur 10% road traffic accidents in India, of all road traffic accidents worldwide. Head Injury results in 32% of all cases of road traffic accidents (Arvind kumar et. al 2008).

Temporal bone fracture occurs most commonly due to head injury may it be, blunt or penetrating. The indispensability of high resolution techniques and the limited possible scans, (axial or coronal) in cases of acute trauma are some of the other concerns which makes it necessary to have in depth knowledge of normal temporal bone anatomy.

This study aims at determining auditory and vestibular findings to assess incidence of otoneurological dysfunctions post head injury. Complete and accurate otoneurological assessment warrants knowledge of normal ear anatomy.

MATERIAL & METHODS

This study was carried out on 50 patients attending at P.B.M. Hospital, S.P. Medical College, Bikaner, from 01st Oct. 2015 to 30 Sept 2016 with clinical diagnosis of head trauma, mild as well as severe head injury. The 25 normal healthy controls was assessed, simultaneously.

Inclusion criteria:

Patients of all age group and sex coming to P.B.M. Hospital, Sardar Patel Medical College, Bikaner with a history or/and clinical examination suggestive head injury.

Exclusion criteria:

Patients with past history of audiological or other systemic diseases.

These localizing tests was include Standing test, Gait test, Unterburger's/ Fukuda test, Past-pointing test, Romberg's test, Fukuda's Writing test, Finger Nose test, Babinski- Weill test, Cold-Caloric tests, Barany's Pointing test.

RESULTS:

This study was carried out on 50 patients attending at P.B.M.

Hospital, S.P. Medical College, Bikaner. In this study maximum number of patients (54%) of head injury included in our study were of age group 21-40 years.

Table - 1: Percentage of cases with vertigo

S. No.	Age of Patients	No. of patients	Number of patients with vertigo	
			No.	%
1	1-20	10	6	12%
2	21-40	27	10	20%
3	41-60	13	8	16%
	Total	50	24	48%

Table no. 1 shows out of 50 patients 24 (48%) patients were having complain of vertigo and 20% of these cases were of age group 21-40years. Out of 24 cases of vertigo 17 were Male and 7 were Female. Total number of Male patient were 39 and of Female were 11. Thus the incidence of vertigo after head injury was more in female. Out of 50 patients included in this study, 19 patients were having complain of hearing loss out of which 14 patients were Male and 5 were Female. 16 patients out of 50 patients included in our study were having complaint of ear bleeding after head trauma.

10 cases out of 50 patients of our study were having traumatic perforation after head injury.

Table 2: Type of hearing loss (based on Pure Tone Audiometry)

S. No.	Age of Patients	No. of patients with hearing loss	CHL & SNHL		CHL		SNHL	
			No.	%	No.	%	No.	%
1	1-20	4	2	4%	1	2%	1	2%
2	21-40	4	0	0	2	4%	2	4%
3	41-60	11	3	6%	5	10%	3	6%
	Total	19	5	10%	8	16%	6	12%

Total 19 patients included in present study suffered from hearing loss out of which 8 patients were of conductive hearing loss, 6 patients were of sensori-neural hearing loss and 5 patients were of mixed hearing loss.

In BPPV, gait test is mostly negative.

Past pointing test was negative in all cases of BPPV in our study.

Finger nose test was also negative in all cases of BPPV. Out of 50 cases included in present study, 24 cases (18 male, 6 female) showed positive Fukuda's writing test while 26 cases (21 males, 5 females) showed negative Fukuda's writing test.

Out of 50 cases, 24 cases (18 male, 6 female) were positive positional test and 26 (21 male, 5 female) were negative positional test. In the present study there were 5 cases of temporal bone fracture in the CT Scan report.

Table III: Tinnitus

S.No.	Age of Patients	No. of patients	Tinnitus present	Tinnitus absent	Unilateral	Bilateral
1	1-20	10	6	4	6	0
2	21-40	27	7	20	6	1
3	41-60	13	7	6	5	2
	Total	50	20	30	17	3

In present study, 20 cases complaint of tinnitus following head injury out of which 17 cases were of unilateral tinnitus and 3 cases were of bilateral tinnitus.

DISCUSSION

This study was carried out on 50 patients attending at P.B.M. Hospital, S.P. Medical College, Bikaner. The most commonly affected age group was found to be 21-40 years (54%) in this study while similar study done by **Podoshin (1975)** the most commonly affected age group was 10-19 years.

Incidence of hearing loss post head injury was 38% in this study while it varied from 17.9% **Gurdjian (1933)** to 56% **Griffith (1979)** in various studies. CHL (16%) was more common than SNHL (12%) while mixed hearing loss was present only in 10% cases.

Ear bleeding was present in 32% cases while tympanic perforation was present in 20% cases. 8% cases suffered from facial nerve paralysis post head trauma in this study while **Marenda and Olsson (1997)** showed that 8 to 22% cases of facial paralysis were due to traumatic injury. Incidence of facial nerve paralysis was less than fracture of temporal bone. Post head injury vertigo was seen in 24 cases (48%) in this study. A study conducted by **Berman and Fredrickson (1978)** on vertigo after head injury showed that vertigo was a significant symptoms in 34% of minor head injury and 50% moderate cases. Incidence of vertigo after head injury was more in female.

10% cases were found to have temporal bone fracture. While **Waldron J and Hurley S.E. (1988)** showed that 12% to 20% cases had fracture temporal bone due to traumatic head injury.

Post head injury Tinnitus was seen in 40% cases in this study. A study conducted by **Rosalyn A Davies and Linda M (2007)** on Tinnitus and Dizziness after head injury showed that Tinnitus was a significant symptoms in 36% to 44% cases. Vestibular nerve fibre stretching in internal auditory meatus was responsible for vertigo without temporal bone fracture.

CONCLUSION

This study was carried out on 50 patients attending at P.B.M. Hospital, S.P. Medical College, Bikaner, from 01st Oct. 2015 to 30 Sept 2016 with clinical diagnosis of head trauma, mild as well as severe head injury. The 25 normal healthy controls was assessed, simultaneously. Most common age group having head injury was found to be 21-40 years (54%). Traumatic perforation of TM was seen in 10 patients on otoscopy while 16 cases had ear bleeding post head injury. Hearing loss was quite a common finding 38%. Deafness was of conductive type

in 16% while 12% had SNHL and 10% had mixed hearing loss. 20 cases (40%) suffered from tinnitus after head injury. Half of the subjects i.e. 24 cases (48%) suffered from vertigo and it was observed that BPPV was more common among females.

Clinical profile showed negative gait test, past pointing test and finger nose test while positive Fukuda writing test and Dix-hall pike test in all 24 cases of vertigo suggesting BPPV as the cause of vertigo.

Temporal bone fracture was seen in 5 cases. The study shows that vertigo of Benign Paroxysmal Positional Vertigo (BPPV) is commonest variety of peripheral vertigo after head trauma. However, majority of these patients also had post-traumatic otoscopic and audiometric abnormalities like traumatic perforation of tympanic membrane and hearing loss respectively. Conductive hearing loss was more common than sensorineural hearing loss following head trauma.

Conflict of Interest: None.

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