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A PROSPECTIVE STUDY OF APHASIA IN HEAD INJURY

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ABSTRACT

Introduction Aphasia in head injury is a well known entity, even then there are only few reports available in the literature. It is an acquired lesion of the dominant cerebral hemisphere, due to the impairment of comprehension or production of language in written or spoken forms. Aphasia is considered an important consequence of head injury as it compromises interaction between the patient and others. Aphasia in head injury consists of a large spectrum of communication deficits. It is not known for certain why trauma in the same area of the head produces an anomic aphasia in some patients, Wernicke's aphasia in others, and in some it produces no aphasia. In the recent 10 years with the development of modern neuroimaging and cognitive neurosciences, clinical aphasia research concerned with cerebral dominance, the influence of handedness, and the mechanisms of recovery have been re-explored. Hence an attempt is made in this study, to study types of aphasia, its clinical presentation and outcome in post traumatic patients.

Materials and methods All head injury patients who stabilized within 24 hours and admitted in Rajiv Gandhi Government General Hospital, between august 2010 and March 2013, were screened for aphasia. Patients who strictly completed the bedside screening test and found to have aphasia were included in this study. Based upon the above exclusion criteria, after exclusion 3015 patients were completed Frank Benson and Norman Geschwind Bedside Language screening test. 67 patients were found to have aphasia their details were entered into the proforma and master chart was prepared and analysed. Clinical examination including CT scan brain plain findings at that time of admission were included. Screened patients were further evaluated with Western Aphasia Battery (WAB) scoring. After applying WAB scoring aphasia patients were classified in to eight different subtypes of aphasia. During follow up, patients were revaluated by WAB test and those who scored AQ more than 93.8 were declared to have recovered from aphasia. Based on the above data a master chart was prepared and the same analyzed using SPSS software. For the statistical analysis chi-square ,pearson formula was used.

Results- In this study on post traumatic aphasia leads to the following conclusions. The incidence of aphasia in mild head injury patients was 2.22% most commonly in the third decade of life with males more commonly affected and anomic aphasia was the most common with recovery being more commonly seen.

KEYWORDS : Head injury, post traumatic sequelae, anomic aphasia Western Aphasia Battery.

INTRODUCTION

Aphasia is defined as a disorder of language that is acquired secondary to brain damage, adapted from Alexander and Benson (1997). Aphasia is distinguished from congenital or developmental language disorders, called dysphasias. Aphasia in head injury is a well known entity, even then there are only few reports available in the literature. It is an acquired lesion of the dominant cerebral hemisphere, due to the impairment of comprehension or production of language in written or spoken forms. Aphasia is considered an important consequence of head injury as it compromises interaction between the patient and others. Aphasia in head injury consists of a large spectrum of communication deficits. It is not known for certain why trauma in the same area of the head produces an anomic aphasia in some patients, Wernicke's aphasia in others, and in some it produces no aphasia.Paul Broca is regarded as the founder of modern aphasiology. The classic Lichtheim-Geschwind triangle model has a motor processing area (Broca's), an auditory processing area (Wernicke's), and an unlocated conceptual area (Lichtheim, 1885; Geschwind, 1967). However, their common association with the task of processing syntactic information may also indicate that language processing is a very complex and multi-faceted task, and that the triangle model is too simple.In the recent 10 years with the development of modern neuroimaging and cognitive neurosciences, clinical aphasia research concerned with cerebral dominance, the influence of handedness, and the mechanisms of recovery have been re-explored.Hence an attempt is made in this study, to study types of aphasia, its clinical presentation and outcome in post traumatic patients.

AIM OF THE STUDY

Aim of the study is to to identify incidence and course of aphasia in patients with head injury and the factors influencing the recovery of aphasia and to analyze the final outcome of aphasia in patients with head injury.

MATERIALS AND METHODS

All head injury patients who stabilized within 24 hours and admitted in Rajiv Gandhi Government General Hospital, between august 2010 and March 2013, were screened for aphasia. Patients who strictly completed the bedside screening test and found to have aphasia were included in this study.

EXCLUSION

1. Unconscious patients, disoriented patients.
2. Patients who were unable to complete the beside screening test because of other complications like bilateral periorbital edema, facial injury, both upper limb fracture.
3. Patients discharged against medical advice.
4. Absconded patients.
5. Children age less than 12 years.
6. Previous speech disorder and motor speech disorders were **excluded** in this study.

Date of injury, time interval between injury and hospitalization, mode of injury, GCS, handedness were noted in the clinical examination including bilateral pupil size & its reaction to light, history of LOC, ENT bleeding, seizure, vomiting, weakness limbs, other organs injured were noted. CT scan brain plain findings at that time of admission were included.Screened patients were further evaluated with Western Aphasia Battery (WAB) scoring. After applying WAB scoring aphasia patients were classified in to eight different subtypes of aphasia.Most of the patients admitted in our hospital were managed with antiedema measures, antiepileptics, analgesics and antibiotics. Hospitalisation days varied from 4 days to 35 days. Patients were discharged after clinical and radiological improvement and advised to review in our hospital every week. Weekly review in the first month followed by monthly visit was done. During follow up, patients were revaluated by WAB test and those who scored AQ more than 93.8 were declared to have recovered from aphasia. The recovery of aphasia was analysed with factors like mode of injury, time of hospitalisation, duration of LOC, CT brain findings and subtypes of aphasia.

OBSERVATIONS AND RESULTS

3015 patients with head injury were screened and 67 were diagnosed to have aphasia. The incidence of aphasia was 2.2% in head injury patients. Among these, 77.6% were males and 22.4% were females. Thirty eight years was the mean age, the range being from 14 to 69 years. About one third of the patients were between 21 to 30 years of age. patients with extremes of age (13-20 & 61-70) least commonly had aphasia.[Table 1]. Mode of injury includes road traffic accident (RTA), fall at surface level (FALL), fall from height, assault, fall of

heavy object. 68.66% of aphasia were due to RTA. Second most common cause was fall at surface level (17.9%). Most of the patients with FALL developed anomic aphasia(Table 2) .But anomic aphasia was most commonly due to RTA

There is delay in time between injury(Table 3) and hospitalisation & management. In this study, the time interval between injury and treatment varied from 1 hour to 78 hours. For the purpose of analysis, the time interval was divided every 6 hours up to 24 hours, remaining were classified as more than 24 hours group. 61.2% were admitted within 6 hour. Only 20.9% were admitted after 24 hours. All patients were right handed. Though 89.5% of the head injury patients had loss of consciousness, majority (71.6%) had only for short period of time (less than 2 hours). 10.5% were not associated with loss of consciousness. Most of the patients (89.55%) did not have LOC.10 patients had history of vomiting, one patient was associated had seizure. Six patients were associated had history of ear bleeding. Most of the mild head injury patients (40.3%) suffered anomic aphasia. 25.4% and 23.9% had Broca's and Wernicke's aphasia respectively. Transcortical aphasia was the least common form of aphasia.[Table 4]

Out of 67 patients, 27 were found to have anomic aphasia. 14 patients were males and 3 were females.15 patients were managed conservatively and two were operated. Of these two, one patient underwent Left Temporoparietal craniotomy for extradural haematoma (*EDH*) and other had wound debridement for depressed fracture. All patients with anomic aphasia recovered.

BROCA'S APHASIA-Seventeen cases were found to have Broca's aphasia. 11 patients were males and 6 were females. 16 patients were managed conservatively, one underwent wound debridement for depressed fractures. All patients with Broca's aphasia recovered. Localization of Broca's aphasia corresponds to Left frontal lobe (suprasylvian region). 12 patients had frontal lobe lesion. While 5 patients did not have frontal lobe lesion. 2 patients had perisylvian SAH, one had diffuse cerebral edema and 2 cases had left temporal lobe contusion. Among the 2 patients with SAH and one with diffuse cerebral edema recovered within 6 day

WERNICKE'S APHASIA-Sixteen cases presented with Wernicke's Aphasia. 13 patients were males and 3 were females. All were managed conservatively. Except one patient, others recovered in four months of follow up. All had left temporal brain contusion. Three patients recovered while three patient did not recover till 3 months of follow up. All patients had left temporal brain contusion, two were operated, of them one patient underwent Left Temporoparietal craniotomy for acute subdural haematoma (*SDH*), and the other underwent wound debridement for depressed fracture.

TRANSCORTICAL SENSORY APHASIA.-Transcortical sensory aphasia was diagnosed in a 40year old man with compound depressed fracture of left frontotemporal bone following assault. Wound debridement was done for him and he recovered.(See Table 5)

APHASIA QUOTIENT (AQ) **(**Table 6, 7) AQ varied from 18 to 78, calculated median value of AQ was 58. Global aphasia had low mean AQ value (26.33). *Transcortical sensory aphasia* had high AQ value (68). AQ value among the non recovery group was less than the mean value. The lesions were most commonly located in the left cerebral hemisphere. Contusion especially in the left temporal lobe (52.2%) was the most common finding. 29.8% had frontal lobe contusion (second MC).91% were managed conservatively .9% were managed surgically.During follow up, AQ scores above 93.8 considered as recovered from aphasia.

Among 67 aphasia patients, 29 recovered within a week. Within a month, 61 recovered. Two patients were recovered between 31 – 60 days of injury. Four patients did not recover even after 3 months of follow-up.(Table 8)

Among the four patients who did not recover, 2 had injury due to fall, other modes were road traffic accident and fall from height. Road traffic accident and Fall injury patients had delayed recovery.

97.6% of the patients admitted within 6 hours of injury showed recovery within a month. All patients to whom treatment was started within twenty four hours showed complete recovery. 28.6% of the patients admitted after 24hours did not recover on follow up even after 3 months. The relationship between loss of consciousness and recovery was statistically significant (P-0.000). All patients without loss of consciousness and 97.9% of patients with history of loss of consciousness less than 2 hours recovered within a month. Aphasics who did not recover had loss of consciousness for more than 2hours.

48.3% of anomic aphasia and 31% of Broca's aphasia recovered within a week. Patients with Wernicke's aphasia recovered late. Three patients (50%) with Global aphasia and one with Wernicke's aphasia (6.25%) did not recover after 3 months of follow-up.

CONCLUSION

In this study on post traumatic aphasia leads to the following conclusions. The incidence of aphasia in mild head injury patients was 2.22%. Most commonly found in patients who are in their third decade of life. Males were more commonly affected than females. RTA was the most common mode of injury. Anomic aphasia was the most common subtype of aphasia. Location of lesions found in CT brain were not consistent with the expected subtype of aphasia. Most of the patients recovered. Mode of injury, duration of LOC, time interval between injury and hospitalisation and the subtypes of aphasia significantly influenced the time taken for recovery of aphasia.

OBSERVATIONS AND TABLES

TABLE 1 SEX DISTRIBUTION

AGE	SEX		TOTAL
	MALE	FEMALE	
13-20	4	1	5
21-30	18	3	21
31-40	10	2	12
41-50	8	4	12
51-60	8	4	12
61-70	4	1	5
TOTAL	52	15	67

TABLE 2 ANALYSIS OF MODE OF INJURY AND TYPE OF APHASIA

Type of aphasia	Mode of injury					Total
	Assault	Fall	Fall from height	Fall of heavy object	Rta	
ANOMIC	1	8			18	27
BROCA'S	2	2		1	12	17
GLOBAL	-	1	1		4	6
WERNICKE'S	1	2	1		12	16
TRANSCORTICAL	1	-			-	1
SENSORY						
TOTAL		5	13		46	67

TABLE 3 ANALYSIS OF TIME INTERVAL

TIME INTERVAL	TOTAL
1-6 HOURS	41
7-12 HOURS	8
13-18 HOURS	1
19-24 HOURS	3
ABOVE 24 HOURS	14
Total	67

TABLE 4

APHASIA SUBTYPES				
Anomic	Broca's	Global	Wernicke's	Transcortical sensory
27	17	6	16	1
40.3%	25.4%	9%	23.9%	1.5%

TABLE 5

AGE	TOTAL APHASIA PATIENTS		ANOMIC APHASIA		BROCA'S APHASIA		WERNICKE'S APHASIA		GLOBAL APHASIA	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
13-20	4	1	1		3	1				
21-30	18	3	8	2	4		4		2	1
31-40	10	2	4			2	3		2	
41-50	8	4	5	2		1	3	1	1	

51-60	8	4	2	1	2	2	3	1		
61-70	4	1	2		2			1		
TOTAL	52	15	22	5	11	6	13	3	5	1

TABLE 6

APHASIA QUOTIENT				
Anomic	Broca's	Global	Wernicke's	Transcortical sensory
60.74	56.47	26.33	59.75	68

TABLE 8

Recovery	MODE OF INJURY					Total
	Assault	Fall	Fall from height	Fall of heavy object	RTA	
1-7 DAYS	2	5	1	1	20	29
8-30 DAYS	3	6	0	0	23	32
31-60 DAYS	0	0	0	0	2	2
NOT	0	2	1	0	1	4
RECOVERED	5	13	2	1	46	67

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