IJBPAS, February, 2020, 9(2): 282-291

ISSN: 2277–4998

International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)

'A Bridge Between Laboratory and Reader'

www.ijbpas.com

EFFECT OF TRAUMA ON NEUROPSYCHOLOGICAL IMPAIRMENT AND ATTENTION

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Received 28th Aug. 2019: Revised 17th Sept. 2019: Accepted 10th Oct. 2019: Available online 1st Feb. 2020

https://doi.org/10.31032/IJBPAS/2020/9.2.4970

ABSTRACT

The aim of Current study is to investigate the effect of trauma on attention and neuropsychological impairment among survivors of trauma. Population of study included male and female of the age of 20 to 30 years from lady reading hospital Peshawar. Sample size for present study was 200 (100 Traumatic Patients and 100 non traumatic persons) selected conveniently. Two scales Neuropsychological impairment scale and Moss Attention scale were used for data collection. These scales were standardized and valid and reliable and were used after proper permission.

t-test were used to analyze the results. The results show significant difference between traumatic and non traumatic individuals on attention scale and on neuropsychological deficit scale at the level of p<.000. The conclusion of the study is that the attention and neuropsychological deficits are more disturb among traumatic patients as compare to the non traumatic individuals. Implications of the study are that the problem of the traumatic patients that is attention and neuropsychological deficits should be treated to enhance the well being of traumatic individual.

Key words: Trauma, Neuropsychological Impairment, Attention

INTRODUCTION

Traumais an emotional response to a terrible event like an accident, bomb blast or natural disaster, death. Trauma is a very difficult or unpleasant experience that causes someone to

have mental or emotional problems usually for a long time. Trauma can effects individual neuropsychological functioning also as a result of which individual cannot perform normal in the daily life.

A neuropsychological deficit refers to when brain spinal cord muscles or nerves are unable to perform their function. Neuropsychological deficits include cognitive problem, learning problem, sensory motor perception problem and depression. Cognitive deficits refers to when the cognitive functions of an individual impairs up to that point that he or she is unable to perform well in the environment or society and treatment is necessary for normal functioning. Some common cognitive disorders include Dementia, Developmental disorders, Motor skill disorders, Amnesia, Substance-induced cognitive impairment **(Psych Guides, 2016)**. Learning refers to some change in behavior as a result of some experience so learning deficit refers to the impairments of an individual in the processes related to perceiving, thinking, remembering or learning **(Learning Disabilities Association of Canada, 2015)**. Another study indicates depression is a common and serious psychological illness depression negatively affects the individual's feelings, the way he thinks and how he act **(Parekh, 2017)**. Different studies have been conducted on neuropsychological deficits caused by trauma. **Saigh *et al*. (2006)** found that trauma-exposed youth performed less on verbal, but in performance they are well). Deficits in learning and verbal memory may develop as a response of some chronic trauma **(Bremner *et al*., 1995; Yehuda *et al*., 1995). Yang and Clum (2000)** used some structured equation analysis which showed that "early negative life events" have a strong impact on cognitive deficits. Cognitive deficits such as poor problem solving, (unable to think things out or make sense of what is happening), low self-esteem how one thinks of oneself – victim-thinking and hopelessness (loss of future orientation) have all been clearly linked to negative (traumatic) life events **(Stein & Kendell, 2004; LeDoux, 2002; Schore, 2001; Teicher, 2000; Yang & Clum, 2000)**.

Additionally, depressive symptoms due to some trauma independently affect cognitive performance **(McAllister-Williams *et al*., 305 1998)**. Trauma and depression are very often co-morbid, including at the early aftermath of traumatic events **(Shalev 298 *et al*., 1998)**. One of the main problem individual experience loss of motor activities which is main sign of PTSD so attention, agitation, exaggerated withdrawal, loss of

small motor activities; like being unable to unlock a door, make a phone call, unable to talk (stuttering), unable to sleep, are common behaviors in response to trauma **(Le Doux, Romanski, and Xagoraris, 1991)**.

Attention indeed refers to the mental process by which external or internal input is transformed, reduced, elaborated, stored, recovered, and use **(Neisser, 1967)**. Traumatized patients may experience deregulated attention, which manifests as inattentiveness such as disturbed concentration on one hand and over-attention to potential threat (i.e., hypervigilance) on the other. Beyond trauma-related memory, the traumatized individual has been suffered with measurable impairment of memory and attention **(Wolfe and Schlesinger, 1997)**. **Vasterling *et al.* (1998)** showed deficiencies in sustained attention, acquisition of new information in traumatized patients. Deficits in attention and working memory have been interpreted in the individual that have experienced some trauma **(Vasterling *et al*., 1998)**. Traumatic individuals after suffering from bad experience and in result of that the stress induces the release of glucocorticoids, such as cortisol, that can damage the left Hippocampal area of the brain, increasing memory and attention deficit **(Perry & Szalavitz, 2006; Bremmer, 2001)**. Trauma has been associated with subjective complaints of poor concentration, attention and memory **(Klonoff *et al*., 1976; Goldfield *et al*.1988)**. There is attention deficit in PTSD patients **(Gilbertson *et al*., 1997; Vasterling *et al*., 1998)**.

METHODOLOGY

Objective:

- To determine the effect of Trauma on Neuropsychological Impairment
- To check the effect of trauma on attention

Hypothesis

- There will be a mean score difference on neuropsychological impairment of traumatic patient than non traumatic patients
- There will be a mean score difference on attention of traumatic patient than non traumatic Trauma will significantly associate with neurological deficit.

Variables of the study

Variables included in the study are attention and neuropsychological deficits.

Operational definitions

Neuropsychological deficits

.It is defined as impairment in cognitive functioning (Memory, abstract reasoning, problem solving ability, and orientation) and it affects behavior of a person. In the present

study neurobehavioral problems will be measured through Neuropsychological impairment scale (NPIS). Those who scored 184 they were considered high neuropsychological impairment

Attention:

It refers to when an individual focuses on the particular traits of stimulus and ignore the rest of stimuli is called attention.

Sample

The sample consisted of the total two hundred (N=200) traumatic patients and non traumatic patient with age range of 20 - 30 years. It consisted of one hundred (n=100) traumatic patients and one hundred (n=100) non patients from LRH Khyber Pakhtunkhwa. Traumatic patient were comprised of all the survivors of trauma. Non traumatic were selected randomly from the normal populations schools Peshawar (Khyber Pakhtunkhwa). Convenient sampling technique was used for selection of sample.

Procedure of the study

Before collecting the data formal permission had been taken from the high authority. After identifying the Traumatic patients and non-traumatic patients informed consent or permission will be taken from hospital of Peshawar i.e. Lady Reading Hospital Trauma Center while non traumatic individuals were randomly collected from normal population. Rapport was established and the subject was briefed about the aims and objectives of the study. After the formal consent was taken, self administer questionnaires and scales will be given to the patients. Instruction were readout to the subjects before administering the questionnaire and if needed further explanation was given to make sure the clarity of the questionnaire by respondents. After getting the questionnaires back, they were thanked for their participation. Data collected were subjected to statistical analysis.

Research instruments

In the study two questionnaires and demographic sheet was used:

Demographic Questionnaire

Demographic questionnaire include name, age, education, marital status, duration of trauma, type of trauma, family support and socio economic status

Neuropsychological Impairment Scale (NPIS)

The Neuropsychological Impairment scale used in the main study comprised of 46 items. The dimensions and item are as follows. The emotional problem dimensions consist of 10 items. The learning problem consists of 6 items. The problem in sensory and memory problems it has 8 items. The

Mental and the physical incoordination consist of 4 items. The rest of the items have been derived from **Siddiqui-shah (1977)** Depression scale, SSD (12 items).

Moss Attention Rating Scale

The Moss Attention Rating Scale (MARS) was developed by John Whyte, MD, PhD, Tessa Hart, PhD, and colleagues at the Moss TBI Model System at Moss Rehab Hospital and Moss Rehabilitation Research Institute. Moss Attention Scale consists of 22 items. Each item is a behavioral descriptor rated on a 5-point Likert-type scale according to how well that behavior describes the patient, ranging from "definitely true" to "definitely false." Items are phrased so that the rater considers behaviors indicative of both good and impaired attention. Half the items relate to the 3 correlated factors found for the MARS: Restlessness/ Distractibility, Initiation, and Sustained/ Consistent Attention.

RESULTS

Table 1 shows the difference between traumatic and non traumatic on neuropsychological impairment scale. The result shows significant difference between traumatic and non traumatic. Traumatic (M= 114.2, SD= 17.42) Scored lowered than non traumatic (M=72.42, SD=26.63), t(198)=197 with mean difference p<.000, d;1.84, Cl 95% [35.45, 48.10]. The effect size for the analysis was found to exceed Cohen's 1988 convention for large effect size.

Table 2 shows the difference between traumatic and non traumatic on attention scale. The result shows significant difference between traumatic and non traumatic. Traumatic (M= 67.43, SD= 3.82) Scored lowered than non traumatic (M=61.0, SD=26.63), t(198)=197 with mean difference p<.000, d;0.33, Cl 95% [4.89, 7.96]. The effect size for the analysis was found to exceed Cohen's 1988 convention for large effect size (80).

Table 3 shows the difference between traumatic and non traumatic on subscale learning problem of neuropsychological impairment scale. The result shows significant difference between traumatic and non traumatic. Traumatic (M=12.4, SD=1.589) Scored lowered than non traumatic (M=7.74, SD=3.00), t(198)=197 with mean difference p<.000, d;0.33, Cl 95% [3.99, 6.33]. The effect size for the analysis was found to exceed Cohen's 1988 convention for large effect size (80).

It shows the difference between traumatic and non traumatic on subscale sensory motor perception on neuropsychological impairment scale. The result shows significant difference between traumatic and

non traumatic. Traumatic (M=11.25 , SD=2.00) Scored lowered than non traumatic (M=7.6, SD=3.37), t(198)=197 with mean difference p<.000, d;1.31, Cl 95% [2.79, 4.34]. The effect size for the analysis was found to exceed Cohen's 1988 convention for large effect size (80).

Table shows the difference between traumatic and non traumatic on subscale cognitive problem on neuropsychological impairment scale. The result shows significant difference between traumatic and non traumatic. Traumatic (M=16.34 , SD=2.52) Scored lowered than non traumatic (M=10.84, SD=3.76), t(198)=197 with mean difference p<.000, d;1.32, Cl 95%[4.60 , 6.39]. The effect size for the analysis was found to exceed Cohen's 1988 convention for large effect size (80).

Table shows the difference between traumatic and non traumatic on subscale motor perception on neuropsychological impairment scale problem. The result shows significant difference between traumatic and non traumatic. Traumatic (M=10.07 , SD=21.3) Scored lowered than non traumatic (M=6.50, SD=2.74), t(198)=197 with mean difference p<.000, d;0.24, Cl 95% [2.88, 4.24]. The effect size for the analysis was found to exceed Cohen's 1988 convention for large effect size (80).

Table 3 shows the difference between traumatic and non traumatic on subscale depression on neuropsychological impairment scale. The result shows significant difference between traumatic and non traumatic. Traumatic (M=28.74 , SD=5.4) Scored lowered than non traumatic (M=18.17, SD=7.67), t(198)=197 with mean difference p<.000, d;1.59, Cl 95% [8.71 ,12.42]. The effect size for the analysis was found to exceed Cohen's 1988 convention for large effect size (80).

Table 1: Mean difference, Standard Deviation, t-value of Traumatic Patients and non- Patients on Attention. (n=200)

	Traumatic Patient		Non Traumatic Patient					
	M	SD	M	SD	t(198)	p	CI95% LL UL	Cohen's d
NIS	114.2	17.78	72.42	26.63	197	<.000	35.45,48.10	1.84

Table 2: Mean difference, Standard Deviation, t-value of Traumatic Patients and non- Patients on Attention. (n=200)

	Traumatic Patients		Non- Traumatic Patients					
	M	SD	M	SD	t(198)	p	CI95% LL UL	Cohen's d
ATT	67.43	3.82	61.0	26.63	198	<.000	4.89,7.96	0.33

Table 3: Mean difference, Standard Deviation, t-value of Traumatic Patients and non- Patients on Attention. (n=200)

	Traumatic Patients		Non- Traumatic Patients						
	M	SD	M	SD	t(198)	p	CI95% LL	UL	Cohen's d
LP	12.4	1.589	7.74	3.00	198	<.000	3.99	6.33	0.33
SMP	11.25	2.00	7.6	3.37	198	<.000	2.79	4.34	1.31
CP	16.34	2.52	10.84	3.76	198	<.000	4.60	6.39	1.32
MPC	10.07	21.3	6.50	2.74	198	<.000	2.88	4.25	0.24
SSD	28.74	5.4	18.17	7.67	198	<.000	8.71	12.42	1.59

DISCUSSION

The present study was conducted to investigate the attention and neuropsychological deficits among survivors of trauma. The following results prove the hypothesis that there will be significant difference of attention and neuropsychological deficits among traumatic and non-traumatic patient who is also shown from the previous researches that is: There may is a positive relationship in trauma and neuropsychological functioning **(Yehuda *et al*., 2006)**. Trauma has been shown to significantly compromise cognitive development **(Levine, 2007; Perry & Szalavitz, 2006; Trickett, McBride, and Chang, 1995)**. Trauma can effect on individuals learning, sensory motor perceptions, depression, attention, memory and has become increasingly available and consistent in its descriptions of the cognitive and behavioral alterations following exposure to trauma. Trauma can alter the way we view ourselves, the world around us, and alter how we process information and the way we behave and respond to our environment. Without intervention these cognitive processes and behavioral responses can lead to learning deficiencies, performance problems, and problematic behavior **(William Steele, 2008)**.

Listening, attending, acknowledging, summarizing, reflecting, normalizing, nurturing, correcting false information, planning for the remainder of the day, the evening, empathetic responses are the primary crisis responses at this time. This type of special attention, for those having a difficult time emotionally, often is all that is needed. Chronic traumatized individuals has been associated with cognitive impairments involving memory and attention. The association between cognitive impairment and early symptoms of trauma is unknown, yet such association may lead to poorer processing of traumatic memories. This study evaluated the relationship between traumatic symptoms and cognitive functioning within 10 days of traumatic events. Forty-eight survivors were assessed for symptoms of trauma, anxiety, depression and dissociation and for immediate and delayed verbal and

figural memory, attention, learning and IQ. Survivors with high levels of traumatic symptoms showed impaired attention and immediate recall for figural information and lower IQ. They did not show, however, an impairment of verbal recall and learning. The observed difference was not explained by anxiety or dissociation. It disappeared, however, when the effect of depressive symptoms was controlled for. Lower IQ and impaired attention are associated with early PTSD- and depressive symptoms. Poorer attention may have a role in traumatic memories. **(Dalia Brandes, Gershon Ben-Schachar, Assaf Gilboa, Omer Bonne, Sara Freedman, Arieh Y. Shalev, 2002)**. The left-brain function refers to understanding or processing information. One of these functional alterations takes place in the neocortex **Perry & Szalavitz (2006). Bremmer (2001)** have found that while when an individual suffered from trauma so it becomes difficult to process information because of the altered functioning of the neocortex **(Geuze *et al*., 2008; Shin *et al*., 2004; Woodward *et al*., 2006)**. There is a significant relationship between memory performance and hippocampal volumes in the Woodward study may reflect varying temporal relationships between trauma, the hippocampus, and neuropsychological functioning.

CONCLUSION

The aim of this study was to investigate the attention problem and neuropsychological deficits among traumatic and non traumatic individuals. From the findings of this study it is concluded that the traumatic patients are more prone to develop neuropsychological deficits which include learning problem, sensory motor perception, depression, cognitive problems. It is also assumed that those individuals who have suffered from some trauma they have attention problem.

Limitation and Suggestions

The present research is confronted with some limitations. Certain factors were assumed and acknowledged as limitations of the present study and therefore essential to mention for consideration of future research.

- Present study was conducted only on the patients of Lady reading hospital trauma center. The future research should be conducted on patients of all trauma centers of Khyber Pakhtunkwa.
- The sample size was small so the next researcher should collect data from large sample size for confident generalization of results.

- The use of random sample should be noted as a limitation in that results are not generalizble to a large population.

Implication of the study

The findings of the study have very sound implications in practical fields of life as well as in theoretical fields of life of psychology. These results can fill the theoretical jumps present in the previous literature present on this variable and explored the missing links of that variable. So these findings can provide help for the complete understanding of these factors.

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