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Comparative Study of Déjà-Vu and Associated Attributes Among Epileptics and Non-Epileptics

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ABSTRACT

Introduction: Déjà vu is a feeling of familiarity experienced when one undergoes certain events when in reality it is unknown. Déjà vu in epilepsy has shown to occur frequently, last somewhat longer and associated with fatigue, hyperactivity, exhaustion, headaches, blackouts or fear.
Aims & Objectives: To determine any difference in déjà vu and its parameters among epileptic and normal healthy individuals.
Place and duration of study: The study was conducted at Central Park Medical College Lahore, Pakistan December 2019 to March 2020.
Material & Methods: A cross-sectional study was conducted to determine the frequency of the phenomenon of déjà vu between epileptics and non-epileptics. The assessment was done by IDEA questionnaires comprising of 23 items assessing quantitative and qualitative aspects of déjà vu with some additional demographic questions such as age, gender, parental consanguinity, drugs, cause of epilepsy, and fitness status. Data was analyzed using SPSS version 23, p value <0.05 was considered significant.
Results: The group difference was present about perceiving of the feeling of recognition between epileptics (2.00 $\pm$ 2) and non-epileptics (2.00 $\pm$ 3) with a p-value of 0.037. No significant difference was observed on any other parameter.
Conclusion: The study shows no difference in the prevalence of déjà vu and its associated parameters among both groups. The results have limitations due to sample size, time and resources.

Key words: Epilepsy, Déjà vu, Neurologist, Psychiatrist, Memory

INTRODUCTION

Déjà vu is a feeling of familiarity experienced when one undergoes certain events when in reality it is unknown.[1] Recollection involves the exact nature of the recalled experience and a variety of neuro-cognitive processing depending on the situation in which it is produced.[2] People encounter this phenomenon Déjà vu describe the event as though the present moment has happened already or maybe they had already been a part of such a situation with or without voices. But the fact behind it is that there is an illusion of recognition.[3] Olfactory cortex and auditory cortex is also active during recollection alongside the flashbacks which include both visual and auditory illusions and hallucinations.[4,5]
Throughout the world 60%-80% of people experience the feeling of recognition at least once in their lifetime.[6,8] The cause of the Déjà vu is unknown but it occurs due to our unconscious memory being ahead of our conscious memory and this lack of coordination even as brief as a few milliseconds yield this effect.[9,10] It has been proved that it is related to the involvement of brain structures that have a role in memory such as the amygdala, the hippocampus, parahippocampal gyrus, perirhinal cortex, entorhinal cortices, temporal and the prefrontal cortex.[11,13] Déjà vu might be a result of the manifestation of neural imbalance which may be narrated as physiological as there are no harmful effects observed on the body.[14] Surprisingly, Déjà vu is also reported in the form of activity in some medial temporal regions which may accompany seizure activity.[6]
Déjà vu is thought to be an indication of many psychiatric disorders[15] e.g. schizophrenia etc. The neurological disorder epilepsy is a set of abnormalities of the central nervous system in which activity of the brain is affected causing seizures, amnesia, mood swings, anxiety, and fatigue. The patients are more prone to fatigue, delusions, and mental health issues.[13] Hallucinations, delusions and illusions are symptoms of localized or network-based neuronal spike.[16] Déjà vu in epilepsy has been shown to occur frequently which last longer, associated with prior fatigue, hyperactivity, exhaustion, headaches, blackouts and fear than physiological déjà vu.[14] A widely cited cause of Déjà vu experiences is an

epileptic seizure. That is therefore termed as psychic symptoms associated with complex partial seizures[17] in previous literature and to assess the frequency of this phenomenon and its consequences and comparison between epileptic and non-epileptic, a cross-sectional study is conducted in local populous.

MATERIAL AND METHODS

The study was conducted at Central Park Medical College Lahore, Pakistan in collaboration with the University of Hafr Al Batin, Kingdom of Saudi Arabia from December 2019 to March 2020. Informed written consents were obtained in advance from all the volunteers (both epileptics and non-epileptics) and ethical approval (CPMC/IRB-Number-1743) was obtained from the Institutional Review Board of Central Park Medical College, Lahore via formal request (CPMC/ME/2020-1066). A total of 133 volunteers participated in this research work who were divided into two groups; Group 1 epileptics (n=64) and Group 2 non-epileptics (n=69) based on pre diagnosed epilepsy whose age was between 15 years to 40 years. Epileptics whose epilepsy was due to neurosurgery or spinal injuries were excluded from the study. The questionnaires were employed in the English language as all the participants were well versed in English and the questionnaires were filled in the presence of a medical researcher to avoid any ambiguity. The questionnaire consisted of two sections; Section 1 of demographic and basic information about type and nature of epilepsy along with the basic information such as age, gender, parental consanguinity, drugs use and abuse, cause of their epilepsy, and fitness status, while Section 2 was comprised of Inventory Déjà Vu Experiences Assessment (IDEA)[14] to evaluate Déjà vu.

For the assessment of Déjà vu (DV) Inventory Déjà Vu Experiences Assessment (IDEA)[9] was employed to evaluate DV both qualitatively and quantitatively. IDEA is 23 items questionnaire which is sub-grouped into two sections: Section 1 comprised of 9 questions to quantify and assess the prevalence of Déjà vu while Section 2 comprised of 14 questions to evaluate the qualitative nature of Déjà vu. IDEA involves the study and evaluation of psychological experiences i.e., DV, serialization, paranormal quality, remembering dreams, travel frequency, daydreams. According to the IDEA, if subjects mark "Don't know," it will be considered as "never" with the frequency of zero and they would not continue to Section 2. On the whole, it assesses all the para and supranormal phenomena that may or may not lead to Déjà vu and all those 23 parameters of IDEA were based and assessed Likert scale ranging 0 to 10.

Statistical analysis:

Data was entered in SPSS ver. 23 (USA Chicago) and was assessed for errors and omissions. Descriptive and demographic data were presented in frequencies and percentages and were also presented in charts and graphs where data was described with Median $\pm$ IQR. Mean Whitney U test was employed to assess the group differences for the frequency and severity of Déjà vu between Group 1 and Group 2. Spearman correlation was employed to assess correlation for Déjà vu prevalence and associated factors. A p-value $<.05$ was considered significant.

RESULTS

A total of 133 participants participated in the study who were segregated into two groups; Group 1 epileptics (n= 64) and Group 2 non-epileptics (n=69) with the overall mean age of 23.00 ± 5.98 with the age range of 15 to 40 years. In Group 1 the mean age was 25.86 ± 6.305 and in Group 2 the mean age was 19.95 ± 2.368 years. Among epileptics cause of epilepsy was assessed and depicted in Fig-1. Out of 64 epileptic patients, 16 have congenital epilepsy while 28 acquired it later in the life and among 8 patients the cause was idiopathic and rest of the 12 patients had other causes and reasons of onset of epilepsy. In Group 1 (epileptics), there were 26 male and 38 females while in group 2 (non-epileptics) there was 40 males and 29 females. On application of Spearman correlation, a positive correlation of female gender and epilepsy was observed with an R-value of 0.173 and p-value of 0.046 suggesting a higher prevalence of epilepsy in females than males. A significant mean difference was observed for the family history of epilepsy between Groups 1 and 2 with a mean difference of -1.02 with a p-value of .001 suggestive of family history may contribute to the onset of epilepsy.

On application of Mann Whitney U test between epileptics (Group 1) and non-epileptics (Group 2) no significant difference was observed on major parameters of Déjà vu as explained in Table-1. Only difference was observed with the question about traveling between group 1 (2.00 ± 1) and group 2 (3.00 ± 1) with a z value of -.584 and p-value of .006 indicating epileptics usually travel more that lead to contributing factor in the onset of Déjà vu among epileptics. Group difference was also noticed regarding perception of feeling of recognition between Group 1 (2.00 ± 2) and Group 2 (2.00 ± 3)

with a z value of -2.082 and p-value of .037 and besides these no significant difference was observed.

Déjà Vu Parameters	Median ± IQR		P-value
	Group 1 (Epileptics)	Group 2 (Non-Epileptics)	
Have you ever felt that having experienced sensation in same way or experienced the same thing before?	3.00 ± 1	3.00 ± 1	.901
Have you ever felt that everything in your life seemed to be going unreal?	3.00 ± 1	2.00 ± 2	.440
Have you ever felt like you had never met anything before and in fact you had experienced it before?	2.00 ± 2	2.00 ± 2	.707
Has it once happened to you that you had experienced something that had happened before in a dream?	3.00 ± 4	3.00 ± 2	.945
Have you ever felt that something didn't happen to you but to someone you are watching at?	2.00 ± 3	2.00 ± 2	.850
Do you experiment any paranormal activities?	2.00 ± 2	2.00 ± 2	.643
How often do you remember a dream that you would tell someone about?	3.00 ± 2	4.00 ± 2	.237
How many times a year do you travel from your neighborhood?	2.00 ± 1	3.00 ± 1	.006*
Has it ever happened to you that you were daydreaming?	4.00 ± 3	3.00 ± 3	.547
Have you ever had this feeling of "recognition"?	11.00 ± 11	11.00 ± 0	.368
Have you ever experienced feeling of recognition in same way before?	2.00 ± 1	2.00 ± 3	.554
When did you experience it last time?	5.00 ± 3	4.00 ± 3	.212
What is the duration of this feeling of "recognition"?	3.00 ± 5	3.00 ± 1	.093
Sensation of recognition is associated with particular experience, things or events?	3.00 ± 1	3.00 ± 1	.173
Have you ever had the feeling of being "recognized" at a certain time of the day?	1.00 ± 2	1.00 ± 3	.790
Can you predict what's going next when you experience this phenomenon?	2.00 ± 2	2.00 ± 3	.037*
When you were experiencing this, have you felt that you are watching yourself?	2.00 ± 3	2.00 ± 3	.247
When you perceive similarity of a current event to a known event, how much similar is it?	3.50 ± 3	3.00 ± 3	.781
Do you feel it's unreal when you experience the sense of 'recognition'?	2.00 ± 2	2.00 ± 3	.734
In general, how does this feeling of "recognition" affect you?	5.00 ± 7	6.00 ± 7	.320
What do you think is the meaning of these "known" feelings?	5.00 ± 5	4.00 ± 4	.531
What you feel before having this feeling of being "known"?	6.00 ± 9	6.00 ± 4	.625
Have you experience the sense of being 'known' in these situations?	3.00 ± 2	4.00 ± 3	.696

Table-1: Indicating Group Differences in Déjà Vu on the appliance of Mann Whitney U test.

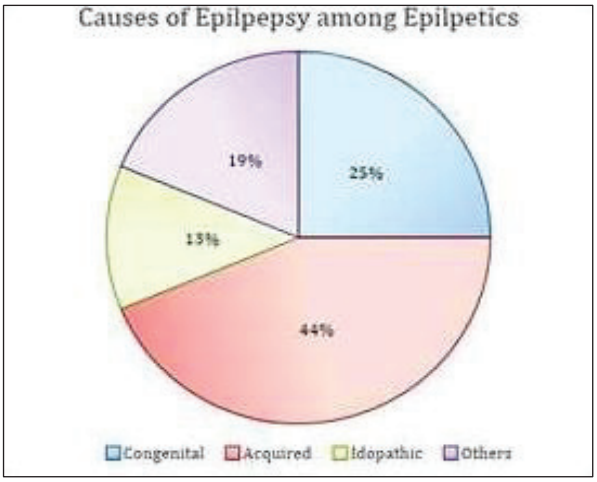

Fig-1: Elaborating the causes of Epilepsy among Epileptic Volunteers.

DISCUSSION

Analysis of research literature on the experience of déjà vu showed that the only difference between the epileptic and non-epileptic groups was the frequency of experiencing déjà vu. Our analysis showed no significant difference between the prevalence of déjà vu among them, which shows a contradiction with previous literature. According to Adachi et al.[7] the frequency in epileptic patients was relatively low whereas Warren et al.[14] explain that the difference is only because of the frequency of déjà vu in both the groups.

By the Qualitative analysis, we found out the parameter showing the association of Déjà vu with traveling is significantly high in Epileptic than in the control group, that is similar to recent Labate et al.[6] study which also concluded the frequency of travelling was mostly correlated to DV in Epilepsy suggesting that the network comprise of visual-memory may be involved in epileptic DV.[18] Hence Pakistan is a developing country, people have to travel from rural to urban areas for the proper medications and availability of necessities of life so if epileptic patients have to travel a lot for their medical needs,[19] they will surely experience the déjà vu more frequently.

Quantitative analysis of people experiencing déjà vu are mostly females but most of the recent studies contradicts this and stated that Déjà vu is not a gender-based problem rather it depends on age.[20] So, due to lack of any previous authentication we deduced from our research that most females experience déjà vu due to their emotionally imaginative and empathic nature or might be it is due to the ethnic differences among the population of our studies with recent studies,[21] whereas we cannot be sure if it is a gender-based problem due to the less

male patients in our research. So this will remain an open question that Deja vu is a gender based phenomenon or not.

Despite the facts about the frequency of déjà vu we also found out the ratio of different causes leading to epilepsy (Fig-1) in which head and spinal injuries with trauma were highest ratio parameters causing epilepsy in patients in Pakistan which might be due to the worse conditions of emergency and intensive care units in the country.[22] Another major cause of epilepsy in Pakistan is congenital due to genetic predisposition in the family history which is likely to happen due to the high rate of consanguineous marriages in Pakistan which is around 70% of total population.[23] Another reason for epilepsy is the patient's lack of awareness and education about mental health problems as people do not know about their symptoms and conditions because of their superstitious beliefs and societal reputation.[24]

Our study was limited by the small sample size due to restrictions of COVID19, thus, these results may not be generalized to the whole population. Apart from the pandemic, we could also not expand our study due to problems related to lack of resources and logistics.

CONCLUSION

The frequency of déjà vu among both epileptic and non-epileptic is the same. Déjà vu is mostly experienced by females and people who travel a lot.

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