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MELATONIN'S EFFECT IN EPILEPSY AND FEBRILE SEIZURES

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Abstract:
Objective: *It is necessary to identify risk aspects for epilepsy and febrile seizures (FS). Studies on the role of melatonin in these seizure syndromes are partial. This study determines the relationship among FS, serum melatonin levels and epilepsy in children.*
Place and Duration: *In the Pediatric Unit II of Services Hospital Lahore for one-year duration from March 2019 to February 2020.*
Material and Method: *A group of 111 children (37 children per group respectively) with simple FS, complex FS and epilepsy was considered as a group of cases. In addition, 37 children with non-seizure fever were the control group. Serum melatonin levels were measured and compared among all groups.*
Results: *Serum melatonin levels in simple, epilepsy groups and complex FS were 2, 2.4 and 2 pg. The serum melatonin level in the control / ml group was 2.1 pg. In addition, no significant difference was seen when comparing case groups.*
Conclusion: *This study shows that there is no relationship among serum melatonin levels and simple or complex epilepsy and FS. Melatonin does not play a role in seizure disorders.*
Keywords: *epilepsy, Simple febrile seizures, Complex febrile seizures, melatonin*

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INTRODUCTION:

Febrile seizures and epilepsy are the utmost communal causes of seizures in children. The incidence of FS is 2-9%. As defined by the National Institutes of Health (NIH) in 1980, the I International League of Epilepsy (ILAE) in 1993. FS means seizure at body temperature (usually above 38 ° C). In addition, these patients do not have a central infection or electrolyte imbalance[1-2]. Epilepsy is thought to occur when two or more unprovoked seizures occur within 24 hours. The lifetime incidence of epilepsy is 3%, and more than half of the cases begin in childhood. Children with epilepsy do not have a fever or a central nervous system infection[3]. Despite the many studies, the true causes of these seizure disorders are unknown. Interestingly, Guo and Yao described that serum melatonin levels were significantly reduced in children with complex FS and epilepsy[4-5]. Melatonin is a hormone derived from tryptophan, which is mainly secreted by the pineal gland. This study explores the relationship among serum melatonin levels and simple or complex FS and epilepsy in children[6].

MATERIALS & METHODS:

This controlled case study was conducted at the Pediatric Unit II of Services Hospital Lahore for one-year duration from March 2019 to February 2020. Children with combined seizures after FS were selected (111 patients in total) and combined seizures (37 patients per group, respectively). The control group consisted of 37 feverish children without seizures. The age of all patients ranges from 6 months to 5 years. The sample size was calculated as follows:

a = 0.05; 8 = 0.01; µ2 = 23.93 ng / 1 µ 1 = 20.72 ng / 1; δ1 = 2.54; δ2 = 2.01. Inclusion criteria for FS groups are: 1) fever f38 ° C; 2) occurrence of seizures that meet the simple criteria of FS (general seizures lasting less than 15 minutes); and 3) Seizures that meet the complex criteria of FS (focal lengths lasting more than 15 minutes and repeated more than once every 24 hours) Epilepsy was considered present when 2 or more non-provoked seizures occurred. Intervals longer than 24 hours Patients with central nervous system infection (such as meningitis or encephalitis), electrolyte imbalance or neurological deficiency were excluded. The control group was healthy children without seizures who visited the hospital clinic for fever. Children in all groups were selected based on age, gender, height, weight, severity of fever and head circumference. Height, weight, body temperature and head circumference (all patients measured by standard methods. All parents received information about the test method and accepted the consent form, and after signing he was included in the study, 6 ml of blood was collected from peripheral vessels and centrifuged in all groups, the serum was poured into an acid-washed tube and stored at a controlled temperature (-20 ° C) in a refrigerator. All melatonin samples were taken 24 hours after the clinical crisis. During blood sampling, all conditions, such as posture and ambient lighting, were the same for all groups (15). Serum melatonin was measured by enzyme immunoassay (ELISA) (IBL International, Hamburg, Germany and lot number EME151). All samples were measured twice to increase precision. Analysis of variance (ANOVA) was used to relate the variables amongst case and control for statistical analysis; The Mann-Whitney test was used to compare serum melatonin levels. The SPSS 11.5 version was used for data examination. A p-value <0.05 was considered statistically substantial.

RESULTS:

A simple FS group consisted of 19 men and 18 women. Complex FS groups and epilepsy consisted of 15 men, 22 women and 21 men and 16 women, respectively. In the control group, 21 were female and 16 patients were male (p = 0.43). The least and extreme age in the study and control group was 6 and 60 months, respectively. There was no statistically substantial difference among groups in age, body weight, height, head circumference and body temperature (p> 0.05; Table 1).

Table 1. Comparison of Variables in Case and Control Groups

riables	Case groups			Control group	P- Value
	Simple FS (Mean ±SD)	Complex FS (Mean ±SD)	Epilepsy (Mean ±SD)	(Mean ±SD)	
Age(month)	23.75 ±14.59	31.41±1602	28.21 ± 15.17	24.20±14.46	0.1
Weight(kg)	12.57±2.46	13.22±2.26	13.40±2.40	12.14±2.14	0.09
Height(cm)	84.63±10.05	89.58 ±11.34	87.91±11.35	84.44±10.78	0.07
Head circumference(cm)	47.68± 1.93	48.54±2.07	48.22±1.97	47.66 ±1.83	0.1
Temperature ˚C	38.40± 0.36	38.42± 0.42		38.25± 0.39	0.1

Serum melatonin levels were 2, 2.4 and 2 pg/ ml in FS and simple and complex epilepsy groups. The serum melatonin level in the control group was 2.1 pg. / ml Serum melatonin levels did not differ suggestively among patients with simple FS (p = 0.433), combined FS (p = 0.485) and epilepsy (p = 0.192). In addition, no substantial difference was observed when comparing case groups (p> 0.05; Table 2, Fig. 1).

Table 2. Comparison of Serum Melatonin between Groups

Groups Serum melatonin (median pg/ml)	Groups Serum melatonin (median pg/ml)	P-Values
Control (2.1)	Simple FS (2)	0.43
	Complex FS (2.4)	0.48
	Epilepsy (2)	0.19
Simple FS (2)	Complex FS (2.4)	0.92
	Epilepsy (2)	0.4
Complex FS (2.4)	Epilepsy (2)	0.24

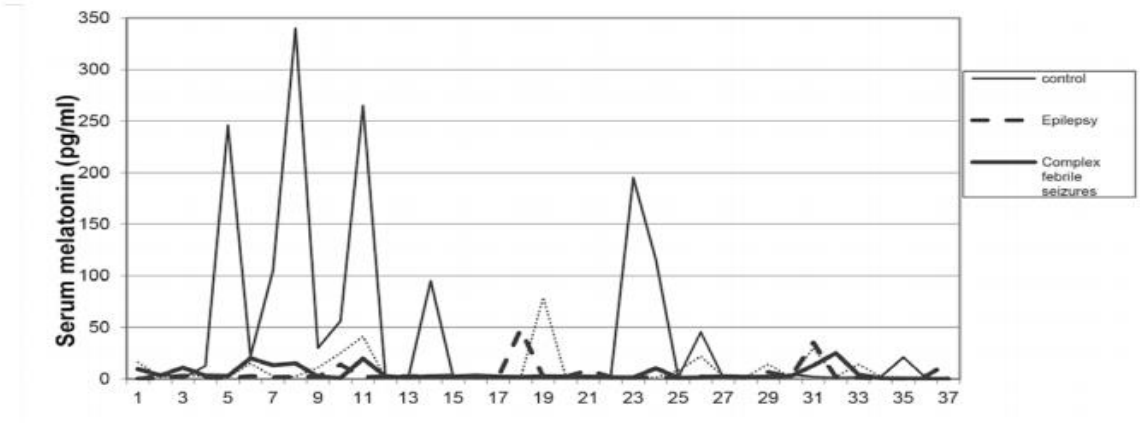

Fig 1. Comparison of serum melatonin level in case and control groups

DISCUSSION:

Although several studies on the role of many risk factors for FS and epilepsy have been described, the true causes of these seizure disorders are unknown. Based on the role of some antioxidants in FS, this study determines whether other melatonin antioxidants are mixed with FS and fever attacks[7]. When it comes to searching for information and literature, research in this area is limited. Melatonin ((N-acetyl-5-methoxytryptamine) was first removed from the pineal gland by Aaron Lerner in 1958. Melatonin is the main hormone secreted by tryptophan and serotonin[8]. Antioxidant effects include the removal of reactive oxygen samples such as hydroxyl radicals and oxide Nitric oxide synthase. The role of n is to protect or protect the health of the central nervous system, but the concept of anticonvulsant amounts of mel pro Atonine is controversial Guo et al[9]. epile reported that serum melatonin levels have decreased in children with psi or FS complex. Suggest that administration exogenous melatonin may be useful in the treatment of epilepsy and FS in children. Bazil et al[10]. In patients with persistent temporal epilepsy, it was found that salivary melatonin increased 3-fold in patients with epilepsy initially after convulsive seizures compared to the control group. This showed that melatonin has anticonvulsant properties[11]. Another study showed that patients with the night combination of Al epilepsy and daytime epilepsy had lower levels of melatonin than the control group. Molina-Carballo et al. In 54 children with seizures (febrile and epileptic), serum melatonin levels increased during seizures and returned to normal after 1 hour. They concluded that promoting melatonin production through attacks could represent the body's response to attacks and try homeostasis. Similar results were found in a previous study. However, Schapel et al[12]. In 30 patients with untreated active epilepsy and 19 healthy controls, the excretion rate of oxymelatonin 6-sulfate (a metabolite of melatonin in the liver) was higher in healthy patients than in healthy controls. They concluded that melatonin production increased in untreated patients with active epilepsy and was a circadian model with phase differences associated with controls. On the contrary, Rao et al[13]. Serum melatonin levels were found not to change during and after the seizures and were within normal limits for healthy populations. In addition, a separate study showed that there was no significant difference in salivary melatonin levels between FS and epilepsy patients compared to the control group. They also concluded that the anticonvulsant effect of melatonin on epilepsy and FS was not significant. However, Fauteck has shown that a single 5-10 mg dose of melatonin per night can reduce seizures in children. This study also suggests that melatonin may be a useful anti-epileptic drug. The anti-epileptic effect of melatonin has been confirmed by

Peled, who said that the anticonvulsant properties of melatonin depend on antioxidant activity, increased levels of gamma-aminobutyric acid (GABA) in the brain, and inhibition of brain entry[14]. Reduction of calcium and neuronal nitric oxide production in neurons. On the contrary, another study has shown that the anticonvulsant effect of melatonin is negligible and can sometimes intensify seizures. In this study, no correlation was found between serum melatonin levels and simple or complex FS and epilepsy[15]. Melatonin does not appear to play a role in these seizure disorders.

CONCLUSION:

This study shows that there is no relationship among serum melatonin levels and simple or complex epilepsy and FS. Melatonin does not play a role in seizure disorders.

REFERENCES:

1. Barghout, Mohammad Sami, Azza Kamal Al-Shahawy, Doaa Mohamed El Amrousy, and Amira Hamed Darwish. "Comparison Between Efficacy of Melatonin and Diazepam for Prevention of Recurrent Simple Febrile Seizures: A Randomized Clinical Trial." *Pediatric neurology* 101 (2019): 33-38.
2. Mogulkoc, Rasim, Abdülkerim Kasim Baltaci, and Leyla Aydin. "Role of Melatonin Receptors in Hyperthermia-Induced Acute Seizure Model of Rats." *Journal of Molecular Neuroscience* 69, no. 4 (2019): 636-642.
3. Mohammadi, Fatemeh, Saeed Shakiba, Saeed Mehrzadi, Khashayar Afshari, Amir Hossein Rahimnia, and Ahmad Reza Dehpour. "Anticonvulsant effect of melatonin through ATP-sensitive channels in mice." *Fundamental & Clinical Pharmacology* 34, no. 1 (2020): 148-155.
4. Matta, Gopi Srikanth, and Ravi Prakash Peddisetty. "Impact of etiology on efficacy of oral triclofos in recording pediatric electroencephalography: A tertiary care center study." *Journal of neurosciences in rural practice* 10, no. 02 (2019): 234-237.
5. Besag, Frank MC, Michael J. Vasey, Kim SJ Lao, and Ian CK Wong. "Adverse Events Associated with Melatonin for the Treatment of Primary or Secondary Sleep Disorders: A Systematic Review." *CNS drugs* (2019): 1-20.
6. Kim, Sung Hoon, Haeng Seon Shim, Su Mynn Kang, Hyunho Park, Mi Hyeon Jin, and Jun Hwa Lee. "Are there effects of lunar cycle on pediatric febrile seizure?: A single-center retrospective study (2005–2018)." *Science of The Total Environment* 692 (2019): 589-594.
7. Gitai, Daniel Leite Góes, Tiago Gomes de Andrade, Ygor Daniel Ramos dos Santos, Sahithi Attaluri, and Ashok K. Shetty. "Chronobiology of limbic seizures: Potential mechanisms and prospects of chronotherapy for mesial temporal lobe epilepsy." *Neuroscience & Biobehavioral Reviews* 98 (2019): 122-134.
8. Schoonjans, An-Sofie, Shauni De Keersmaecker, Maxime Van Bouwel, and Berten Ceulemans. "More daytime sleepiness and worse quality of sleep in patients with Dravet Syndrome compared to other epilepsy patients." *European Journal of Paediatric Neurology* 23, no. 1 (2019): 61-69.
9. Rzepka-Migut, Beata, and Justyna Paprocka. "Melatonin-Measurement Methods and the Factors Modifying the Results. A Systematic Review of the Literature." *International Journal of Environmental Research and Public Health* 17, no. 6 (2020): 1916.
10. Martin, Keith Frank, John David Heal, and Elizabeth Jagger. "Epilepsy treatment employing ketogenic compounds which arrest apoptosis." U.S. Patent Application 16/222,996, filed August 15, 2019.
11. Michelin, Ana Paula, Mchael Maes, Thitiporn Supasitthumrong, Chusak Limotai, Andressa Keiko Matsumoto, Laura de Oliveira Semeão, João Victor de Lima Pedrão, Estefania Gastaldello Moreira, Buranee Kanchanatwan, and Décio Sabbatini Barbosa. "Lowered Paraoxonase 1 Activities May Explain the Comorbidities Between Temporal Lobe Epilepsy or Mesial Temporal Sclerosis and Comorbid Depression, Anxiety and Psychosis." (2020).
12. Eastman, Cliff, Raimondo D'Ambrosio, and Thota Ganesh. "Modulating neuroinflammation and oxidative stress to prevent epilepsy and improve outcomes after traumatic brain injury." *Neuropharmacology* (2019): 107907.
13. Brugman, Jaanri, Regan Shane Solomons, Carl Lombard, Andrew Redfern, and Anne-Marie Du Plessis. "Risk-Stratification of Children Presenting to Ambulatory Paediatrics with First-Onset Seizures: Should We Order an Urgent CT Brain?." *Journal of Tropical Pediatrics* (2019).
14. Ozdemir, A. Faruk, Rahsan Kemerdere, B. Orhan, H. Ozturk Emre, B. Bercik Inal, A. Kayhan, S. Naz Yeni, and T. Tanriverdi. "Serum endocan and preoperative systemic inflammatory markers in patients with epilepsy." *Neurochirurgie* 66, no. 1 (2020): 29-35.
15. Vlaskamp, Danique RM, Benjamin J. Shaw, Rosemary Burgess, Davide Mei, Martino Montomoli, Han Xie, Candace T. Myers et al. "SYNGAP1 encephalopathy: a distinctive generalized developmental and epileptic encephalopathy." *Neurology* 92, no. 2 (2019): e96-e107.