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EVALUATION OF CLINICAL PARAMETERS OF EPILEPSY IN PUNJAB PAKISTAN

HINA MAHREEN
Department of Zoology, The Women University Kutchery Campus, L.M.Q Road, Multan.

SUMAIRA KANWAL
Department of Biosciences Comsat University, Comsats Road off GT Road, Sahiwal.

TASLEEM KAUSER
Department of Zoology, GOVT Sadiq Women University Bahawalpur.

SHAZIA PERVEEN*
Department of Zoology, The Women University Kutchery Campus, L.M.Q Road, Multan.
*Corresponding Author Email ID: drshazia.zool@Wum.edu.pk

Abstract:

Epilepsy is the most common cause of neurological disorder due to disturbance in brain activity. Both genetic and environmental factors play a significant role in development of epilepsy. **Objective:** The present study was designed to find out prevalence of epilepsy in Pakistani population, frequencies of different parameters involved in epilepsy and association of these factors with different types of epilepsy. **Method:** Patients with epilepsy were selected from different hospitals of Punjab Pakistan. Questionnaire based data was collected and was entered in SPSS software. Study was conducted in department of zoology the women university Multan. **Result:** Different parameters showed variable frequencies. Each patient has different onset age. Tonic colonic seizure is most common in all patients. There is no significant difference was found in correlation test. Degree of freedom value for correlation between seizure type and consanguineous parents was 11 and chi square test value was .253. Degree of freedom value was 33 and chi square test value was.850 in the correlation between seizure type and onset age. Different mean value was found in sample collection age, onset age and diagnosis age that are 25.73, 12.56 and 13.22 respectively. **Conclusion:** Frequency data of gender, onset age, seizure frequency and seizer types are in accordance of the literature and no correlation between different parameters was observed in our data.

Keywords: Antiepileptic drugs, Epilepsy, Environmental factors, Neurological disorder, Tonic colonic seizure

INTRODUCTION:

Nervous disorders are more familiar regarding 6.3 % of total disease burden in the world.[1] Epilepsy is brain abnormality that shows recurrent seizure. It undergoes to generate abnormal activity lead to loss of consciousness called epileptic seizure.[2] Seizures caused due to abnormal activity of neurons and disturb the balance between the neuronal excitation and inhibition. This activity initiated due to disturbance of electrical communication between neurons.[3] Classification of seizure based on onset mode, awareness level and initial symptoms.[4] It is characterize by recurrent seizure those results

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due to excessive discharge of cortical neurons. It is divided into focal and generalized epilepsy.[5] Its prevalence is 7.6/1000 individuals and 50 to 65 million individuals affected in the whole world. Epilepsy frequency is age dependent. Its incidence rate is higher under 5 years and above 65 years of age.[6] Prevalence of epilepsy in Pakistan is about 9.99/1000. Its rate is higher in young. Epilepsy prevalence rate double in rural areas as compared to urban areas.[7] Multiple causes involve in epilepsy. 70 % to 80 % epilepsy cause due to genetic factors that is the main factor of idiopathic epilepsies.[8] Genetic epilepsies are comprised to heterogeneous group of disorders. It cause due to genes mutation, chromosomal abnormalities and ion channel gene mutations.[9] Epilepsy cause due to many reasons such as head injury, tumors and genetics.[10] The present study was designed to evaluate the different parameters frequencies which involved in epilepsy.

MATERIAL AND METHOD

Study site and Ethics approval:

Present study was conducted in department of Zoology, The Women University Multan Pakistan. It was approved from the Board of Advanced Studies and Research and ethical comity of The Women University Multan, Pakistan (WUM/UREC/20-00015).

Selection of patients:

Medical record of patients was collected from 1st December 2018 to 31st August 2020 from DHQ hospital Vehari and THQ hospital Mailsi of Punjab, Pakistan. Epilepsy patients were recruited on the basis of sign and symptoms. Age of epilepsy patients ranged from 5 to 60 years. The data of participants was kept unidentified without name and other information. Epilepsy patients diagnostic criteria were made according to the classification of international league against epilepsy.[11] A question based Performa was created to obtained the clinical data of epilepsy patients such as age, seizure type, use of drugs against epilepsy, disease onset age, patient's family history and seizure frequency were also analyzed and confirmed by the patients for this study. All age group patients who showed symptoms of epilepsy and seizure were included in this study. Patients that showed other symptoms such as autistic behavior, intellectual disability, and illness related to psychiatry, ischemic injury, central nervous system infection and other brain injuries were excluded from the study.

Statistical analysis:

Statistical package for social science for window version 26 (SPSS 26) was used for all the analysis. Data was presented in the form of bar graph. Correlation data was analyzed by chi square test.

RESULTS:

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There were hundred epilepsy patients in this study. Fifty nine male and forty one female was included in this study (Fig. 1A). Non-Consanguineous parents showed higher frequency as compared to consanguineous parents (Fig. 1B). Many other related risk factors were found in epilepsy patients such as dementia, migraine, autism and mental retardation. In present study individuals that have no other disease symptoms showed highest frequency of seventy six while lowest number observed in autism and mental retardation affecting only one individual (Fig. 1C).

Patients used drug for seizure control. In present data some individuals used antiepileptic drugs while others not. Highest frequency was observed in patients that use medicine. Person with epilepsy that used antiepileptic drug showed highest frequency of seventy six individuals as compared to those that do not used any antiepileptic drug (Fig. 1D).

Four age brackets formed according to sample collection age such as age group one extend from one to twenty years of age, second from twenty one to forty year of age, third from forty one to sixty years and fourth group from sixty one to eight years of age. Frequency of individual was different in all age groups. Forty-six individuals showed highest frequency in age group second (21-40) while only one individual showed lowest frequency in age group fourth (61-80) (Fig. 2A). According to diagnosis age of disease four age set established that extend from one to forty year of age. Age group one extend from one to ten year, second from eleven to twenty, third from twenty one to thirty and fourth age group extend from thirty one to forty years of age. Fifty one Individuals from eleven to twenty years of age showed highest prevalence while four individuals found lowest prevalence from thirty one to forty years of age (Fig. 2B).

According to seizure onset age four age brackets formed that run from one to forty years of age. Age group one that extend from one to ten year of age, second from eleven to twenty year, third from twenty one to thirty years and fourth age group extend from thirty one to forty year of age. In age group second (11-20) forty eight individuals showed highest frequency while three individuals found in age group fourth (31-40) showed lowest frequency in the data (Fig. 2C). Person with epilepsy faced different seizure types such as tonic, colonic, tonic colonic, simple febrile, myoclonic, partial, generalized absence, complex partial, simple partial, unidentified, status epileptics and atonic seizure. All seizure types showed different frequency. Highest prevalence was found in tonic colonic seizure of twenty two in the data while lowest prevalence was observed in status epileptics, Myoclonic and Complex partial seizure which was two (Fig. 2D).

Correlation between seizure type and onset age:

In accordance to onset age of seizure four age sets were formed such as 1-10, 11-20, 21-30 and 31-40. Tonic colonic seizure frequency was higher in age set 1-10 and 11-20. There was no remarkable variability was analyzed in type of seizure in age set 21-30 and 31-40. Degree of freedom value was 33 and chi square test value was .850 (Fig.3A).

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Correlation between seizure type and consanguineous parents:

Seizure type that was established in consanguineous and non-consanguineous parents showed significant difference. Colonic and tonic colonic seizure frequency was seven and eleven respectively which was in equal ratio in both consanguineous and non-consanguineous parents. Some seizure forms such as complex partial, status epileptics and atonic seizure not found in the patients of consanguineous parents while present in non-consanguineous parents. Partial seizure showed lowest seizure recurrence of one in non-consanguineous parents. Degree of freedom value for this correlation was 11 and chi square test value was .253 (Fig. 3B).

DISCUSSION:

Patients which have consanguineous parents have higher chances of getting epilepsy as compared to non-consanguineous parents. Consanguinity was the major risk factor for the higher incidence of epilepsy. 42.5% patients in the study have consanguineous parents.[12] Consanguinity was a genetic association that led to increase chances of disease. Consanguinity increase the chances of development of epilepsy.[13] In this study frequency of non-consanguineous parents was higher as compared to consanguineous parents. It is due to that reason that random sampling done in my study. There were no criteria about sampling according to family history and consanguinity. In the present study the ratio of consanguineous parents was 43 % as compared to non-consanguineous parents that was 57 %. Prevalence of epilepsy associated with different factors such socioeconomic status of the people and gender.

Epilepsy prevalence rate was elevated in male as compared to females' due to common risk factors. Its incidence rate was higher in youngest population and oldest individuals. In children its rate was higher in first year of life and decline 30-59 years of age. Its rate again increase after 85 years of life.[14] In present study frequency in male was higher as compared to females. Present study strongly associated with above cited literature. Frequency of epilepsy seizure was higher between the ages of 20-29 years. Epilepsy rate was higher in younger and older individuals. According to age epilepsy prevalence rate varied in different areas of the world. It was correlated with other factors which played role in development of epilepsy.[15] Participants in this study showed higher prevalence of disease in age group 22-30 years of age.[16] In present study according to sample collection age of patients the highest frequency was observed in age group 21-40 years while 61-80 years of age showed lowest frequency. 11-20 years of age showed higher seizure onset age while lowest frequency was observed in 31-40 years of age. Epilepsy patients showed higher ratio of psychiatric disorders as compared to general population. Different countries of the world showed different ratio of psychiatric disorders in people with epilepsy. In USA, Canada and Sweden showed prevalence of psychiatric disorders were 41 %, 35 % and 5 % respectively.[17] In epilepsy patients anxiety and depressive

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disorders 4 % to 36 % and 4 % to 30 % while in general population 6.5 % and 2.6 % respectively.[18] Epilepsy patients have higher chances for migraine as compared to healthy population. Children over the age of ten years have more chances for getting migraine.[19] Person with epilepsy along with migraine has severe seizure frequency.[20] In present study thirteen percent epilepsy patients showed migraine. Present data strongly associated with the above cited literature. Person with epilepsy faced dementia and its chances are higher in epilepsy patients than general population. Prevalence of dementia is 5 %.[21] Chances of depression were higher in children which faced epilepsy than general population. Depression chances were five times greater in epileptic children than children without epilepsy. In epileptic children the prevalence of depression was 7 % to 19 %. Seizure frequency and its types affects depression in children.[22] Prevalence of dementia is 9 % and tonic colonic was dominant seizure type.[23] Generalized tonic colonic seizure showed highest frequency 59 % while simple partial showed 21 % frequency.[24] In this study higher seizure frequency was observed in generalized tonic colonic seizure which was twenty two. Seizure frequency was different in both genders. Epilepsy prevalence rate is higher in low middle income countries. 75 % individuals in low income countries do not receive any treatment. Treatment gap was lead to higher incidence rate of epilepsy in resource poor country. In Sub Saharan Africa 59 % patients do not receive any treatment while 33 % people receive treatment against epilepsy.[25] In the present study 76 % patients used medicines while 24 % do not use any antiepileptic drug.

CONCLUSION:

Frequency data of gender, onset age, seizure frequency and seizer types are in accordance of the literature and no correlation between different parameters was observed in our data.

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Disclaimer:

Conflict of interest: Authors have no conflict of interest

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REFERENCES

1) Komolafe MA, Owagbemi OF, Alimi TI. The distribution and pattern of neurological disease in a neurology clinic in Ile-Ife, Nigeria. Niger J Clin Pract. 2018;21(11):1520-4.

2) Liu J, Tong L, Song S, Niu Y, Li J, Wu X, et al. Novel and de novo mutations in pediatric refractory epilepsy. Mol Brain. 2018;11(1):018-0392.

3) Ułamek-Kozioł M, Czuczwar SJ, Januszewski S, Pluta R. Ketogenic Diet and Epilepsy. Nutrients. 2019;11(10).

ISSN: 1673-064X
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4) Kim J-E, Cho K-O. Functional Nutrients for Epilepsy. Nutrients. 2019;11(6):1309.

5) Oyrer J, Maljevic S, Scheffer IE, Berkovic SF, Petrou S, Reid CA. Ion Channels in Genetic Epilepsy: From Genes and Mechanisms to Disease-Targeted Therapies. Pharmacological reviews. 2018;70(1):142-73.

6) Symonds JD, Zuberi SM, Stewart K, McLellan A, O'Regan M, MacLeod S, et al. Incidence and phenotypes of childhood-onset genetic epilepsies: a prospective population-based national cohort. Brain. 2019;142(8):2303-18.

7) Sahar NU. Assessment of psychological distress in epilepsy: perspective from pakistan. Epilepsy Res Treat. 2012;171725(10):29.

8) Sahli M, Zrhidri A, Elaloui SC, Smaili W, Lyahyai J, Oudghiri FZ, et al. Clinical exome sequencing identifies two novel mutations of the SCN1A and SCN2A genes in Moroccan patients with epilepsy: a case series. J Med Case Rep. 2019;13(1):019-2203.

9) Pearson-Smith JN, Patel M. Metabolic Dysfunction and Oxidative Stress in Epilepsy. Int J Mol Sci. 2017;18(11).

10) Lindy AS, Stosser MB, Butler E, Downtain-Pickersgill C, Shanmugham A, Retterer K, et al. Diagnostic outcomes for genetic testing of 70 genes in 8565 patients with epilepsy and neurodevelopmental disorders. Epilepsia. 2018;59(5):1062-71.

11) Sapio MR, Vessaz M, Thomas P, Genton P, Fricker LD, Salzmann A. Novel carboxypeptidase A6 (CPA6) mutations identified in patients with juvenile myoclonic and generalized epilepsy. PLoS One. 2015;10(4).

12) Joybell CC, Kumar MK. Close-kin marriage–An injustice to forthcoming generations. Eastern Journal of Medical Sciences. 2020.

13) Alqadi KS, Rammal SA, Alam ME, Alshahrani AM, Baeesa SS, Kayyali HR, et al. Consanguinity in patients with mesial temporal lobe epilepsy due to hippocampal sclerosis in a Saudi population. Neurosciences (Riyadh, Saudi Arabia). 2020;25(4):276-80.

14) Beghi E. The epidemiology of epilepsy. Neuroepidemiology. 2020;54(2):185-91.

15) Beghi E, Giussani G. Aging and the Epidemiology of Epilepsy. Neuroepidemiology. 2018;51(3-4):216-23.

16) Alshamrani FJ, Alshurem MA, Almuaigel MF, AlMohish NM. Epilepsy trigger factors in Saudi Arabia. Saudi Medical Journal. 2020;41(8):828-33.

17) Muhigwa A, Preux P-M, Gérard D, Marin B, Boumediène F, Ntamwira C, et al. Comorbidities of epilepsy in low and middle-income countries: systematic review and meta-analysis. Scientific Reports. 2020;10(1):1-11.

18) Scott AJ, Sharpe L, Loomes M, Gandy M. Systematic review and meta-analysis of anxiety and depression in youth with epilepsy. Journal of pediatric psychology. 2020;45(2):133-44.

19) Kim DW, Lee SK. Headache and Epilepsy. J Epilepsy Res. 2017;7(1):7-15.

20) Huang Y, Xiao H, Qin X, Nong Y, Zou D, Wu Y. The genetic relationship between epilepsy and hemiplegic migraine. Neuropsychiatr Dis Treat. 2017;13:1175-9.

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DOI 10.17605/OSF.IO/X3HM4

21) Subota A, Pham T, Jetté N, Sauro K, Lorenzetti D, Holroyd-Leduc J. The association between dementia and epilepsy: A systematic review and meta-analysis. Epilepsia. 2017;58(6):962-72.

22) Yang C, Hao Z, Mao Y, Xu Q, Zhao L, Zhang L-L. Depression in children with epilepsy from western China: A cross-sectional survey. Medicine. 2020;99(24).

23) Nashabat M, Al Qahtani XS, Almakdob S, Altwaijri W, Ba-Armah DM, Hundallah K, et al. The landscape of early infantile epileptic encephalopathy in a consanguineous population. Seizure. 2019;69:154-72.

24) Singh V. CLINICAL PROFILE OF EPILEPSY IN CHILDREN AT A KM MEDICAL COLLEGE AND HOSPITAL. International Journal of Medical Science And Diagnosis Research. 2019;3(4).

25) Wagner RG, Kabudula CW, Forsgren L, Ibinda F, Lindholm L, Kahn K, et al. Epilepsy care cascade, treatment gap and its determinants in rural South Africa. Seizure. 2020;80:175-80.

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Fig 1: A. Frequency of gender B. Frequency of consanguineous parents C. Frequency of Associated disorders D. Frequency of Medical refractory

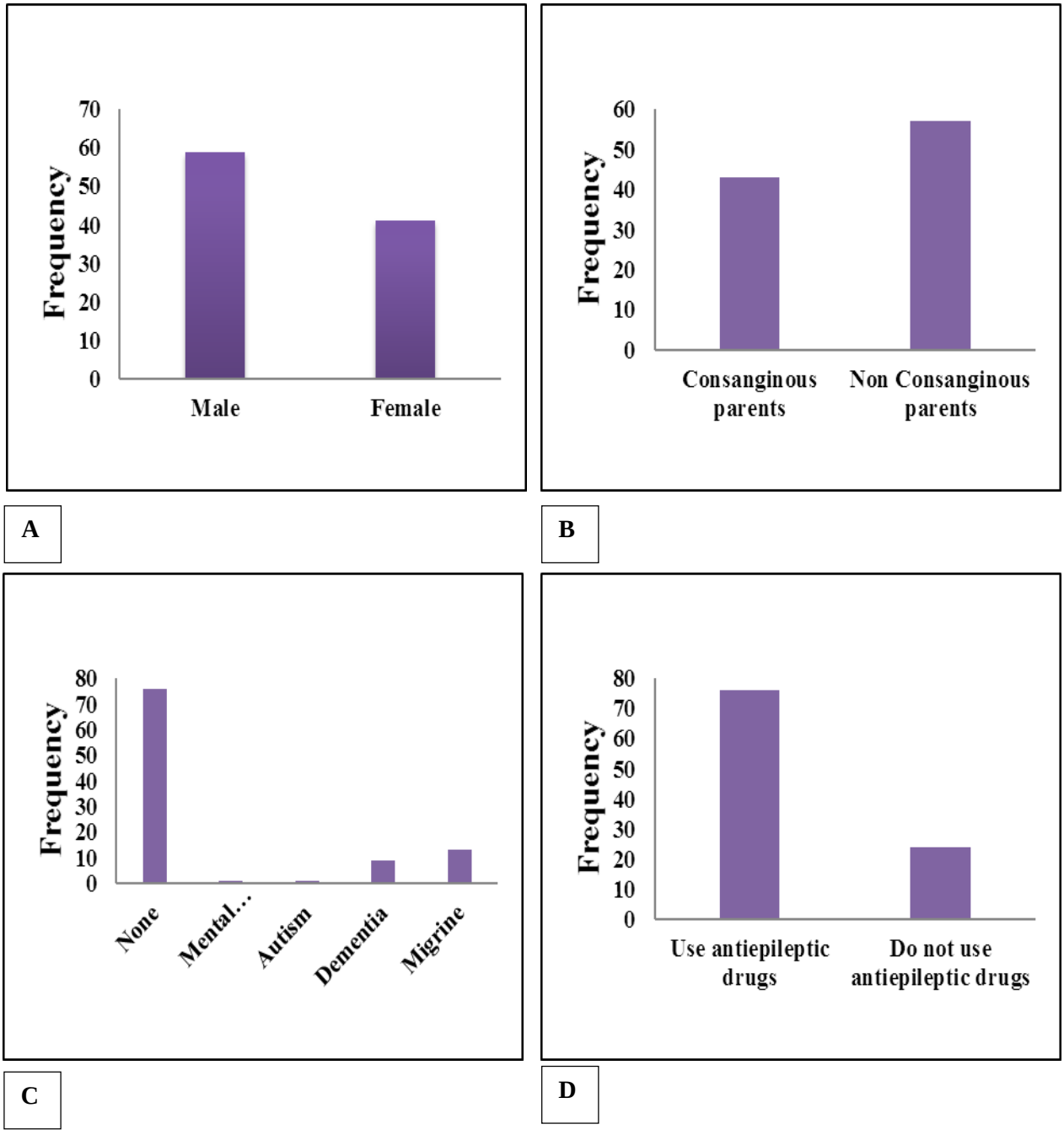

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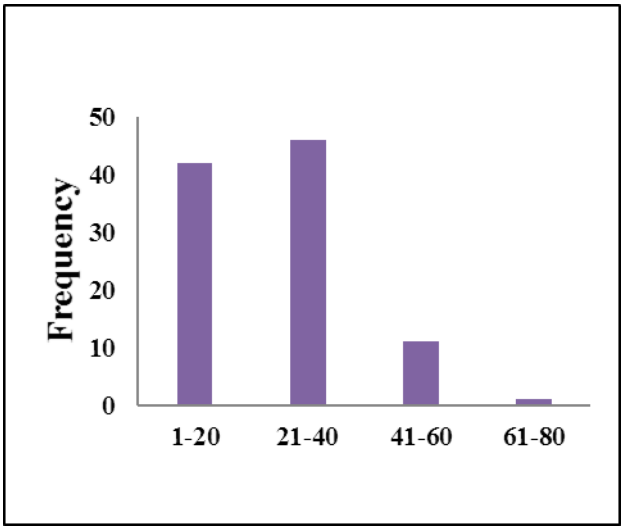
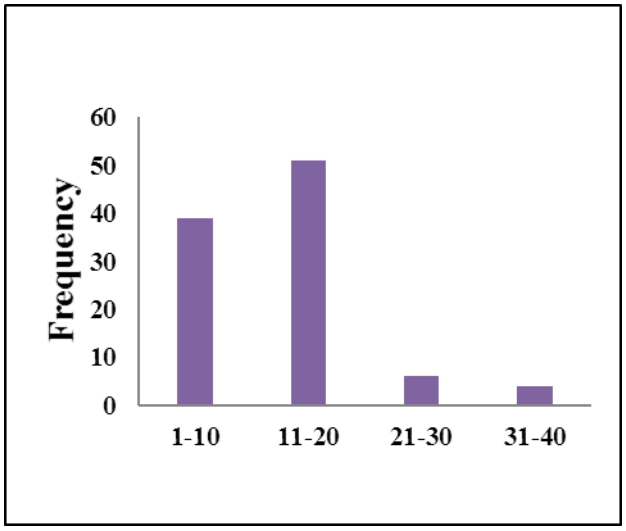
Fig 2: A. Frequency of patients in various age group B. Frequency of diagnosis age of disease C. Frequency of onset age and gender of disease D. Frequency of type of seizure



A



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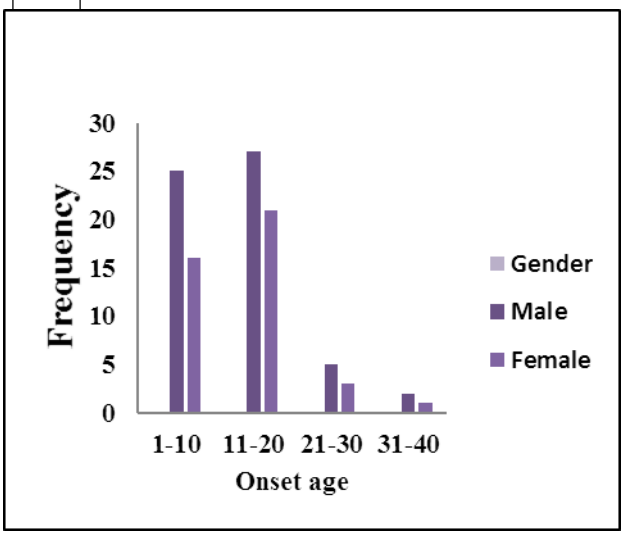

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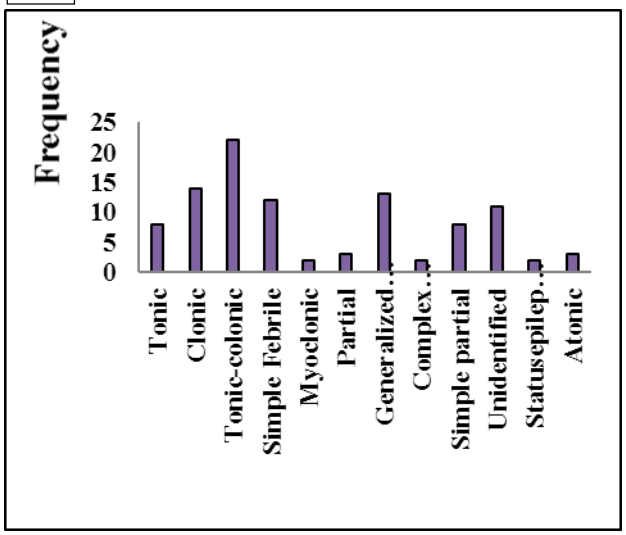

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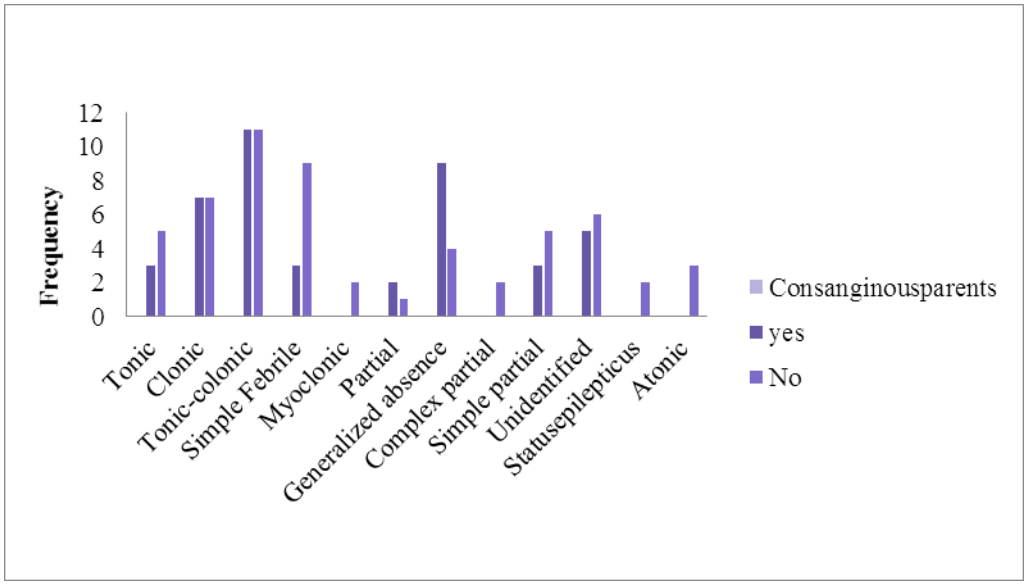
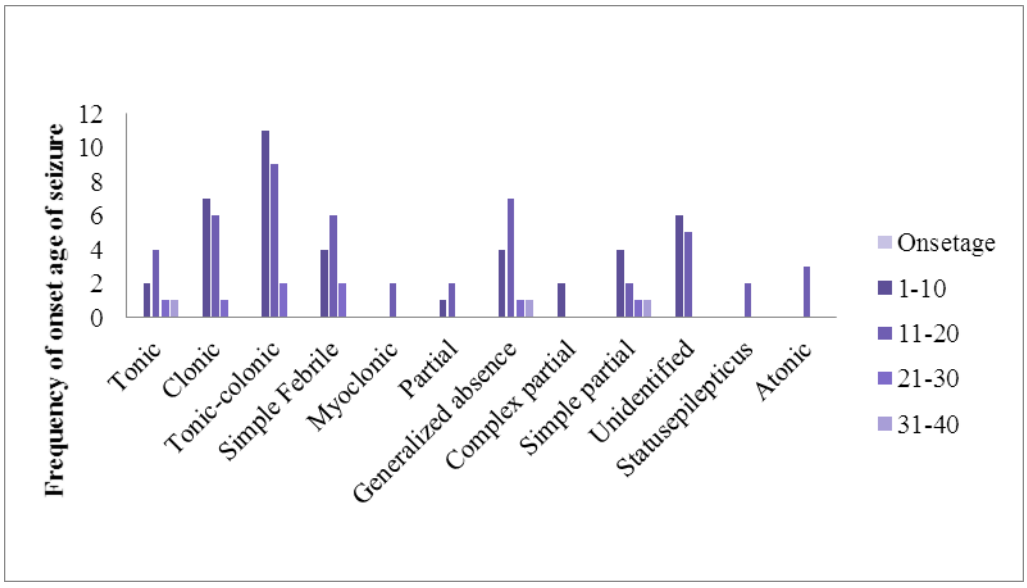
Fig 3: A. Correlation between seizure type and consanguineous parents B. Correlation between seizure type and onset age



A



B