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EPILEPSY IN PAKISTANI ADOLESCENTS AMID THE VAPING EPIDEMIC

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Respected Editor,

Epilepsy accounts for 36% of the global neurological disease burden in children. Especially among low-income countries like Pakistan, the prevalence of epilepsy is estimated to be 9.99 per 1000 population, with the highest percentage below the age of 30.[1] It is specifically concerning considering the recent surge in electronic cigarette (e-cigarette) use in Pakistan and its adverse neurological side-effects like seizures, altered neuromotor behaviour, and memory deficits. The recent data shows that 6.2% of the Pakistani population consumes e-cigarettes/vapes. According to the reports of the Tobacco Control Cell, Pakistan, up to 1200 adolescents begin smoking every day, and approximately 5% use vapes.[2] It is a significant issue given the several reported cases to the Food and Drug Administration (FDA) of seizure induction after e-cigarette use.

Most of such cases reported e-cigarette use eliciting seizures in the epileptic population. A case series highlighted the association between e-cigarette usage and seizures, with 85% of young adults experiencing them within 24 hours and 62% within 30 minutes of the last use.[3]

With the advent of Artificial Intelligence, post-vaping seizure induction can be effectively detected. Recently, Wei et al. successfully designed a machine learning-based, automatic seizure detection system for children and adolescents using electroencephalograms, which exhibited 98.95% accuracy.[4] Such AI-based models can detect abnormal electrical activity after e-cigarette use and can warn epileptic patients about a potential seizure. If adopted in an underprivileged medical setup like Pakistan, they can reduce the healthcare burden, physician dependency and prove to be life-saving for epileptic patients.

While diagnostic efficiency is vital, prevention of e-cigarette use should be taken into account, which warrants immediate commencement of mass media campaigns. With the recent advancements, AI can be deployed for effective digital vaping prevention campaigns. A study by Sheeran et al. showed that AI accurately simulates adolescent responses to vaping-prevention messaging while highlighting the most persuasive elements of the campaign.[5] Therefore, these models can be adopted in real-life settings to craft culturally appropriate, neurologically safe messaging for the highly susceptible epileptic population in Pakistan. It can also help to test the content and distribution system of messaging, ensuring that the government budget in prevention campaigns is put to the right use.

REFERENCES

1. Khatri IA, Iannaccone ST, Ilyas MS, Abdullah M, Saleem S. Epidemiology of epilepsy in Pakistan: review of literature. J Pak Med Assoc. 2003 Dec;53(12):594–7.
2. Khan PDI, Khan JI, Khan R. Impact of educational intervention on smoking knowledge, attitude and behavior of adolescents in schools of developing country (Rawalpindi Pakistan). Int J Med Biomed Stud.2019; 3(3).
3. Liu-Zarzuela JA, Sun R. Three Seizures Provoked by E-cigarette Use in a Five-Year Period: A Case Report. Cureus. 14(8):e27616.
4. Wei L, Mooney C. Pediatric and Adolescent Seizure Detection: A Machine Learning Approach Exploring the Influence of Age and Sex in Electroencephalogram Analysis. BioMed Informatics. 2024 Mar;4(1):796–810.
5. Sheeran P, Kenny A, Bermudez A, Gray K, Galper EF, Boynton M, et al. Artificial Intelligence Simulation of Adolescents' Responses to Vaping-Prevention Messages. JAMA Pediatr. 2024 May 1;178(5):504–6.

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