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| **ORIGINAL ARTICLE** |

**Risk Factors of Abnormal Computed Tomography Scan in Patients Presenting to Emergency Department Following Seizure; a Cross-Sectional Study**

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| Abstract |  |
| **Introduction:** Determining the need for performing brain imaging for patients presenting to emergency department following seizure is one of the most important questions that emergency medicine specialists face. The present study has been designed with the aim of evaluating risk factors of abnormal computed tomography (CT) scan in patients presenting to emergency department following seizure. **Methods:** This cross-sectional study was performed on patients with seizure presenting to the emergency department of Shohadaye Tajrish Hospital from April 2017 to March 2019 using convenience sampling. Demographic data and factors possibly related to presence of brain pathologic findings in patients were gathered and their correlation with findings of CT scan, performed for all patients, was evaluated. **Results:** 352 patients with the mean age of 34.99 ± 22.30 (6 months to 95) years were evaluated (58.8% male). Most studied patients (40.9%) had an education level less than high school diploma. 164 (46.6%) patients had a history of seizure from childhood or as a congenital disorder and 86 (24.4%) had a family history of seizure. 51.1% consumed anti-seizure medications and 31.8% would regularly take medications. Recent lack of sleep with a frequency of 174 (49.4%) cases and heavy physical activity before seizure with a frequency of 11 (3.1%) cases had the highest and lowest frequencies among predisposing factors of seizure. 138 (39.2%) patients had at least one pathologic finding in their brain imaging. The most common findings were subdural hemorrhage (7.1%) and brain tumors (6.8%), respectively. Based on these findings, a significant correlation was observed between age over 40 years (p < 0.001), supine position at the time of seizure (p < 0.001), positive history of seizure in childhood (p < 0.001), positive family history of seizure (p < 0.001), consumption or ceasing to consume anti-seizure medication (p < 0.001), acute head trauma (p < 0.001), consuming anti-coagulant medication (p < 0.001), presence of fever (p < 0.001), positive history of malignancy (p < 0.001), focal seizure (p < 0.001), and headache (p = 0.003) with abnormal CT findings. However, there was no statistically significant correlation between sex, time of seizure onset, education, drug abuse, presence of seizure stimulating factors, focal neurologic disorder, and altered level of consciousness with presence of pathologic findings in brain CT scan. **Conclusion:** Based on the findings of the present study it seems that using a series of clinical decision rules, we might be able to predict the probability of pathologic findings being present in the CT scan of patients with seizure and avoid brain imaging in cases with low probability.**Keywords:** Seizures; tomography, x-ray computed; neuroimaging; clinical decision rules |
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