

Variability of Phenytoin Serum Level in prophylaxis of Seizures in TBI Patients

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Abstract:

Introduction: Traumatic brain injury (TBI) is one of the most common causes of seizure and about 10% of patients with severe and moderate trauma develop seizure. Phenytoin is an anti-seizure medicine which is widely prescribed to prevent seizure in TBI patients. Even it has non-linear pharmacokinetics in therapeutic concentrations, the prescription of which necessitates continuous evaluation of plasmatic level of medicine and regulating the dosage.

Objective: This study aimed at surveying the variability of Phenytoin serum level in TBI patients in Poursina Teaching Hospital to determine the dosage of medicine more precisely to reach the Prophylactic level.

Materials & Methods: In a descriptive longitudinal study, 90 patients of Trauma Ward of Poursina Hospital were studied. Phenytoin serum level was estimated in first, second, and seventh day after hospitalization by using RAN DOX kits, the results were then analyzed by SPSS software (ver16). Exact Test, Fisher, and Pearson T-test were utilized to analyze the data.

Results: Out of 90 studied patients, 79 (87.7%) were men and 11(12.3%) women. Mean age was estimated 36.3 ± 15.6 for men and 41.7 ± 16 for women. There was no significant difference between the Phenytoin level in first and third day in two groups. The Phenytoin serum level in 24 first hrs didn't reach therapeutic level in 75.6% of patients. The average of Phenytoin serum level was in therapeutic level in third day and Phenytoin serum level didn't reach

therapeutic level only in 5% of patients ($p \geq 0.05$). This average figure was 20-30 mg/dl in more than half of the patients on seventh day, during which all patients reached therapeutic level ($p \geq 0.05$). A significant relationship was observed between age and Phenytoin serum level in all three levels ($p < 0.05$).

Conclusion: Phenytoin is considered as an anti-seizure medicine which is vastly used in TBI victims. Using Phenytoin requires exact monitoring due to its limited therapeutic range and linear pharmacokinetics. Since the changes of medicine dosage can lead to blood poisoning and make the medicine ineffective, its prescription needs much more attention regarding its gender, age, and needed dosage.

Keywords: Phenytoin, Serum level, Prophylaxis, Seizure, Traumatic brain injury