PREDICTORS OF MORTALITY IN VERAPAMIL OVERDOSE: USEFULNESS OF SERUM VERAPAMIL CONCENTRATIONS

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Abstract

Introduction: Verapamil poisoning may result in life-threatening cardiovascular morbidities and fatalities. To date, prognosticators of mortality have been poorly investigated and the use of serum verapamil concentration for prognosis remains unclear. We aimed to evaluate the ability of usual clinical and laboratory parameters including serum verapamil concentrations measured on admission to predict outcome (survival versus death) in verapamil poisoning.

Methods: We reviewed the medical records of all intentional and symptomatic verapamil poisonings admitted over eight years to two medical intensive care units (ICU). Clinical and laboratory parameters were measured in 65 patients and final outcomes of survival or death recorded. A multivariable analysis was conducted to evaluate the prognostic values of recorded parameters. Results are expressed as medians [25%-75% percentiles]. Mann-Whitney tests were used for between-group comparisons.

Results: Life-threatening complications of verapamil poisonings included shock (62%), atrioventricular blocks (24%), sinoatrial blocks (20%), acute respiratory distress syndrome (19%), and cardiac arrest (11%) resulting in death (8%). Admission serum verapamil concentration (1.81 µmol/L [1.24-3.73]) was the parameter which differed most significantly between survivors and fatalities (p=0.002). Serum norverapamil (1.45 µmol/L [1.15-1.93]) did not differ between survivors and fatalities according to outcome. Six of eight patients with verapamil concentrations >5 µmol/L suffered cardiac arrest. Of these six, five required ECLS for refractory cardiac failure, but only one survived. Using a multivariate analysis, systolic blood pressure, serum alanine aminotransferase, and verapamil concentrations measured on ICU admission were the three independent factors associated with mortality (p=0.01). The optimal verapamil cutoff point was 5.0 µmol/L (100% sensitivity, 91% specificity), which conferred a 2.8-fold increase in odds of fatality.

Conclusions: In symptomatic verapamil poisonings, cardiovascular monitoring and assessment of organ failure including liver enzymes are vital. The serum verapamil concentration has excellent prognostic ability for predicting fatality in verapamil overdose.