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COMPARISON OF ACETAMINOPHEN - AMINOTRANSFERASE MULTIPLICATION PRODUCT VERSUS PSI PARAMETER IN PREDICTING HEPATOTOXICITY SECONDARY TO ACUTE ACETAMINOPHEN OVERDOSE

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Background: Acetaminophen (APAP) is a common drug involved in deliberate drug overdose that can cause hepatotoxicity. Prediction of the hepatotoxicity risk is an important part of individualised therapy for patients with acute acetaminophen overdose. Acetaminophen concentration and aminotransferase multiplication product (AAMP) and psi parameter (psi) have been reported to be significant predictors of hepatotoxicity secondary to acute acetaminophen overdose. However, their predicting abilities for hepatotoxicity have never been compared.
Objective: We are reporting the validity in predicting hepatotoxicity secondary to acute acetaminophen overdose of AAMP and psi and comparison.
Methods: This is a retrospective review of patients with acetaminophen who were treated with N-acetylcysteine (NAC) at Siriraj Hospital, Bangkok, Thailand during January 2004- June 2012. Only patients with available information on time of ingestion, initial acetaminophen and transaminase levels, time of onset of NAC and outcomes were enrolled. Initial acetaminophen concentration and highest value of simultaneously sampled aminotransferase were multiplied to obtain AAMP. Psi parameters were derived from initial acetaminophen level, blood sampling time and lag time from APAP ingestion to NAC therapy. Hepatotoxicity is defined by aminotransferase over 1000 IU/L and is the gold standard. The cut-off value for AAMP is 1500 $mg.IU/L^2$.
Results: Two hundred and fifty-five patients were enrolled in this study. Thirty two cases (12.5%) developed hepatotoxicity. The AAMP has sensitivity and specificity of 90.6% and 62.8%, respectively for predicting hepatotoxicity. The areas under the curves (AUC) of the receiver operating characteristic (ROC) of AAMP and psi were 0.81 and 0.96, respectively. The difference was statistically significant (p=0.002).
Conclusions: This is the first study to compare psi and AAMP. Psi parameter is shown to be superior to acetaminophen concentration and aminotransferase multiplication product in predicting hepatotoxicity secondary to acute acetaminophen overdose. Both of the predictors have their own strengths. If the times of ingestion and NAC onset are available, psi is recommended for prediction of hepatotoxicity. While, AAMP will be useful when either the time of ingestion or time of NAC initiation is not obtainable and only acetaminophen and aminotransferase levels that are drawn at the same time are available.