

EVALUATION OF THE “CHE CHECK MOBILE” ACCURACY IN MEASUREMENT OF ACETYLCHOLINESTERASE AND PLASMA CHOLINESTERASE IN ANTICHOLINESTERASE POISONING

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Objectives: Acetylcholinesterase (AChE) and plasma cholinesterase (PChE) are biomarkers of exposure to organophosphorus (OP) and carbamate poisoning. They are used in the clinical management to confirm the diagnosis and indicate the severity of poisoning. ChE check mobile is a portable cholinesterase testing system developed in Germany. The aim of this study is to evaluate the ChE check mobile compared to the Testmate ChE and standard laboratory reference methods.

Methods: Patients admitted to two general hospitals in Sri Lanka with a history of organophosphorus and carbamate poisoning between September 2013 and November 2014 were recruited and the AChE was measured using the 3 methods. PChE was generally only measured with the ChE check and standard methods and done in fewer patients.

Results: Blood samples were collected on 20 normal individuals and 185 self-poisoned patients (15 Carbamate and 170 OP). Overall, there was good correlation between the Spectrophotometer and Testmate AChE level from OP patient's samples consistent with previous studies but the ChE check results AChE results were generally over-estimated compared to these methods. The Bland Altman analysis showed the mean bias and 95% limits of agreement for Check mobile - Testmate, Check mobile - Spectro and Testmate - Spectro were 6.5 (-5 to 18), 7.1 (-10 to 24) and 0.04 (-11 to 11) respectively.

58 patient's samples were analysed for PChE. Mean bias with 95% limits of Agreement (Check mobile - Spectro) was -528 (-2169 to 1113).

Conclusions: The Check ChE mobile system allowed for rapid determination of AChE and PChE activities however over-read AChE and under read PChE compared to other methods. The differences could be related to blood collection issues (blood for this test is collected in capillary tubes) as well as reflecting the machine itself. The Testmate ChE appeared to be a more accurate portable machine in this setting.