OP-23
Evaluation of RBC acetylcholinesterase point of care testing using "CHE check mobile" in diagnosis of organophosphate poisoning

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Objectives: Organophosphate poisoning (OPP) in the setting of deliberate self-harm (DSH) is an important cause of morbidity and mortality in India. Cholinesterase estimations for diagnosis of OPP are not widely available in community hospitals. CHE check mobile is a point of care test (POCT) which has been validated for monitoring occupational exposure. The aim of this study was to validate CHE check mobile in the diagnosis of acute OPP and to determine its role in predicting clinical outcomes.

Methods: Cases: Acute OPP in adults, Controls: non-OP poisoning (10 cases) and healthy controls (40 controls). Cases had RBC AChE and BChE levels measured by POCT on admission, after 12 hours and then daily for 7 days. RBC-AChE and plasma BChE laboratory measurements were performed using a modified Ellman's assay on blood samples drawn at the same intervals. Patients were assessed for intermediate syndrome, need for and duration of mechanical ventilation, and ICU care.

Results: Of 59 OPP patients, 49.2% had severe poisoning (Namba scale) and 59.3% required ICU care and mechanical ventilation. The mean RBC AChE and BChE levels (POCT) in healthy controls were AChE 38.22 U/gHb (±12.2) and BChE 2906.66 U/L (± 1312.84) respectively. There was good correlation between the POCT and laboratory measurement of AChE and BChE among normal, non-OP poisoning controls and OP poisoning patients: (1) AChE (check mobile) correlation coefficient was 0.743($p<0.001$); BChE (check mobile) correlation coefficient was 0.875 ($p<0.001$). The sensitivity and specificity of AChE (POCT) at a value of ≤ 25U/gm Hb in diagnosing OP poisoning was 100% and 84.75% respectively, with a positive predictive value of 100%. There was a significant correlation between admission RBC AChE (POCT) and severity of poisoning ($p=<0.001$), need for ICU care ($p=<0.001$), mechanical ventilation ($p=<0.001$) and development of intermediate syndrome ($p=0.021$). A level of ≤ 10 U/gHb at admission predicted the development of intermediate syndrome, requirement for ICU care and need for mechanical ventilation. Sequential enzyme measurement had no prognostic significance in clinical decision making.

Conclusion: The RBC AChE "Rapid Check mobile POCT" is a valid and reliable test to distinguish between OP poisoning and non-OP poisoning at admission and predicts the need for ICU care, mechanical ventilation and intermediate syndrome.