

Serial Monitoring of Acetyl Cholinesterase and Butyryl Cholinesterase Levels in Patients with Acute Organophosphorus Poisoning

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Objective : This study was to determine if changes in enzyme activity of Butyrylcholinesterase (BChE) and red cell Acetylcholinesterase (AChE) (1) could be used to follow the clinical progress of the patients with acute OP poisoning and their response to treatment. **Methods**: Patients were enrolled if admission BChE was <1000 U/L and randomised into three treatment arms: albumin (n=19) who received 20% albumin; fresh frozen plasma (FFP) (n=18); saline placebo (n=17). Specimens were taken at admission; second and third day after admission; and at discharge. **Results** : Fifty four patients with OP self poisoning were enrolled in this study during 2007 to 2008. The patient cohort consisted of 44 males and 10 females. The mean age was 30.02 ± 13.01 years. The median duration of hospitalization was 7 days (2-41). Nine patients expired during treatment. Both cholinesterases were highly inhibited on day 1 in all the three treatment arms. The median AChE values at admission were 20.5 U/ μ mol Hb (range 0.01-79.5), day 2 – 13.1U/ μ mol Hb (range 0.01-77.1), day 3 -18.5 U/ μ mol Hb (range 0.01- 79.8), discharge- 19.6 U/ μ mol Hb (range 0.01-49.7), respectively. Reference values in 21 subjects were median 106.6 U/ μ mol Hb (range 87.7- 185.4). The serial changes in BChE activity are shown in figure1. Reference values for BChE were median 7922 (range 4902 – 11924 U/L). **Conclusions** : Recovery of BChE occurred in the FFP arm, but was much slower in the saline and albumin arm. BChE present in the FFP may have been responsible. AChE values were depressed on day 1 and did not recover in any group by discharge. They could not be used to monitor clinical progress of the patients. **Reference**: 1. Worek F, Mast U, Kiderlen D et al. Improved determination of acetylcholinesterase activity in human whole blood. Clin Chim acta 1999; 288: 73-90.

Figure 1. Serial monitoring of BChE values

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