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PULSE CO-OXYMETER; A DE-FACTO MONITORING DEVICE IN ALUMINUM PHOSPHIDE, A NOVEL APPROACH

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Introduction: Diagnosis of aluminum phosphide (ALP) poisoning in early stages is important for providing enough intensive care and early interventions. We incidentally discovered that carboxyhaemoglobin (CO-Hb) level is elevated by pulse CO-oxymeter in ALP poisoned patients but spectrophotometric method didn't confirm it. The current study was done to compare outcomes by CO-Hb levels measured by pulse CO-oxymeter in ALP suspected patients.

Material and Method: All ALP suspected patients who referred to Loghman-Hakim Hospital between March and May 2012 were included in this pilot study. The collected data included the patient's age, gender, ingested dose, gastric and exhalation silver nitrate test, time post ingestion, Co-Hb level, blood pressure and blood gas analysis in different time intervals, until death or discharge. Continuous data were analysed using the Student t-test if the data were normally distributed; otherwise the Mann-Whitney U-test was used. Categorical data were compared using Pearson's chi square test. A p value less than 0.05 was considered to be statistically significant.

Results: Fifty patients with mean age of 23±6 years (range 13-36) and history of "rice tablet" exposure, suspected to ALP poisoning were included. Twenty-four (48%) men and 26 (52%) women that hospitalised from half to 20 hours post ingestion. Among deceased (18, 36%), mean tablets ingested was 2.2± 2.1 (range 0.5-10) which was not significantly higher than lives; 1.6±1.3 (range 0.1-6). There were significant differences in mean CO-Hb level between deceased and survived in 0.5-3 hours post ingestion (mean 28.3%±13.5% (range 8%-44%) vs 9.6%±5.9% (range 1%-20%) ($p<0.002$); 6-12 hours (mean 25.4%±7.5% (range 13%-38%) vs 7%± 6.2% (range 1%-21%) ($p<0.001$); 12-24 hours (mean 20.1%±7.4% (range 7%-28%) vs 7.7%±4.4% (range 1.5%-16%)($p<0.001$); 24-48 hours (mean 18%±9.9% (range 11%-25%) vs 5.3%±5.1% (range 0% -19%)($p<0.01$). In those silver nitrate tests were done (34 cases), there were 4 cases (11.7%) in which neither gastric silver nitrate tests nor exhalation test were positive while they died. The mean 6- 12 hour CO level in deceased was 28.3%±7.5% (range 21%-38%) vs 7.7%±5.9% (range 2%-18%) in lives one ($p<0.001$).

Conclusion: It seems haemoglobin is affected by phosphine and produce a dyshemoglobin interfere with CO light absorption and measure it. Definitely silver nitrate test cannot detect some ALP exposures. It seems pulse Co-oxymeter is a better tool for detecting ALP exposure and may predict prognosis. This theoretical prediction could use as a de-facto monitoring device for ALP intoxication.