EFFECT OF SINGLE LARGE DOSE ALUMINIUM PHOSPHIDE POISONING ON NEURO-COGNITIVE FUNCTION

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Objectives: Aluminium phosphide is a highly effective insecticide and rodenticide. Aluminium phosphide poisoning affects many organs and mainly causes cardiac toxicity manifesting as circulatory failure and hypotension. This study been conducted to study the effects of aluminium phosphide poisoning on CNS.

Methods: It was a prospective cohort study done in themedical Emergency, Department of Internal Medicine, PGIMER, Chandigarh, tertiary care centre in North India. A total of 20 cases of acute aluminium phosphide poisoning were included in the study out of which 6 have been followed till now. The diagnosis of AlP_3 poisoning was based on history of consumption and characteristic clinical features, severity on PGI scoring [pH <7.2 , systolic BP < 90 , GCS < 13]. Unknown compound poisoning and patient with h/o cognitive dysfunction prior to poisoning were the exclusion criteria. All patients who survived the acute insult were taken up for the study within 7 days. Brain SPECT, perfusion MRI, and clinical neurocognitive testing were be performed on these patients after stabilisation and repeated at 6 weeks and 3 months.

Results: Out of the 6 patients in the study, 2 were found to have abnormalities in brain perfusion as detected by Brain SPECT. Both these patients along with all the others had normal perfusion on perfusion MRI. The PGI scoring for severity of these two patients were 1 and 2 respectively. On follow up the abnormalities showed a resolving trend. Memory was affected in all the 6 patients at baseline with a trend towards improvement, although abnormalities still persisted at 3 months follow up. The trail making test for attention, sequencing, mental flexibility and of visual search and motor functions was abnormal in 3 patients at baseline, it improved in 1 and persisted in 2 at follow up. Test for verbal fluency was abnormal in all the patients at baseline, and persisted in all except 1 at follow up. The BVMG test for perception and visual motor function was abnormal in all the patients at baseline, with significant defects persisting at follow up in all except 2. Perseveration, abbreviation and point contact were the most common abnormalities.

Conclusion: Single large dose aluminium phosphide consumption was associated with abnormalities in brain perfusion in the acute phase as detected by Brain SPECT. Significant defects in neuro-cognitive function, including memory, verbal fluency, perception and visual motor function, attention, sequencing, mental flexibility, visual search, occurred following stabilization in the acute phase, these abnormalities showed an improving trend at follow up, although significant defects still persisted.