

Stimulated single fiber electromyography in orbicularis oculi muscle in carbamate insecticide poisoned patients: a preliminary study

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Intentional poisoning using carbamate pesticides are commonly seen in countries like Sri Lanka with high morbidity according to the World Health Organization. This study was conducted to assess the neuromuscular junctional impairment seen in carbamate patients using single fiber electromyography (sfEMG) in the view of developing it as a marker to predict the morbidity. Carbamate acts as a reversible inhibitor of acetylcholine esterase enzyme present in the neuromuscular junction. This is the first such series of carbamate patients (17) that had been investigated.

The study was conducted in the Toxicology Unit and the Neurophysiology Unit of the Faculty of Medicine, Peradeniya. sfEMG was conducted within 24 hours and every other day on carbamate ingested inward patients. The patients who were admitted with > 2 cholinergic features were recruited. Patients with 3/4 clinical criteria: neck muscle weakness, proximal muscle weakness, ophthalmoplegia and respiratory failure were clinically diagnosed as intermediate syndrome (IMS), sequelae of the poisoning seen between 24-96 hours. In these patients zygomatic branch of the facial nerve was stimulated and sfEMG was recorded from orbicularis oculi muscle using a concentric needle electrode.

The number of carbamate ingested patients examined was 17 (males: 15, age: 23-65 years). Mean duration of the stay in hospital was 115 hours (range: 24-216 hours). The number of patients who were clinically diagnosed with IMS was 10, out of which 7 had increased jitter between 24-96 hours. The odds ratio of having IMS in patients with increased jitter and with normal jitter was 5.83 (95% confidence interval: 0.49 – 86.29, Fisher's exact test $P = 0.15$).

Normal jitter for orbicularis oculi muscle is 39.8-43.7 μ s. Higher values were observed within 24-96 hours in 7/10 patients who were diagnosed as IMS. The likelihood of having an increased jitter value in those with IMS is 5.83 times greater than in others who were not diagnosed with IMS. The correlation was clinically significant indicating the need to study a larger sample.

As higher jitter values are seen in IMS patients, it is necessary to study a larger sample that had ingested carbamate, in order to develop sfEMG as a marker to predict the occurrence of IMS.