OP – 40

The clinical toxicity of Imidacloprid self-poisoning following the introduction of newer formulations

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Objective: Self-poisoning with Imidacloprid has been previously shown to have low toxicity in humans. Since 2007 newer formulations of Imidacloprid with unknown solvents have been introduced. Kohinoor Imidacloprid (2007), Provado Imidacloprid (2007) and Gaucho 70 WS (2009) are common newer formulations introduced and the potential clinical consequences of these products have not been described.

Methods: Clinical and demographic data were prospectively collected from admissions following oral ingestion of Imidacloprid from seven hospitals in Sri Lanka. Data was collected from 2002 to 2007 in an already published study. We compared this data on poisonings collected from 2009 to 2016 following the introduction of new formulations of Imidacloprid.

Results: From 2002-2007, there were 61 patients with exposure to Imidacloprid compared to 68 patients post 2009. The median time to presentation prior to 2007 was 4 hours (IQR 2.3 – 6.0 hrs) and post 2009 was only 1.0 hr (IQR 0.4 to 1.6 hrs). The median amount ingested was 15 ml (IQR 10.0-50.0 ml) prior to 2007 and 27.5 ml (IQR 5.0 – 71.8 ml) post 2009. In both studies most patients developed non-specific symptoms including nausea, vomiting, epigastric pain and headache. However, prior to 2007 only 3.2% of the cohort required mechanical ventilation due to respiratory failure and there were no reported deaths. In contrast, post 2009; deaths occurred in 3.2% of the cohort and 5.9% required mechanical ventilation for respiratory failure. The two deaths were cardiorespiratory failure and a prolonged admission following Imidacloprid self-poisoning complicated with lobar pneumonia and decompensated liver failure.

Conclusion: Although acute exposure to Imidacloprid is usually associated with mild non-specific symptoms, since the introduction of new formulations of Imidacloprid, the toxic profile has changed with reported cases of death as well as an increase in cases requiring mechanical ventilation. The change in toxicity could be due to the solvents used in the newer formulations. Further research into these solvents needs to be done and continued toxico-vigilance is required.