GELSEMIUM POISONING BY PROXY; DELINEATION OF MECHANISM

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Objectives: *Cassytha filiformis* (無根藤) is a non-toxic parasitic plant used as a medicinal herb in many cultures. Within 12 months, the Laboratory received referrals of five cases in two clusters who presented with plant-related poisoning after intake of presumably *C. filiformis* obtained from hillsides. The clinical presentations of these patients included dizziness, vomiting, ptosis and generalised weakness, approximately one hour after ingestion of the herbal broth prepared from solely this plant. The clinical features were suggestive of gelsemium poisoning. We characterised and postulated the mechanism of poisoning in these patients.

Methods: Urine samples, herbal broth samples and unused plant materials were collected from the patients where available. *C. filiformis* parasiting on *Gelsemium elegans* (斷腸草) was also collected from a hillside by an author. These samples were analysed by various chromatographic and mass spectrometry techniques. The unused plant materials from the patients and the plant specimen collected by the author were further identified by their morphological features and DNA barcoding.

Results: Urine and herbal broth samples were available from all patients and unused plants were available from two. In the plant materials obtained from the patients and the plant specimen collected by the author, a similar chemical profile was detected, which showed the presence of gelsemium alkaloids (gelsemine, humantenmine/gelsenicine, humantenirine, markers of *G. elegans*) and aporphine alkaloids (norneolitsine, neolitsine, actinodaphnine, cassythine, markers of *C. filiformis*). Furthermore, gelsemium alkaloids and aporphine alkaloids were detected in all herbal broth samples, and gelsemium alkaloids were detected in the urine samples of two patients. Morphological identification and DNA barcoding confirmed that the unused plant materials obtained from the patients as well as the plant specimen collected by the author were *C. filiformis*. ***Conclusions:*** The findings confirmed clinical gelsemium poisoning in these patients. The biochemical profile, morphological identification and DNA barcoding results of the plant materials obtained from the patients clearly demonstrated that the source was *C. filiformis*, a supposedly non-toxic plant, which however contained toxic gelsemium alkaloids. Since *C. filiformis* is a plant parasiting on various hosts including *Gelsemium* species, we postulate that the gelsemium alkaloids present in the unused plant materials were taken up from the hosts of *Gelsemium* species via the haustoria by *C. filiformis*. The findings in the specimen of *C. filiformis* parasiting on *G. elegans* collected by the author further support our postulation of this interesting mechanism of poisoning.