Identification of Sinicuichi Alkaloids in Human Blood and Urine After Intoxication Caused by Oral Intake of a Heimia Salicifolia Extract

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CASE REPORT: A 26 year old male came to the hospital around midnight complaining about muscle pain of the extremities and the tongue and slightly raised temperature. In the evening and during the night nausea, headache, singular vomitus and ague occurred. C-reactive protein and leukocyte levels were at normal range while creatinine kinase was increased. The patient reported the intake of an unknown amount of sinicuichi tea that had been fermented over 24 h by adding yeast and sugar. The patient was treated with dimenhydrinate (Vomex A⁵) and released from the hospital the following afternoon.

Dried plant material of Heimia salicifolia, a species of the lythraceae family basically found in Central and South America, is sold as “sinicuichi” by several internet shops. Brewed up or fermented and consumed, the so called sinicuichi tea causes exhilarating feelings and an alteration of awareness accompanied by bradycardia, relaxation of the muscles and a pleasant faintness. Some species of the lythraceae family contain a number of biphenyl quinolizidine lactone alkaloids. Their pharmacological properties are not yet fully known. Vertine (cryogenine), the alkaloid showing the highest concentration in the plant material, is considered to be the primary source of the effects of traditional heimia salicifolia brew like anticholinergic, anti-inflammatory, sedative, tranquilizing and spasmyloytic activity. Sinicuichi brew and heimia leaves are widely used for medication by the natives of Central and South America.

METHODS: A blood and urine sample taken shortly after submission and the plant material used were available for analysis. Applying the routine urine and blood screening methods (GC-MS and HPLC-DAD) did not lead to the identification of exogenous substances. After liquid extraction with acetone five different alkaloids were detected in the plant material by our standard LC-MS screening method. This first analysis was carried out with an LC-MS/MS system operated in the Q1 scan mode applying a TurboIonSpray source. Chromatographic separation was achieved using a Synergi Polar RP column applying a gradient elution with a total flow of 0.25 mL/min and a runtime of 30 min. The information of the acquired spectra was used to set up a multiple reaction monitoring method (MRM) using two transitions per analyte. For MRM screening the chromatographic gradient was shortened to 15 min.

RESULTS AND CONCLUSIONS: Applying this MRM method to the patient’s blood sample after liquid-liquid extraction, two of the five heimia alkaloids were detected qualitatively in the extract confirming the ingestion.

Keywords: Sinicuichi, Herbal drug, LC-MS/MS