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Farming 1

Aristolochic acids levels in serum of Chinese herbalists and family members after the ban of herbs containing aristolochic acids in Taiwan

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Abstract

Objectives Aristolochic acids (AAs) are known to be strongly nephrotoxic and carcinogenic. Occupational studies showed that the SMR for kidney cancer were significantly higher for Chinese herbalists. Herbalists are potentially exposed to aristolochic acids while gathering plants, preparing or applying herbal remedies and may also consume more AAs containing herbs. This was the first study to determine the AAs levels in serum of 138 herbalists and 38 family members after five herbs containing AAs were banned in Taiwan in 2003.

Methods A total of 176 subjects were members of the Occupational Union of Chinese Herbalists, recruited between May 2007 and June 2007 in Taiwan. A sample of 5 ml serum was collected for aristolochic acids determination by ultra-performance liquid chromatography-tandem mass spectrometry.

Results The method exhibited good linearity over the concentration range of 0.05-100 ng/ml with correlation coefficients $r > 0.995$. Under optimum UHPLC-MS/MS conditions, a total of 34 subjects' AAI levels were detected above the limit of quantification (0.005 ng/ml). The limit of quantification (LOQ) was 0.015 and 0.096 ng/ml for AA I and AA II, respectively, which were sensitive enough for determining AAs levels in human serum. Seven of 176 subjects' AAI levels were over LOQ, and the mean (range) of AAI was 0.07 (0.1–0.04) ng/ml. Only one subject was detected AAII, 0.63 ng/ml.

Conclusions AAI was still detected in 34 (19%) subjects' serum which were collected in 2007, 4 years after the ban of herbs containing aristolochic acids in Taiwan.