Assessment of exposure to chemical elements through the consumption of waters and vegetables for a group of patients in routine dialysis

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This research was conducted in a mineral district, Minas Gerais-Brazil, where there are several lithiniferous pegmatites. The geological and geochemical studies of the area and toxicological results in a risk group as follows. Aluminous metasediments of Macaúbas Group and Salinas Formation occur in the area, as well as aluminous granites (Teixeirinha and Quati) mainly formed by quartz, feldspars, muscovite, biotite, sillimanite, andalusite, cordierite and tourmaline. The drainage and untreated water supply samples, from approximately 80% of the area, were analyzed and the results showed Al values from 0.200 to 0.928 mg/kg, exceeding the Health Ministry recommended levels. The average levels of 3.1% Al in soils and 1059 mg/kg Al in vegetable foods are also high. A group of 16 people on dialysis three times a week and living in the region, was submitted to analysis of blood (plasma). The results show that 94% of this group has blood levels (BL) above 3 µg/L Al, 75% has BL above 10 µg/L , 44% has BL above 60 µg/L, 25% has BL above 100 µg/L, 19% has BL above 200 µg/L and the median BL value is 49 µg/L. Values for the median of BL for 10 other studied elements are: 8.79 µg/L As, 0.22 µg/L Cd, 0.44 µg/L Co, 1051.98 µg/L Cu, 0.45 µg/L Li, 2.12 µg/L Mn, 1.04 µg/L Pb, 266.94 µg/L Rb, 70.42 µg/L Se and 1024.10 µg/L Zn. These results indicate that, in this group of dialysis, only the aluminium has BL in excess that probable was potentiated by exposure through water and food ingestion, which are naturally Al-enriched in the region.

Keywords: Assessment environmental health; geochemical and health; aluminium toxicity in plasma, dialysis group.

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