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A Scoping Review of Heavy Metal Contamination in Traditional Herbal Medicines at Muthurwa Market, Nairobi, and Its Association with Hepatorenal Toxicity: An African Perspective

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Abstract

Traditional herbal medicines are a primary healthcare resource across Africa. Concerns exist regarding their safety, specifically contamination with toxic heavy metals. Muthurwa Market in Nairobi is a significant centre for this trade. Hepatorenal toxicity linked to herbal medicine use is a recognised clinical issue in regions such as Senegal, indicating a potential public health problem. This scoping review aimed to map and synthesise evidence on the prevalence of heavy metal contamination in traditional herbal medicines sold at Muthurwa Market, Nairobi. A further objective was to explore the postulated association between this contamination and hepatorenal toxicity among users within an African context, using Senegal as a focal point. A systematic scoping review methodology was employed. Multiple electronic databases and grey literature sources were searched for relevant studies. Articles were screened against pre-defined inclusion criteria. Data were extracted and charted to identify key themes, evidence gaps, and the scope of the available literature. The limited available evidence indicates a notable prevalence of heavy metal contamination in traditional herbal medicines from Muthurwa Market, with lead and cadmium most frequently reported. The literature consistently describes a biologically plausible pathway linking chronic, low-dose exposure from such products to hepatorenal damage. However, no direct, high-quality epidemiological studies were found that conclusively establish causality

between products from this specific market and clinical hepatorenal toxicity in Senegal. Traditional herbal medicines from Muthurwa Market appear susceptible to heavy metal contamination, representing a potential health risk. The hypothesised link to hepatorenal toxicity is biologically plausible, but a direct causal relationship remains unproven due to a lack of targeted clinical and surveillance data. Implementing standardised regulatory monitoring for heavy metals in traditional herbal medicines at major markets is recommended. Further primary research, including robust epidemiological studies and detailed market-to-patient traceability investigations, is required to establish direct causal links and inform public health policy. traditional herbal medicine, heavy metals, contamination, hepatorenal toxicity, Nairobi, Senegal, Africa, public health. This review consolidates the evidence on a specific environmental health risk within African wilderness medicine, highlighting a critical gap between market-level contamination data and clinical health outcomes. It provides a foundation for targeted regulatory action and future research.