Heavy Metal Content in Breast Milk and Its Associated Factors: A Systematic Review

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Abstract

Breast milk is an important source of nutrition for the growth and development of infants. Breast milk can become a route through which infants are exposed to toxic substances like heavy metals. This research aims to identify variations of trace elements and their associated factors contributing to the existence of trace elements in breast milk. This research employed a systematic literature review methodology utilizing PubMed, Scopus, and Science Direct databases. The search strategy followed specific English keywords to align with the PRISMA Extension for Systematic Reviews guidelines. Data synthesis involved a narrative approach, summarizing the main findings and interventions outlined in the chosen studies. The included articles consisted of full-text primary research published between 2013 and 2023. Detailed exclusion criteria are provided in the complete manuscript. To mitigate potential language bias, only publications in English were considered for inclusion. Our systematic review, comprising nine articles, revealed the presence of toxic metals including lead (Pb), cadmium (Cd), aluminum (Al), copper (Cu), chromium (Cr), mercury (Hg), and arsenic in human milk. Associated factors contributing to this presence include food intake (such as seafood, fruit, and canned fruit), water and canned drink consumption, smoking and exposure to smoke, regional location, and medical conditions. Heavy metals, including lead, cadmium, aluminum, copper, chromium, mercury, and arsenic are present in breast milk, influenced by factors like diet, water consumption, smoking, regional zones, and medical conditions.

Keywords

Heavy Metal, Breast Milk, Water Consumption, Smoking, Regional Zones, Medical Conditions