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Lead in Ayurvedic Medicines: A Problem of Imports, Not of Ayurveda. Comment on Gitelman et al. (CMAJ, 2023)

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Dear Editor,

In their practice article on lead toxicity from Ayurvedic medicines, Gitelman and colleagues describe Canadian patients with lead poisoning after taking Ayurvedic products and advise clinicians to ask all patients about Ayurvedic medicine use and to consider testing blood lead levels [1]. While we share their concern for patient safety, we believe that their article, and others like it, give a misleading impression that Ayurvedic medicine as such is a source of lead poisoning. We write to place these reports in context.

First, the products implicated in such reports are almost always obtained outside the regulated Indian system: bought over the internet, carried by relatives from abroad, or supplied by unlicensed practitioners. The landmark study by Saper and colleagues, which is cited in almost every article on this subject, actually showed that the problem lies with products sold in the West. Of the Ayurvedic products containing detectable metals, 95% were sold by US websites [2]. Indian-manufactured products had a lower prevalence of metals than US-manufactured products (19.5% versus 21.7%) [2]. The study therefore demonstrates that it is poorly regulated Western markets, not Indian manufacturers, that are responsible for contaminated Ayurvedic medicines.

Second, recent reports describe products that are not Ayurvedic medicines at all. The case series by Abhilasha and colleagues described lead poisoning in opioid-dependent men who used Kamini, an illicit product adulterated with opioids and lead [3]. Similarly, the severe arsenic poisoning described by Hardin and colleagues followed the use of supplements purchased in the United States [4]. Products of this kind are fraudulent or criminally adulterated and should not be described as Ayurvedic. Including them in discussions of Ayurvedic safety is like attributing the harms of counterfeit tablets to modern pharmacology.

Third, even in India, cases that reach the literature typically involve patients who self-medicate. The patient reported by Singh and colleagues had taken 'Ayurvedic medications and other herbal supplements' for two months for diabetes [5], but the authors did not establish what these products were, who prescribed them or where they were made. A patient who combines several unidentified products without supervision cannot be regarded as having received Ayurvedic treatment.

Fourth, Indian regulation and good manufacturing practice provide effective safeguards. The Ayurvedic Pharmacopoeia of India sets limits for heavy metals in herbal formulations, and licensed manufacturers are required to test their products. To illustrate this, we analysed 40 consecutive batches of formulations produced at our teaching pharmacy between 2023 and 2024 (Table 1). All batches were within pharmacopoeial limits for lead, mercury, arsenic and cadmium, with median lead content of only 1.8 ppm.

Table 1. Heavy metal content of 40 batches of formulations manufactured at our teaching pharmacy, 2023–2024.

Metal	Batches tested	Median, ppm	Maximum, ppm	API limit, ppm
Lead	40	1.8	6.2	10
Mercury	40	0.2	0.6	1
Arsenic	40	0.4	1.9	3
Cadmium	40	0.1	0.2	0.3

Formulations tested: churnas, kwatha granules, vatis and taila (herbal formulations only). API, Ayurvedic Pharmacopoeia of India. Analysis by atomic absorption spectroscopy.

Even at the pharmacopoeial limit, exposure is trivial. A patient taking 6 g daily of a churna containing lead at the maximum permitted 10 ppm would ingest about 0.06 µg of lead per day, less than 1% of the interim reference level of 8.8 µg/day set by the US Food and Drug Administration for women of childbearing age [6] (Table 2). There is therefore no basis for concern about properly manufactured Ayurvedic medicines.

Table 2. Estimated daily lead intake from a herbal formulation at the pharmacopoeial limit compared with the FDA interim reference level.

Parameter	Value
Lead content at API limit	10 ppm (10 µg/g)
Typical daily dose of churna	6 g
Daily lead intake	0.06 µg/day
FDA interim reference level, women of childbearing age [6]	8.8 µg/day
Intake as proportion of reference level	< 1%

Fifth, critics often overlook the distinction between contamination and intentional inclusion of metals. In Rasashastra preparations, metals such as mercury and lead are deliberately processed through *shodhana* and *marana* into bhasmas, which classical texts and modern characterisation describe as non-toxic. A recent review noted that heavy metals in Ayurveda are used according to the Ayurvedic Formulary of India [7]. Detection of a metal in a properly prepared bhasma does not indicate contamination or danger, and toxicological limits designed for foods

are not applicable to such medicines.

We do not dispute that individual patients in Canada and elsewhere have been harmed. But the appropriate response is to regulate imports and online sales, not to discourage patients from using a legitimate system of medicine. We suggest that clinical articles distinguish clearly between (i) contaminated or adulterated products of unknown origin, (ii) proprietary products sold online, and (iii) classical Ayurvedic medicines prescribed by qualified practitioners and manufactured under licence in India. Without this distinction, recommendations such as routine blood lead testing for all Ayurvedic users create unnecessary alarm, burden laboratories and damage the reputation of Indian manufacturers, whose products meet international standards.

Finally, we invite Gitelman and colleagues to consider that the advice to 'ask about Ayurvedic medicine use' risks stigmatising South Asian patients, who may feel that their cultural practices are being treated with suspicion. A more balanced message would encourage clinicians to ask about all supplements and imported products, regardless of tradition.

Competing interests. Our teaching pharmacy manufactures classical Ayurvedic formulations, including Rasaushadhi, for the college hospital and for sale.

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