A heavy burden: remaining vigilant with herbal remedies

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Case study

A woman aged 34 years presented to hospital with a history of progressive shortness of breath, palpitations, decreased exercise tolerance and generalised arthralgia over the previous month. A full blood count revealed normochromic normocytic anaemia and a haemoglobin level of 66 g/L. The blood film showed basophilic stippling (*Figure 1*), prompting measurement of lead levels. Her blood lead level (BLL) was 105 µg/dL. Mercury and arsenic levels were also detected at very low levels.

On further questioning, the patient reported that in the past 6 months she had ingested multiple herbal preparations supplied by an overseas Ayurvedic practitioner for enhancement of fertility. She was taking up to 12 different tablets and various pastes and powders daily. Her case was reported to public health authorities and the herbal preparations were sent for analytical testing. Analysis confirmed high levels of lead (4% w/w), mercury (12% w/w), arsenic and chromium. The lead levels were 4000 times the maximum allowable lead level in medications sold or produced in Australia.

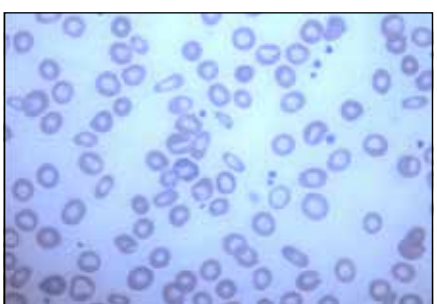

Figure 1. Blood film showing basophilic stippling

Following cessation of the herbal preparations, the patient was commenced on oral chelation therapy, iron supplementation and contraception. A 3-week course of oral DMSA (2,3-dimercaptosuccinic acid) was well tolerated; BLL was reduced to 13 µg/dL and haemoglobin increased to 99 g/L. Her symptoms improved over the subsequent 3 months and she remains hopeful about becoming pregnant.

What is the role of traditional medicines in Australia?

Ayurvedic medicine (AM) and traditional Chinese medicine (TCM) have an important role in Australian society and at least two in three Australians report complementary medicine use in a 12-month period.[1] Heavy metal toxicity is a known complication of AM and TCM but is often overlooked in medical assessment. As the number of Australians accessing medicines via the Internet increases, primary care clinicians need to remain vigilant for heavy metal poisoning in patients who use traditional or herbal medicines regularly and present with unexplained anaemia or abdominal symptoms. Identifying the source of exposure is essential in the management of heavy metal poisoning.

Heavy metal poisoning in traditional medicines: is it a problem?

Herbal products used in AM and TCM have increasingly been under scrutiny with regards to their heavy metal content. In 2005, the Therapeutic Goods Administration (TGA) in Australia issued a safety alert regarding heavy metal toxicity from AM.[2] Although reassuring that Australian herbal manufacturers must be licensed by the TGA, it

should be noted that TGA oversight does not extend to imported products for personal use. Consumers may be unaware of the potentially high heavy metal content in imported herbal remedies and the detrimental effects of heavy metal consumption. The complications of heavy metal toxicity often compound the original ailments for which they were administered with resultant increased morbidity for the patient.

Of the regular cases reported worldwide, lead poisoning seems to be the most common form of heavy metal toxicity. Arsenic poisoning, including cutaneous manifestations and haemolytic anaemia, from oral and topical use of AM and TCM has been described.[3–6] Toxic levels of other heavy metals such as cadmium and mercury have also been reported in herbal preparations. In one study, more than one-fifth of Ayurvedic products purchased over the Internet contained detectable levels of lead in excess of acceptable standards of intake.[7]

What is lead poisoning and how does it manifest?

As lead toxicity is an uncommon presentation, diagnosis poses several challenges and a high degree of clinical suspicion is required. Diagnosis can be assisted with a full blood count and blood film showing classic basophilic stippling, and confirmed with an elevated BLL (>0.48 µmol/L or 10 µg/dL). The first task for the clinician is to identify and remove the source of lead exposure. In the past, common sources of lead included lead-containing paint and petrol. Occupational and industrial sources remain potential sources in modern times, as well as fishing sinkers and lead-contaminated soil in children with pica. In more recent years sources of heavy metal toxicity have included herbal medications, including AM and TCM.[8–12]

Lead poisoning often manifests as non-specific signs and symptoms and has multi-system effects. Overt clinical toxicity from lead may not become apparent until BLL exceed 40 µg/dL.[13,14] However, subclinical toxicity in adults with hypertension and renal impairment is known to occur at lead levels below this threshold. The most common presenting symptoms are abdominal pain, constipation, fatigue and cognitive decline. More severe toxicity involves encephalopathy and seizures. Children are especially prone to the effects of lead and may have intellectual and neurodevelopmental disturbance at low lead levels.[14,15] Hence, the American Academy of Pediatrics (AAP) and Centers for Disease Control and Prevention (CDC) recently reduced the lead monitoring threshold to 5 µg/dL.[16]

How is lead poisoning managed?

Management of lead toxicity involves identification and removal of the source of lead, notifying appropriate authorities and, in some cases, reducing body lead burden with chelation therapy. The oral chelation agent of choice, DMSA, may be indicated in symptomatic patients with elevated BLL.[13] Various guidelines recommend treatment BLL thresholds for asymptomatic patients. The duration of therapy is generally 2–3 weeks, but is dependent on BLL trends and clinical improvement. Common side effects of DMSA therapy include gastrointestinal upset, skin rashes, elevated liver transaminases, fever and neutropenia.[17] Trace elemental deficiency may occur with all types of chelation therapy, particularly with iron, zinc and copper removal. In severe toxicity resulting in lead encephalopathy, patients may require hospitalisation and intravenous chelation therapy. In most cases of lead poisoning, expert advice from the Australian Poisons Information centres (13 11 26) or a clinical toxicologist is recommended.

Key points

- Many Ayurvedic and traditional Chinese medicines contain heavy metals (particularly lead, arsenic and mercury) in large quantities that are well above recommended limits.
- Regular use of Ayurvedic and traditional Chinese medicines can lead to heavy metal poisoning; a thorough drug history should be taken, including the use of traditional medicines.
- A blood film showing basophilic stippling remains an important diagnostic tool for lead toxicity.

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