

more pressure on medical schools and postgraduate institutions to give appropriate training. The Brazilian Society of Community and General Doctors is seeking to address this situation and could act as a catalyst, advocate, and pressure group, as well as promoting good quality training, just as the Royal College of General Practitioners has done in this country.

It is difficult to evaluate the effectiveness of the link programme, but we believe it has helped to broaden the perspective of both the British and the Brazilian participants. By providing an outside point of reference for the important work being undertaken by our Brazilian colleagues it has helped to give community based approaches to health care credibility within the country. This is important because there are many interests which may try to stifle attempts to improve health care.

Potentially far reaching changes are occurring in Brazilian society and the health care system has become a focal point for change. If the forces unleashed are sufficient to overcome bureaucratic inertia and corruption they could bring about a transformation which will have even greater impact and importance than the development of the NHS in Britain. If they fail, the rapidly growing populations in the favelas of the great urban centres will become even more desperate in their quest for survival, with incalculable consequences for the stability and future of the country. The potential for large population movements to wreak havoc on environmentally vital regions such as the Amazon basin means that the outcome of the struggle for health and development in Brazil is of international importance.

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## Lesson of the Week

### Arsenic and mercury intoxication due to Indian ethnic remedies

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Ethnic remedies prescribed by hakims may contain toxic amounts of arsenic and mercury

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We have recently seen two cases of heavy metal intoxication resulting from ingestion of Indian ethnic remedies. The substances were dispensed by an Indian ethnic practitioner, or hakim, as a treatment for eczema and were found to contain toxic amounts of inorganic arsenic and mercury.

#### Case 1

A 35 year old Asian man presented with a three month history of progressive weakness of his hands and legs associated with distal sensory disturbance. The patient had first become aware of the symptoms six weeks after a hakim had started treating him for atopic eczema.

On examination Mees' lines were present in the finger nails and there was hyperkeratosis of the soles of the feet. Symmetrical wasting and weakness was present in the upper and lower limbs and all tendon reflexes were absent. Cutaneous sensation was impaired in a glove and stocking distribution. He could not stand from a sitting position without using his arms and walked with difficulty unsupported.

Electromyography suggested a peripheral sensorimotor neuropathy. The presence of a raised urinary concentration of inorganic arsenic (63 µg/l; normal <2 µg/l, toxic concentration >2 µg/l) and a hair arsenic concentration of 20 µg/g on x ray fluorescence spectrometry (normal <1 µg/g) confirmed arsenic intoxication.

Samples of the ethnic remedies obtained from the

hakim were analysed by flameless atomic absorption spectrophotometry and x ray diffraction analysis (table). Packets of the mixed white and orange-brown powder most strongly implicated in this case contained an average of 105 mg of inorganic arsenic trioxide (As<sub>2</sub>O<sub>3</sub>). The patient had been told to take two packets daily.

Chelation therapy with 2,3-dimercapto-1-propan-sulphonic acid (DMPS) 100 mg three times daily for three weeks and later dimercaptosuccinic acid (DMSA) 400 mg three times daily for two weeks was given without objective improvement in muscle strength. Two years after the onset of symptoms the patient was still unable to return to work.

*Composition of Indian ethnic remedies found in the possession of the hakim. The preparation principally responsible for each case of poisoning is indicated in italics*

Description	Main constituent(s)	Average content per preparation* (mg)
Mixed white, orange, and brown powders ( <i>case 1</i> )	Arsenic trioxide Mercuric sulphide ("cinnabar")	105
	Strychnine	0.7
Deep red powder	Arsenic trioxide Mercuric sulphide	90 550
Beige pills	Arsenic trioxide	30
Red-brown pills ( <i>case 2</i> )	Mercuric sulphide	30-42
Brown-black solid	Mercuric chloride Mercurous chloride ("calomel")	34 160

\*In the case of powders "preparation" refers to a quantity of powder contained in a paper package intended to be taken as a single oral dose.

## Case 2

A 32 year old Asian man presented with a three week history of poor appetite, weight loss, diarrhoea, sweating, tremor of the hands, and paraesthesia in the extremities and face. Symptoms developed four weeks after treatment for eczema had been started by the same hakim who had treated the first patient.

On examination the patient was anxious, flushed, tachycardic, and hypertensive, with a fine tremor of the outstretched hands. Neurological examination showed reduced pinprick sensation in both feet. Standard laboratory investigations, including thyroid function tests, all gave normal findings. Mercury poisoning was confirmed by a urinary mercury concentration of 105 µg/l (normal < 10 µg/l, toxic concentration > 100 µg/l) 12 weeks after the last exposure to the ethnic remedies. Analysis of the handmade red-brown pills which the hakim had prescribed at a dose of six daily showed each to contain 30-42 mg of inorganic mercuric sulphide (table).

## Comment

Both our patients presented with symptoms and signs of heavy metal intoxication within six weeks of exposure to remedies administered by the same hakim. The presentation of the first patient with a subacute sensorimotor peripheral neuropathy is typical of intoxication with inorganic arsenic.<sup>1</sup> Peripheral neuropathy after use of arsenic containing ethnic remedies has been reported from India,<sup>2</sup> but is not a recognised health hazard in the United Kingdom. The symptoms in case 2, which included gastrointestinal and autonomic disturbance, closely resembled those reported in past cases of mercury intoxication.<sup>1,3</sup>

Most large towns in Britain with sizable Asian communities have three or four resident hakims, and an unknown number visit Britain from abroad to practise for a few weeks several times a year. The hakim who treated these two patients was a visitor.

Most hakims are medically unqualified and the main conditions they treat are fatigue and depression, digestive disorders, psychosexual problems, and skin conditions.<sup>4</sup> The services of hakims and the products used by them are widely advertised in Asian newspapers in Britain. Some hakims manufacture their own remedies from raw materials bought in India, whereas others obtain commercial preparations directly from manufacturers in India or Pakistan. Many are issued in unlabelled containers.

As illustrated by the first patient, recovery from arsenical neuropathy is generally poor, even after treatment with chelating agents.<sup>5</sup> Prompt removal from the source of toxic exposure is therefore mandatory. Of greater concern is the fact that a single dose of arsenic trioxide of 200-300 mg may be fatal.<sup>6</sup> Since one of the preparations given to the first patient contained up to 187 mg of arsenic trioxide per dose, there is a potential for fatal poisoning. To prevent further cases the Indian community in the United Kingdom should be made aware of the risks associated with the use of ethnic remedies, and their distribution and sale should be monitored.

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## Pituitary imaging is essential for women with moderate hyperprolactinaemia

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All women with hyperprolactinaemia (>1000 mU/l) should be referred for further assessment and computed tomography or magnetic resonance imaging of the pituitary

In patients with a macroadenoma (> 1 cm in diameter) of the pituitary a plasma prolactin concentration of > 4000 mU/l,<sup>1</sup> > 6000 mU/l,<sup>2</sup> or > 8000 mU/l<sup>3</sup> has been reported to be diagnostic of a prolactin secreting adenoma. A plasma prolactin concentration which is raised but is less than this can originate from a small prolactin secreting tumour (microadenoma) or from loss of normal inhibitory control by dopamine, as seen in compression of the pituitary stalk. This secondary hyperprolactinaemia usually indicates the presence of a large pituitary tumour not secreting prolactin or a cyst.

Hartog and Hull stated that computed tomography of the pituitary does not have a role in cases of moderate hyperprolactinaemia<sup>4</sup> because it is of little value in diagnosing a microadenoma.<sup>5</sup> They have, however, overlooked the possibility of moderate hyperprolactinaemia reflecting compression of the pituitary stalk. We assessed the prevalence of large tumours in patients with moderate hyperprolactinaemia.

## Methods

We studied 36 women (mean (SD) age 30.8 (8.2) years) who presented with oligomenorrhoea, amenorrhoea, infertility, or galactorrhoea to an endocrine or infertility clinic over two years and who had a plasma prolactin concentration of 1000-8000 mU/l (normal range 80-460 mU/l). We excluded women with hypothyroidism and with hyperprolactinaemia related to drug treatment. We recorded the patients' presenting symptoms and checked their visual fields with a confrontation test. Computed tomography of the pituitary was performed on all patients, and all the scans were reported by two consultant radiologists by consensus. Contiguous 2 mm coronal (or axial) scans

TABLE 1—Plasma prolactin concentrations and presenting symptoms in 36 patients with hyperprolactinaemia according to appearance of pituitary on computed tomography

Tomographic appearance	Median (range) plasma prolactin (mU/l)	No with symptoms			
		Oligomenorrhoea and amenorrhoea	Galactorrhoea	Headache	Tiredness
Normal (n=12)†	2125 (1100-3900)	10	6		
Microadenoma (n=18)	2447 (1079-4200)	17	6	3	1
Macroadenoma (n=6)	2491 (1003-7180)	5	2	3*	3**

†Includes one report of an empty sella.  
‡Compared with other patients (Fisher's test of exact probability): \*p < 0.05, \*\*p < 0.01.