

work on the evaluation of many traditional remedies. To proceed further, however, evidence is needed to confirm or refute what seems to be common sense, as well as to measure the size of any problem. In Walsall, we are conducting a descriptive study into the use of complementary and traditional therapies by ethnic groups and the reasons for their use. We will be looking particularly at the Asian community, but, given the diversity of available therapies used by this group, the task will not be straightforward. At least a study of this nature may help us to gauge its importance. Who knows, it may even be appropriate for some health authorities to consider purchasing some types of alternative or complementary medicine.

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1 Atherton DJ. Towards the safer use of traditional remedies. *BMJ* 1994;308:673-4. (12 March.)

Remedies may contain cocktail of active drugs

EDITOR,—We wish to add to the information given by David J Atherton about the use of traditional remedies.¹ Exported herbal remedies have been adulterated with synthetic drugs to improve their activity and most likely their popularity in Western countries. We describe a dangerous evolution in the formulation of a Chinese herbal arthritis cure, Chufong Toukuwan, manufactured by Nan Lien Pharmaceutical Company, Hong Kong. Since 1974 the following undeclared drugs, in association with 23 declared herbal drugs, have been detected: aminopyrine, phenylbutazone, indomethacin, hydrochlorothiazide, chlorthalidopoxide, diazepam, and corticosteroids.^{2,5}

Serum urea, creatinine, and cortisol concentrations before treatment with Chufong Toukuwan pills (18 January 1993), one month after treatment (8 and 16 June), and one month after end of treatment (19 July).
*Morning blood sampling.

	18 January	8 June	16 June	19 July
Urea (mmol/l)	8.17	10.50	11.83	8.00
Creatinine (mmol/l)	97.4	106.2	124.8	108.9
Cortisol (mmol/l)*		33.11	33.15	621.55

A 75 year old Belgian woman with gonarthrosis had been treated for five years with sulindac. She had also been treated for hypertension for more than 10 years with hydrochlorothiazide, triamterene, amlodipine, and atenolol. On 5 May 1993 she stopped taking sulindac and took, on her own initiative, Chufong Toukuwan (eight pills daily for one month), which she obtained by mail order. She had good relief of symptoms but began to look cushingoid, as confirmed by a low plasma cortisol concentration (table) and weight gain: administration of exogenous corticosteroid was suspected. Furthermore, the treatment of her hypertension seemed less effective and renal failure was considered. One month after she stopped the treatment her plasma cortisol concentration and renal function had recovered (table).

Analysis identified six synthetic drugs illegally introduced in the plant matrix: each pill contained 0.6 mg of hydrochlorothiazide, 3.2 mg of indomethacin, 6.8 mg of diclofenac, 38 mg of mefenamic acid, 20 µg of dexamethasone, and 0.75 mg of diazepam. Therefore, two added drugs—diclofenac and mefenamic acid—that had never been detected in such preparations were

found. In addition, the recommended dose affords usual doses of each of the three non-steroidal anti-inflammatory drugs and the benzodiazepine.

Use of several non-steroidal anti-inflammatory drugs is well known for its adverse effects (nephrotoxicity, retention of salt and water, gastrointestinal disorders), which are increased by the addition of corticosteroid. Moreover, the use of non-steroidal anti-inflammatory drugs with antihypertensive agents (diuretics or β blocking agents, or both) decreases the efficacy of the hypertensive treatment.

Finally, as licorice, one constituent of the plant matrix, could be considered to be an additional hazard (aggravating the electrolyte imbalances) many unexpected adverse effects may occur.

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Risk of cancer and exposure to power lines

Still no answers

EDITOR,—The Danish¹ and Finnish² studies suffered from similar serious shortcomings to those which have plagued much of the published research on the possible adverse health effects of power-frequency magnetic fields.

Firstly, as part of their objective both studies only considered high voltage (>50 kV and >110 kV) power lines. The effect of this is to greatly reduce the likelihood of any associations being found, because many cases will occur in equally high magnetic fields due to other sources, and the study will not have recorded these as being in a high field. It has been repeatedly shown that magnetic fields from 33 kV down to 415 V distribution lines often give rise to fields in excess of 0.25 µT, and I have recorded 1.5 µT in bedrooms due to 33 kV lines. The effect of this objective alone is to make the results fairly worthless in determining whether there is any link between power-frequency magnetic fields and cancers.

In the Finnish study the authors calculated fields down to 0.01 µT (10 nanotesla). The average magnetic field in British houses, as a result of wiring, is in the order of 0.03-0.06 µT, and street wiring and low voltage distribution wiring often raises this to well in excess of 0.1 µT. I would be surprised if Finnish magnetic fields were significantly lower, and this would completely mask the analysis of their calculated fields.

Secondly, the fields were calculated on the basis of the average flow over a full calendar year. The magnetic field at a distance from a power line is critically dependent on the actual phase current values and power factors, and small changes in current balance cause large changes in the calculated field. Yearly average current flows will not provide this essential level of detail, and so the

calculated values are likely to have margins of error of at least 100% due to this fact alone.

Thirdly, if, as has been suggested, the critical exposure period is night time, when people are resting, then the exposure during winter months will be many times that during the summer months. In the United Kingdom, especially in rural areas, overnight field levels can be three times the day values during winter months due to loads from off-peak storage heating.

Finally, most of the possible mechanisms which have been suggested and shown in cellular experiments as being responsible for biological effects of electromagnetic fields are based on resonance phenomena, which involve both the alternating power-frequency field and the earth's local geomagnetic field. None of the epidemiological studies published to date have collected this essential extra data.

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Authors' reply (Denmark)

EDITOR,—In regard to Alasdair Philips's first point, all inhabitants of industrialised nations are exposed to some extent to magnetic fields in the 50 Hz range, but people who live close to 50-400 kV power lines and substations have prolonged, uniform exposure to field levels clearly above the average. Electricity distribution installations below 50 kV were not included in our study. In Denmark, lines at these levels are either buried or constructed as three phase, symmetrical overhead lines. Therefore, unlike certain other countries (such as the United States) where single phase construction is common, these voltage levels do not in general outweigh domestic exposures. In Danish dwellings distant from high voltage installations the average residential exposure to 50 Hz magnetic fields measured over 24 hours is 0.06 µT. There may, however, be situations where residents are exposed above a 24 hour average of 0.1 µT, which was the lower cut off point used in the study. Therefore, as also discussed in our paper, the risk estimates of the study may be influenced by a considerable degree of misclassification of the exposure variable, which gradually diminishes as higher cut off points are used. Such non-differential misclassification may lead to underestimation of the true risk associated with exposure.

In regard to the second and third points, the Danish electricity supply system does not normally allow stray currents to be generated; the practise of "zeroing" of electric installations is rather unusual, which implies that the local current supply is balanced. Thus, on the basis of data on current flow in a given line, distance between phases, ordering of phases, and distance between the dwelling of the child and the installation it should be a rather simple task to calculate the actual magnetic field strength at the dwelling. The current flow was determined in the form of a yearly "duration" graph for the individual line, supplying us with information on the middle (average), the maximal, the extreme, and the minimal loads on the line during a year. Supplemental analyses, where we used data on the maximal and the minimal loads, did not affect the risk estimates to an extent that would change the results of our study.

In conclusion, in spite of the many shortcomings we face any time we try to reconstruct and evaluate past exposures of study subjects, we believe that the approach to exposure assessment used in our