

LETTER TO THE EDITOR

AN ANALYSIS OF MEDICINES OF UNDISCLOSED COMPOSITION FOR
ASTHMA OR RHEUMATOID ARTHRITIS

Sir,

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Patients suffering from asthma and rheumatoid arthritis are often found taking medicines of undisclosed composition from whatever source available. During the last six years 75 such samples were sent to us by the patients or physicians because of curiosity or impressive results or undesired effects. 36 samples were made available as powders, 14 as pills, 14 as tablets, 7 as capsules containing powder and 4 as liquids. Solid preparations were finely powdered and liquids were used as such for detection of a total of 5 different drugs (Table I) as described below.

TABLE I : Analysis of samples for detection of certain drugs.

<i>Drug sought for</i>	<i>Samples tested</i>	<i>Samples showing presence of drug</i>
Corticosteroids	75	22
Arsenicals	45	4
Ephedrine	37	1
Isoprenaline	37	0
Salicylates	45	1

For detection of corticosteroids 100 mg powder was shaken for about 2 min with 5 ml chloroform and filtered. Liquid preparations (20 ml) were extracted with 10 ml chloroform. Chloroform extraction was repeated once and the two filtrates were pooled and evaporated to dryness on a water bath. 2 ml sulphuric acid (98%, w/w) was added to the dried residue. A green colour changing to bright red within 1 min indicates prednisolone or methyl prednisolone. Prednisolone shows a yellowish green colour which after 1 min becomes yellowish orange. Hydrocortisone and its acetate produce yellowish green fluorescence in day-light, which soon becomes orange-red and finally dark red (1). The minimum detectable quantity is 2-5 mg. We performed this test on

the extract of 7 tablets (3.5 mg) each of betamethasone and dexamethasone; sulphuric acid failed to develop any colour. This explains why Johnson and Thornton-Jones (1) have not mentioned this colour reaction for dexamethasone and betamethasone. To detect these and to confirm presence of remaining steroids chloroform extracts were subjected to thin layer chromatography (TLC). In this work, silica gel G plates were employed which were run in chloroform+ethanol (93+7 volumes) or methylene chloride+ethanol (95+5 volumes) and dried at room temperature (2). They were then sprayed with alkaline tetrazolium blue reagent (3). Spots of standard solutions of the corticosteroids were run alongside, which gave purple or violet spot within 1 min. Prednisone, prednisolone and methyl prednisolone, hydrocortisone, dexamethasone and betamethasone all gave unmistakable spots on TLC. This test can detect 10 μ g quantities of the steroids.

The method described by Stewart and Stolman (4) was followed for detection of arsenic (minimum detectable quantity, 5 μ g). In this method organic arsenic compounds get converted to inorganic arsenic. Samples were also tested for ephedrine and isoprenaline using methods (5, 6) which detect 5 mg of the drugs. Confirmation of ephedrine was carried out by TLC in n-butanol: acetic acid : water (4:1:5) and spraying with 0.2% ninhydrin in n-butanol (w/v); presence of isoprenaline was confirmed by placing the plate in iodine vapour for visualising the spot (minimum detectable quantity, 10 μ g). For detection of salicylate sample was boiled in a water bath with 5% hydrochloric acid, neutralized with 5% sodium hydroxide and cooled. A few drops of 1% ferric chloride solution gave a reddish violet colour in presence of salicylates (minimum detectable quantity, 5 mg). Tannins interfere in this test; their presence was suspected in one powder and hence a more specific TLC method (7) was followed. The results of our work are presented in Table I.

Rf value on chromatograms indicated presence of prednisolone or methyl prednisolone in 19 samples, betamethasone in 2 and hydrocortisone in 1 sample. Temptation to add steroids to secret remedies for asthma or rheumatoid arthritis appears strong because of their easy availability, potency, efficacy and impressive immediate relief. Five of these preparations were sent to us because they produced weight gain, fluid retention and moon face in the patients, which aroused clinicians' suspicion and 3 of them did show presence of corticosteroids. It is possible that after getting the desired therapeutic effect or the undesired side effect, the individuals who were dispensing the remaining 2 powders might have stopped adding steroids and switched to placebo preparations for keeping contact with the patient. One arthritis patient was given 7 powders per day with timing of intake written on each; powder scheduled for 8 A.M. and 6 P.M. contained prednisone while the other 5 were free of steroids. This suggests need of testing separately all the samples dispensed for a particular day.

Inorganic arsenic is added perhaps because of its old reputation as a 'tonic' 'restorative' and anti-infective. Contrary to our expectation, ephedrine was present only in one sample. Isoprenaline tablets were commonly used sublingually for bronchodilation although it could not be detected in any sample. Salicylate was detected in only one sample. It is interesting to note that aspirin induces asthma in susceptible subjects but is known to relieve it in some others (8). Organic mercury preparation and borax are often used by Ayurvedic practitioners. It will be of interest to test samples for these drugs and also for theophylline and salbutamol. Herxheimer & Stressemann (8) found in Germany that proprietary asthma powders available without medical prescription gave clear relief to chronic asthma patients. Out of 53 such preparations 27 contained phenazone, 22 contained amidopyrine and 4 had both. This is interesting and we plan to test Indian secret medicaments for asthma or arthritis for these two drugs also.

Our results show that the popularity of medicines of undisclosed composition some of which contain corticosteroids, is brought with the risk of indiscriminate unauthorised use of steroids creating an iatrogenic public health problem.

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