Results of intravenous tetracosactrin test (500 mg in 500% 5% dextrose) performed when patient was taking dexamethasone 0.5 mg twice daily

Time (hours)	Plasma cortisol concentration (nmol/l)*
0	75
1	346
2	412
3	421
4	470
5	479

*Expected maximum >600 nmol/l.

deficiency. The high cortisol concentration during his first admission suggested that there was no deficiency in production of glucocorticoids, only in mineralocorticoids, although the suboptimal rise during infusion of tetracosactrin indicated some loss of reserve cortisol.

Postmortem studies have shown a high prevalence of adrenal disease in patients with AIDS. In one study of 41 subjects at necropsy 51% had cytomegalovirus adrenalitis. Hyponatraemia was the most common finding (in 75%), although only two subjects had been suspected during life of having adrenal insufficiency.¹ Stimulation with tetracosactrin may indicate impairment of adrenal function despite normal or high cortisol concentrations measured at random.¹⁻³

The cause of the adrenal dysfunction in our case is unknown; the dysfunction would probably have been overlooked if reliance had been placed on the raised cortisol concentration. We suggest that in patients with AIDS with lethargy, hypotension, hyponatraemia, or hyperkalaemia, deficiencies of mineralocorticoids and glucocorticoids should be investigated by measurement of aldosterone concentration and plasma renin

activity; prolonged stimulation with tetracosactrin (intravenously or intramuscularly); and, perhaps, assay of serum adrenocorticotrophic hormone concentration when the serum cortisol concentration is normal or low.

Our findings suggest that some of the morbidity associated with AIDS is a result of mineralocortical deficiency. Adrenal complications caused by HIV are easily treated and should be considered in all patients with infections related to AIDS.

We thank Dr Louise Sugden for measuring plasma renin activity; Mrs Michelle Miller for measuring plasma aldosterone concentration; and Professor A Guz for permission to report this case.

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Assessing glycaemic control in non-insulin dependent diabetes: acceptability of blood sampling at home

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Measurement of glycosylated haemoglobin concentration is an accurate and convenient method of assessing overall glycaemic control in diabetes but is expensive and labour intensive.¹ In non-insulin dependent diabetes fasting blood glucose concentration correlates well with glycosylated haemoglobin concentration and is much cheaper to measure.² In our hospital patients are therefore asked to have their fasting blood glucose concentration estimated before their visit to the clinic. This requires patients to make a visit to the laboratory while fasting.

We studied the acceptability and relative costs of three methods of obtaining samples for measuring fasting glucose concentration: by venepuncture in the laboratory and by finger pricking at home to produce blood spots on filter paper and reagent strips (BM 1-44; Boehringer Mannheim). Blood spots on filter paper have been used in previous studies,^{3,4} but their acceptability to patients is not known.

Patients, methods, and results

Sixty eight non-insulin dependent diabetics who did not regularly monitor their blood glucose concentrations at home agreed to produce blood spots and use reagent strips at home after fasting. All received oral and written instructions on performing the tests from one investigator. Samples were enclosed in plastic bags and returned in envelopes to the laboratory.

We analysed blood spots, which are stable at room temperature for eight days, by the method described by Gamlen *et al.*⁵ The results correlated well with venous blood glucose concentrations measured with a Yellow Springs analyser ($r=0.977$; $p<0.001$; $n=56$). Values obtained with reagent strips read with a

reflectance meter at the time of sampling ($r=0.909$; $p<0.001$; $n=45$) and after postal delivery to the clinic ($r=0.900$; $p<0.001$; $n=45$) also correlated well with venous concentrations.

Fifty patients returned both blood tests, and one patient returned only the blood spot. There were no significant differences in age, sex, or duration of diabetes between respondents and non-respondents. Four of the 10 patients who had used reagent strips before produced inadequate strips (Fisher's exact test $p=0.043$), although all produced adequate blood spots. Patients with no experience of finger pricking produced significantly better spots than strips (table).

Adequacy of reagent strips and blood spots on filter paper produced by 40 patients with no experience of finger pricking*

Reagent strips	Spots		
	Adequate	Inadequate	Total
Adequate	14		14
Inadequate	18	8	26
Total	32	8	40

McNemar's test statistic (with Yates's correction)=16.05, $p<0.0005$.

*Reagent strips were considered inadequate if blood was smeared or did not cover the whole colour block, or if they could not be read by a reflectance meter. Filter paper spots were considered inadequate if blood had not soaked through the filter paper to a diameter of 6 mm.

Patients who produced adequate strips were on average younger (mean (SD) age 57.4 (14.1) years) than those who produced inadequate strips (65.6 (9.2)) ($p=0.033$). This was also true for spots (61.3 (12.4) v 67.3 (7.2) years, $p=0.033$).

Fifty one patients, 47 of whom had returned samples, later returned a questionnaire. Eighteen found visits for laboratory sampling inconvenient. Of the 45 who stated preferences, 31 preferred home sampling to venepuncture at the laboratory or the general practitioner's surgery. Preference was not significantly related to age, sex, or duration of diabetes.

With information from the questionnaire and the laboratory we estimated costs of materials and technicians' time and costs to patients of the three methods of sampling; blood spots had to be posted to the laboratory, whereas patients took reagent strips to the clinic to be read by a reflectance meter. Sampling at the hospital was most expensive for both the NHS

(68p) and the patient (80p). The two home tests were of comparable cost to the NHS (49p for blood spots, 45p for strips). Costs of materials for all three methods were similar (20p). Blood spots cost the patient 19p in postage, but strips brought to the clinic did not cost the patient anything.

Comment

The results show a strong preference for home testing, although most patients had no experience of finger pricking. Many patients found the visit to the laboratory after fasting inconvenient. Patients produced significantly better blood spots than reagent strips, probably because it requires more practice to produce satisfactory strips.

We conclude that patients find producing blood spots on filter paper or reagent strips at home and sending them by post before clinical review to be

an attractive method of measuring fasting glucose concentration and cheaper than attending a laboratory.

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Waldenström's macroglobulinaemia: three cases in shoe repairers

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Waldenström's macroglobulinaemia is an uncommon, low grade lymphoproliferative malignancy of the elderly characterised by infiltration of the bone marrow by plasmacytoid lymphocytes and high serum concentrations of IgM paraprotein, causing hyperviscosity. Its cause is unknown, and no risk factors for its development have been described. We were surprised to find that, of six patients with Waldenström's macroglobulinaemia, three had worked for long periods as shoe repairers.

Case histories

The three patients were men aged 64, 57, and 83 respectively at presentation. All fulfilled the diagnostic criteria for Waldenström's macroglobulinaemia—that is, they had extensive infiltration of the bone marrow and a high plasma monoclonal IgM κ concentration (table). All three developed mucosal bleeding, and in cases 1 and 2 the abnormalities of coagulation were consistent with those in von Willebrand's disease, which is a rare complication of paraproteinaemia. Coagulation returned to normal after treatment with cyclophosphamide.

All three patients had worked for more than 40 years in family shoe repairing businesses and had been exposed to leather, rubber adhesives, dyes, and paints. None of them had taken any specific protective precautions, though modern finishing machines contain extractor fans, and they had not monitored dust and solvent levels. Furthermore, two of them had lived

above their shops, and one stated that when the fumes in the shop became excessive the door leading to the living quarters was opened to clear the air.

Comment

Our patients were exposed to leather and rubber dust when cutting and buffing soles and heels, which were previously made from natural rubber and are now made from synthetic, vulcanised styrene-butadiene rubber. Before the second world war the adhesive used in shoe repairing was natural rubber solution, consisting of natural rubber dissolved in petroleum naphthas such as benzene, alkylbenzenes, and paraffins. Cellulose cement softened with amyl acetate was also used. Synthetic rubber cements consisting of polychloroprene (Neoprene) or polyurethane dissolved in organic solvents have been used since the 1950s. Shoe dyes were often alcohol based—for example, nigrosine black.

In 1985 Waldenström's macroglobulinaemia was mentioned in 117 death certificates in England and Wales (population 49.9 million),¹ giving a potential death rate of 1/430 000 a year. In the year 1984-5 the Leukaemia Research Fund's centre for clinical epidemiology registered 98 new cases (59 men and 39 women) from a population base of 20 million, giving an incidence of about 1/200 000 a year (R A Cartwright, personal communication). The 10% sample of the 1981 census recorded 530 shoe repairers in Great Britain (Office of Population Censuses and Surveys, unpublished data), of whom 106 were in the 55-64 age group. Thus the number of elderly and retired shoe repairers in the catchment population of 300 000 from which our three patients came would be unlikely to be more than 20. Thus the observed incidence of Waldenström's macroglobulinaemia among shoe repairers in the Sheffield area is many times greater than expected.

Because the calculated death rate from Waldenström's macroglobulinaemia is of the same order of

Details of three shoe repairers with Waldenström's macroglobulinaemia

Case No	Serum IgM (g/l)*	Kaolin cephalin clotting time (seconds)		Factor VIII (coagulant activity) (IU/l)†	Factor VIII (ristocetin cofactor) (IU/l)†	Factor VIII (von Willebrand factor) (IU/l)†
		In patient	Control value			
1	54	56	41	350	400	180
2	55	55	39	370	160	190
3	54	41	39	NA	NA	NA

*Normal range=0.5-2.0 g/l.

†Normal range for all three VIII components=500-1500 IU/l.

NA=Not available.