MEDICAL PRACTICE

*Clinical Topics***Disposable syringes for insulin injection**

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British Medical Journal, 1979, 1, 1467-1468**Summary and conclusions**

Results of a questionnaire on use of glass syringes among diabetic patients showed considerable variation in methods of keeping the syringes and in the duration of their useful life. Thirty patients took part in an investigation in which each patient used the same disposable syringe in place of the glass syringe for up to two months. No clinical or bacteriological evidence of infection was found.

Used in this way, disposable syringes were less expensive than glass syringes. They are lighter than glass syringes, less susceptible to damage, and more easily carried on journeys.

Introduction

Most diabetics use glass syringes for injecting insulin but this routine is unsatisfactory both from the patient's view and in the national interest. Glass syringes cost £2.16 and they break easily. Patients are advised to keep more than one syringe.

Results of a survey of patients attending our diabetic clinic showed that the average life of a glass syringe was about three months. This is not the only expense. Patients are advised to keep the syringe with needle attached in a spirit-proof case half filled with industrial methylated spirit. This is a messy procedure, particularly when travelling or on holiday. The spirit evaporates quickly and must be replaced often when it becomes cloudy or contaminated. When the syringe is taken out of spirit care must

be taken to ensure that the spirit has evaporated entirely before insulin can be drawn into the syringe, a time-wasting manoeuvre not appreciated by the busy person anxious to get on with the day's work. Not all diabetics adopt the routine; results of one study showed that 66% of patients did not usually sterilise their syringes in the recommended way.¹ Results of a questionnaire answered by 60 diabetics attending our clinic showed that 40% of patients kept their syringe dry without recourse to spirit and without overt disadvantage, and indeed other trials have shown that immersion in spirit may be deleterious.² Most patients in this study boiled their syringe from time to time—daily (18%), weekly (27%), monthly (16%), or about every three months (20%). Some (18%) never boiled their syringe at all. Most patients swabbed both the top of the insulin bottle and the skin with spirit before injection, but 5% swabbed neither; certain authorities claim swabbing is not necessary at all.³⁻⁷

Despite all these precautions or lack of precautions, local infections at the site of injection are rare in diabetics, even in those with whom ordinary cleanliness is not a feature. Disposable syringes are made of a polypropylene called SAN with plungers of polystyrene. They are sterilised in their packets either by gamma rays or by ethylene oxide gas. They are lighter than glass syringes, less susceptible to damage, and more easily carried about. Several varieties are available, all clearly marked in conformity with British Standard 1619, showing 20 marks per millilitre. The average cost is 4.5p for a 1-ml syringe (5.9p with needle) and 2.5p for a 2-ml syringe (3.8p with needle) (table I).

TABLE I—Types of disposable syringe and cost

Syringe		Cost with needle (in pence)
1 ml	Gillette Surgical	6.7
	Becton Dickinson	6.7
	Needle Ind (Steriseal)	5.9
	Sherwood Ind (Brunswick)	4.5
2 ml	Gillette Surgical	4.55
	Becton Dickinson	4.55
	Brunswick	2.3
	Steriseal	4.3

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The 2-ml syringe is cheaper than the 1-ml syringe because demand is greater and manufacture easier. These disposable syringes will not stand boiling or immersion in spirit, which either degrades the syringe or plunger or dissolves the markings. The instructions on the container packet clearly state that the syringe must be discarded after being used once. Nevertheless, since we found that some patients were using the same disposable syringe and needle many times without ill effect, we decided to study in more detail whether this was a safe practice.

Patients and methods

Thirty patients with diabetes, who had previously been using glass syringes, were asked to take part in a trial of disposable syringes and needles and willingly agreed to do so. Each patient agreed to use the same syringe, some injecting twice a day, for separate periods of up to eight weeks. After each injection the syringe and attached needle was simply replaced in the packet and put in the fridge with the insulin bottle. If the needle became blunt after three to four days it was replaced by another disposable needle. At the end of the period specified at the start the syringe and last-used needle were brought to the clinic with some insulin drawn up in the syringe. Samples were taken from the sites of injection and hands using premoistened swabs, which were then cultured on blood agar plates. The insulin from the syringe was cultured on blood agar and inoculated into Robertson's cooked-meat medium, and this was subcultured on to blood agar the following day. All plates were examined after 24 hours' incubation at 37°C. Patients were seen weekly during the trial and were questioned at each visit about redness or soreness at the site of injection and whether the plastic syringe caused any difficulties.

Results

The 30 patients who took part in the trial used 76 syringes in all, of which 60 were submitted for culture. The minimum duration of use for one syringe was one week, the maximum two months (table II).

TABLE II—Duration of use of disposable syringes in 30 patients

No of weeks	1	2	3	4	5	8
No of syringes used	35	16	10	13	1	1

Swabs from injection sites and from the hands were taken on 45 occasions and at least once from each such site in every patient. Of the 60 syringes cultured, 59 yielded no pathogens. One syringe, which had been in use for a month, yielded *Staphylococcus albus*, which was also present in the cultures from hands and abdomen in this patient.^{8 9 10} Skin swabs from all patients grew normal skin flora in varying amounts, mainly *Staph epidermis* and diphtheroids. Occasionally coliforms, *Staph aureus*, and aerobic spore-bearing bacilli were isolated.

Throughout the trial no patient complained of soreness, redness, or tenderness at the site of injection and no local inflammation was seen on inspection.

Discussion

Under the conditions of this trial it seems both practical and safe to use disposable syringes and needles for more than one injection and throwing away syringe and needle after a single injection seems unnecessarily wasteful. Simply by putting the syringe back in its packet after use and then leaving the packet in the fridge patients could use the same syringe for up to two months (the maximum period under trial) without harm. The advantages to the patient were considerable. Disposable syringes are lighter, not apt to break, do not need boiling or keeping in spirit containers, and are easier to take on holiday. Introducing disposable syringes would allow considerable national saving. About 80 000 diabetics in Britain need daily insulin injections and since in our survey the average life of a glass syringe costing

£2.16 was about three months, the estimated yearly cost of glass syringes is about £8-10 per person. If disposable syringes were each used for a fortnight the annual cost might be less than £1 per head.

The container for the plastic diabetic syringe carries the caption "Sterile. Destroy after single use," no doubt because sterility cannot be guaranteed once the syringe has been removed from the packet and because the syringe might be used by more than one person, with the risk of syringe-transmitted hepatitis.¹¹⁻¹⁴ These risks apply equally to the glass syringes that are currently supplied to diabetic patients. It would be more appropriate to reword the present caption to read: "Sterile before opening," which would not inhibit patients from using the same syringe and needle more than once.

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A 60-year-old patient has suffered for the past eight months from complete loss of taste (hypogeusia) together with excessively salty salivation. Extensive investigation has shown no cause. What might be the cause, and how should the patient be treated?

Any foreign body, such as dentures, leads to an increased flow of saliva. This effect usually diminishes with time but it may remain persistent. Little can be done. A salty taste is said to be characteristic of discharge from an oral cyst¹ but probably more often represents a distortion of taste sensation. Loss of taste is often problematical. There is some impairment of taste with advancing years but not usually enough to cause complaint. The process is made worse by smoking. The question suggests that local disease in the oral cavity has been excluded and the patient is not receiving radiotherapy, which may cause loss of taste. Lesions of the chorda tympani may cause unilateral loss of taste in the anterior two-thirds of the tongue. This may follow stapedectomy, Bell's palsy, or an acoustic neuroma. The associated neurological signs should make the diagnosis obvious. Temporal lobe epilepsy may present with unpleasant sensations of taste but the illness is then episodic and not continuous. Disorders of taste associated with cerebral tumours are extremely rare.

Many drugs, such as clofibrate, lincomycin, carbimazole, lithium carbonate, phenindione, metronidazole, penicillamine, griseofulvin, and imipramine, affect the sense of taste, which does not always return quickly when the drug is withdrawn. Loss of taste has been described in hypothyroidism and thyroid function should be checked. It may also be a feature of depressive illness and of some obsessional states. It is then hard to tell which comes first, the disturbance of taste or the psychiatric upset. It is also important to ensure that the patient is not malingering in pursuit of compensation after head injury. When all likely causes have been excluded and the diagnosis is apparently one of idiopathic hypogeusia it is always worth trying treatment with zinc sulphate thrice daily.²

¹ Tyldesley, W R, *British Dental Journal*, 1974, **136**, 68.

² Henkin, R I, et al, *Journal of the American Medical Association*, 1971, **217**, 434.