

# Hot water bottles and diabetic patients — a cautionary tale

Rajive Mathew Jose, Ramesh Vidyadharan, Deb Kumar Roy and Matt Erdmann

## INTRODUCTION

Diabetic patients with peripheral neuropathy are advised by their neurologist or GP to be cautious while handling sharp and hot objects, as they are prone to accidental burns to their insensate body parts. About three-quarters of thermal injuries result from the victim's own actions.<sup>1</sup> However, many of these patients use hot water bottles in winter to warm their feet. Prolonged contact with these bottles can lead to severe thermal injuries, and we recently encountered two such patients over a span of 3 days who sustained deep burns to their feet, which required hospitalisation. Doctors treating diabetic patients with peripheral neuropathy need to advise patients about this practice.

## CASE HISTORY

The first patient was a 55-year-old man with non-insulin-dependent diabetes mellitus, who was taking metformin and rosiglitazone. He also had peripheral neuropathy of both feet. He had been advised about foot care by his GP but had not been warned about contact with hot objects. He used a hot water bottle to warm his feet and slept with the

bottle under his left foot. He woke up one morning and noticed burns on the lateral aspect of the foot. He did not seek any medical help and chose to dress the burn himself. After 2 weeks he noticed a foul smelling discharge from the wound and went to the Accident and Emergency (A&E) department. He was subsequently referred to our hospital department of plastic surgery. On examination he had a large burn on the lateral aspect of the left foot with a thick leathery eschar, which was starting to separate. There was also purulent discharge from the wound, as well as surrounding erythema (Figure 1). He was treated with antibiotics and dressings and was taken to the operating theatre after a few days for debridement of the burn and split skin grafting. The graft was inspected after 5 days and was found to have taken well.

The second patient was a 57-year-old man with non-insulin-dependent diabetes mellitus, who was taking metformin and rosiglitazone and who also had peripheral neuropathy to both feet. He stated that he had not received any specific advice about avoiding accidental injuries to insensate body parts. He used a hot water bottle filled with water from a kettle for warming his feet. He had slept with the bottle between his feet and woke up one morning to notice burns over both feet. He went to the nearest A&E department and was referred to our unit subsequently.

On examination he had burns over the lateral aspect of his left foot and the medial aspect of his

Figure 1. Case 1 had a large burn on the lateral aspect of the left foot with a thick leathery eschar, purulent discharge from the wound and surrounding erythema.



R M Jose, MS, MCh, FRCS, senior house officer;  
R Vidyadharan, MS, MCh, FRCS, senior house officer,  
D K Roy, MBBS, senior house officer; M Erdmann, FRCS,  
FRCS(Plast), consultant in plastic surgery, Department of  
Plastic Surgery, University Hospital of North Durham,  
Durham.

### Address for correspondence

Mr Rajive Mathew Jose, 25 Knightsbridge Court, Gosforth,  
Newcastle upon Tyne NE3 2JW.  
E-mail: rajivemathew@doctors.org.uk

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right foot, totalling 1% of his body surface area. Half of this area consisted of full thickness burns (Figure 2). In view of the difficulty of securing a graft and the small area of burns it was decided to treat it conservatively with dressings. The patient is currently under review.

## DISCUSSION

The key variables in thermal damage to tissues are the temperature of the source and the contact time. Feldman *et al* have calculated the immersion time required to sustain full thickness burns in children.<sup>1</sup> A temperature of 120°C can produce full thickness skin damage in 10 minutes. Hot water bottles are used by many people in winter and are generally considered safe, but they can produce severe thermal damage with prolonged contact, as exemplified by the above cases.

There are several other similar cases reported in literature. Thng *et al* reported on five patients with similar burns to their feet.<sup>2</sup> Ovesen *et al* reported on two diabetic patients with deep burns to their feet resulting from foot spas,<sup>3</sup> and Balakrishnan *et al* reported two similar cases following therapeutic foot baths.<sup>4</sup> Burn injuries in diabetic patients are generally associated with a worse outcome;<sup>5</sup> they are prone to wound infections, graft failures and prolonged wound healing.

The key to understanding problems of this kind is the concept of 'patient judgement', which results from the complex interaction of a variety of individual variables.<sup>6</sup> In this instance the patients presumed that hot water bottles were safe and were ignorant of the fact that prolonged contact can produce burns even at a low temperature. This underscores the need for better patient education. Prevention being better than cure, doctors treating diabetic patients need to be aware of this problem and should take steps to educate patients about it.

## Consent

Consent was obtained from both patients in this report.

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Figure 2. Case 2 had burns over the lateral aspect of the left foot and the medial aspect of the right foot.