

Footwear dermatitis in Sri Lanka[†]

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Introduction

Contact dermatitis is an eczematous reaction resulting from the interaction of an external substance with the skin. Contact dermatitis to foot wear is a common problem worldwide and it is low in temperate climates and higher in tropical climates¹. Footwear dermatitis is an extremely common problem in Sri Lanka. As humidity and poor working conditions increase the tendency for foot wear dermatitis, it is common among certain categories of workers like farmers and gardeners, in Sri Lanka.

The hot, humid environment within a shoe, combined with the chemicals used in its manufacture creates an ideal situation for the development of allergic or even irritant contact dermatitis². Constituents of rubber, leather, glues, more rarely dyes or impregnated linings used in shoe manufacturing are the most common causes of allergic footwear dermatitis². In many cases the exact nature of the allergen remains unknown. Well known allergens in footwear dermatitis includes mercapto benzothiosol (MBT) and Thiuram in rubber allergy, chromate and formaldehyde used as tanning agents in leather. Certain adhesives and dyes used in shoe manufacturing are also known to produce allergic contact dermatitis².

The pattern of dermatitis on the foot of a person allergic to footwear constituents mimics the location of the offending chemical in the footwear. When the sensitizer is present in the uppers, it involves the dorsa of the feet (fig 1) and in the sole of the shoe, it involves the sole of the foot².

The shoe dermatitis most often starts over the dorsal surface of the big toes and spreads to the dorsa of the feet and other toes. The interdigital spaces are normally spared in shoe dermatitis² in contrast to slipper dermatitis. The heel may be affected, but less frequently than the toes. Indian sandal dermatitis has a characteristic pattern. It is often severe and affects mainly the first toe web and adjacent toes and the dorsum of the foot². Footwear dermatitis is usually bilateral. But the diagnostic difficulty arises when the

dermatitis is patchy, unilateral, superimposed on a preexisting eczema or when it spreads to areas that are not in direct contact with the offending shoe parts³.

A new type of footwear (fig 2) in the Sri Lankan shoe market, mainly contains synthetic rubber and includes other chemicals including ethynyl vinyl acetate (EVA) as filling agent, di coumaryl peroxide as vulcanizing agent and certain dyes. This also contain very small amount of natural rubber. This type of footwear is called EVA by the manufacturers.



Figure 1. Footwear dermatitis on the dorsa of the feet.



Figure 2. New EVA sandals causing foot dermatitis.

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The objective of the study was to analyse the incidence and pattern of contact dermatitis to footwear among patients seeking treatment from Dermatology unit at the Teaching Hospital, Galle.

Method

All patients seen in Dermatology unit during the period from October 99 to March 2001 with the classical clinical features of contact dermatitis to footwear were included in the study. The pattern of contact dermatitis in relation to footwear was noted. Standard patch tests were performed whenever possible.

Results and discussion

There were total of 20970 patients seen at the dermatology clinic during this period. 1462 patients (6.97%) had contact dermatitis to all causes. Out of these 803 (55%) had contact dermatitis to footwear. Of these contact dermatitis was detected to rubber chemicals in 480 (59.8%) and to EVA in 280 (26%) patients. Only 84 (10.4%) had contact dermatitis to leather.

Table 1.

	Ragunathan Sri Lanka	Freeman ² U.S. (1997)	Cockayne, SE ³ UK (1998)
No of patients	803	55	86
Rubber	59.8 %	43.1%	47.6%
Leather	10.4%	23.6%	24.6%
EVA	26%		
Others	3.8%		
Adhesive		20%	

The higher percentage for rubber contact dermatitis in Galle may be since we in Sri Lanka, use more rubber slippers compared to other countries. Low figures comparatively for leather in this series probably indicates less frequent use of leather shoes due to their cost. We were not able to find any references regarding EVA shoes to compare with our data.

There were 35 patients in their first decade and more than 50% of patients belonged to 11-30 years of age. People of all ages may develop shoe allergy. Virtually all reports have included children in the first decade of life and adults as seen in our figures. Our oldest patient was 74 yrs old and youngest was 1 ½ years old.

From the total of 803, 261 (33%) were males and 542 (67%) were females giving a male: female ratio of 1:2. Many other reported series globally too observed a female preponderance though not as marked as in our series.

We have performed standard patch test only in 50 patients due to practical difficulties. Out of 50, 20 patients had positive results for rubber constituent. 7 had positive results for chromate and 2 positive for formaldehyde found in leather. 2 was positive for IPPD which is an antidegradent in natural and chloroprene rubber. 3 positives were seen with epoxy resin in adhesives. 16 patients had negative results as expected. This has been the observation by some other authors too³⁻⁴.

Rubber slipper dermatitis is the commonest form of shoe allergy in Sri Lanka. It is similar to Indian sandal dermatitis and has a characteristic pattern. It affects mainly the first toe web and adjacent toes, and the dorsum of the foot. Newer footwear (EVA) caused to 26% of all footwear dermatitis and is a much larger burden when compared to leather in our study. Standard patch test in some of these patients showed they were allergic to rubber constituent like MBT and thiuram, epoxy resin and IPPD. One patient developed a strong reaction to formaldehyde resins used as an antioxidant in plastics and in adhesives. Shoe dermatitis is often secondarily infected and may produce an id reaction or autosensitization². Id reaction was observed in about quarter of our patients though some authors have noted this in over half of their patients. Fair amount of our patients presented with hand involvement. Leucoderma was seen as late (fig 3) sequelae and is usually due to phenol used in rubber⁵.



Figure 3. Leucoderm as a sequelae to footwear dermatitis.

All the patients were treated for existing dermatitis in the usual way. Once the source of allergy in footwear is identified, they were advised to avoid contact with offending footwear as well as any footwear made up of similar material.

Conclusion

Contact Dermatitis among footwear users is a growing problem in Sri Lanka. This is more severe among rubber slipper users.

References

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