INDIAN J DERMATOL VENEREOL LEPROL 1985 ; 51 : 202-204

SURVEY OF THE DERMATOLOGIC PROBLEMS OF WORKERS IN A SILK FACTORY

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A survey of 106 workers (96 females and 10 males) in a silk factory near Bangalore (Karnataka) revealed a very high incidence of ichthyosis (58.4%), and palmar (61.3%) and plantar (78.3%) keratoderma. Both these genetic disorders were almost equally prevalent in different sections of the silk factory and thus were considered not to be related to the occupational work. However, maceration of the hands, palmar pitted keratolysis and dermatophytic infection of the hands were seen only in the boiling and reeling section where the workers have to immerse their hands in an alkaline water throughout their duty hours. Candidial paronychia and contact dermatitis were not seen.

Key words : Silk, Workers, Survey, Ichthyosis, Keratoderma, Pitted keratolysis.

A colleague investigating the cause of asthma in the workers employed in a silk factory (filature) near Bangalore (Karnataka) noticed occurrence of some skin diseases in these workers. A survey was therefore arranged to investigate the dermatoses in these workers.

Materials and Methods

This filature, situated approximately 40 Km from Bangalore prepares silk from cocoons. The cocoons are received from the surrounding villages and sorted out by hand in the cocoon-sorting section. This section employs only women. The cocoons are then boiled for 3 minutes in small basins containing water which is heated by steam. The boiled cocoons are then floated in trays containing water heated to 40°C and the threads are rolled over the reels. The boiling and reeling section also employs only females who have to dip their hands in water almost throughout the 8 hours of their duty time. The reeled thread is then transferred to the skeining section where the reeled threads are rubbed between fingers to soften the threads. This section also employs only women. Finally, it is transferred to the weaving section where the silk thread is woven into cloth. This section employs only men.

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Throughout this process, no chemicals are added. The processes in the cocoon-sorting, skeining and weaving sections are dry, and the only contactant is the cocoons, or the silk thread. In the boiling and reeling section however, the workers have to immerse their hands in water kept at 40°C. In addition, the gum from the cocoons gets dissolved in this water.

During this survey, all the workers were examined for any disease related to their occupation.

Results

This filature employed 106 workers, 96 females and 10 males. Sixteen females worked in the cocoon-sorting section, 70 females in the boiling and reeling section, and 10 females in the skeining section. All the 10 males worked in the weaving section. The dermatological diseases recorded in these workers are shown in table I.

These workers seemed to have three major diseases. (1) Ichthyosis seen in approximately 60% of the workers, involved both sexes equally. The scaling was generally mild, but it was most prominent on the legs (Fig. 1). The face was not involved. There was no erythema or atrophy of the skin. (2) Hyperkeratosis of the soles was seen in nearly 80% of the individuals,

Table I. Prevalence of various dermatologic manifestations in different sections.

Section	Total number of workers	Number (percentage) of workers having				
		Ichthyosis	Hykerkeratosis		Dermatophytosis of the hand	Pitted keratolysis
			Palmar	Plantar		
Cocoon-sorting	16	10(62.5)	13(81.3)	16(100)	2(12.5)	—
Boiling and reeling	70	40(57.1)	43(61.4)	51(72.9)	21(30)	27(38.6)
Skeining	10	6(60)	6(60)	9(90)	—	—
Weaving	10	6(60)	30)	7(70)	—	—
Total	106	62(58.4)	65(61.3)	83(78.3)	23(21.7)	27(25.4)

Fig. 1. Ichthyosiform scaling on the leg.

some of whom had extreme forms (Fig. 2). It involved the entire sole though the arch was generally less involved. In extreme forms, the soles showed a characteristic cribriform pattern. Palms were similarly involved in approximately 60% of the cases. Most of the workers employed in the boiling and reeling section complained of maceration of their hands which would be worse at the end of the day, and improve during the night. (3) Pitted keratolysis of the palms (Fig. 3) was seen only among the workers in the boiling and reeling section.

In addition, 21 (30%) workers in the boiling and reeling section, and 2 (12.5%) workers in the cocoon-sorting section had dermatophytic infection of the palms.

There were no cases of candidial paronychia or contact dermatitis.

Comments

The workers in this filature seem to have a very high incidence of two hereditary diseases,

Fig. 2. Hyperkeratosis of the soles.

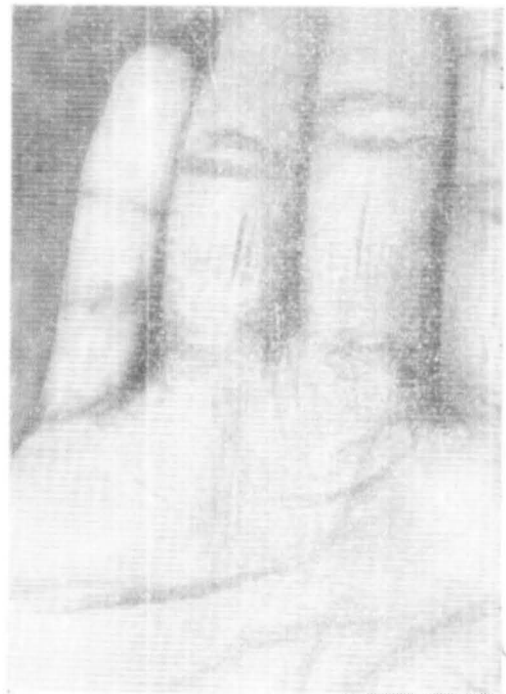

Fig. 3. Pitted keratolysis of the palm.

namely ichthyosis and palmo-plantar keratoderma. The ichthyosis is by and large mild because this region, unlike north India, does not have a severe winter. It was difficult to determine the type of ichthyosis because of the mild nature of the disease and lack of family history, but it seems to be probably autosomal dominant type. These workers frequently marry their close relatives and thus propagate even their abnormal genes. Plantar keratoderma was more frequent than palmar keratoderma, because all these workers walk bare-foot, in addition to the genetic predisposition. Both these diseases were obviously not related to the occupational work, because the rate of prevalence was almost the same in all the sections.

Palmar maceration, pitted keratolysis and most cases of dermatophytic infection, were seen exclusively in the boiling and reeling section and were dependant on the prolonged immersion of hands in water. The pH of this water in the cocoon-trays was found to be alkaline (8.3) which would further help in soaking and swelling of the thickened stratum corneum. Pitted keratolysis has been observed only infrequently in north India, but reported to be common in Kerala[1] where feet were recorded to be involved. Palmar pitted keratolysis seems to be related to the soaking of the hands of the workers, because it was not found in workers in other sections and also not on their feet.

Interestingly, chronic paronychia was not found in any worker in spite of the prolonged immersion of their hands in alkaline water.

References

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