

## Dermatosis from resorcinal in tyre makers

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Resorcinal is a diphenol that causes a dehydrating, keratolytic, irritant, and sensitising action on the skin.<sup>1,2</sup> The present note describes the skin pathology caused by resorcinal in tyre makers.

### Productive cycle

In the plant examined about 5000 motor cycle tyres are produced a day by 268 workers organised in production groups and in three continuous daily shifts.

The tyres are made on a fixed metallic drum of cylindrical shape with bevelled off edges on which the rubber fabrics, of different numbers and types depending on the product to be made, are placed. After the apposition of the fabrics, the edges are folded towards the inside of the drum, both manually and semi-automatically. After this, suitable reinforced metallic rings are opposed to the side of the drum and the thread band is positioned and fixed. The semifinished fabrics used in this procedure are supplied in rolls mounted on a distribution turret whereas the thread bands are supplied on trolleys "in book form." The worker places the fabrics on the drum and guides their winding and positioning with the palm of his hand. The finished product is taken off the drum and sent for further processing.<sup>3</sup>

### Methodology

Forty two workers from the motor cycle section in the factory in the province of Messina were examined. They were chosen by self selection or by the health control office, or both. Details of the group are shown in the table.

The following examinations were carried out:

- (a) Dermatological history.
- (b) Work history, with particular attention to work with exposure to allergens.
- (c) Medical examination.
- (d) Specialist dermatological examination.
- (e) Skin tests, using those proposed by the International Contact Dermatitis Research Group, and some prepared in Vaseline oil from substances issued

directly from the factory. The tests, carried out during a period of absence from work, were read at 48 and 72 hours.

### Results

All the group showed areas of rusty red pigmentation of various colour intensities and dimensions, mainly in the thenar and hypothenar eminences, on the pulps of all the fingers, and in some cases on the flexor surface of the fingers and on the palms of both hands (figs 1-3). A slight sensation of burning and sometimes a slight itch was present in half the subjects; in some cases the lesions were accompanied by a thin layer of desquamation. A clinical diagnosis of pigmentary dermatosis with a slight irritant component, probably due to an external cause was made.

Only eight subjects (19%) reported skin or allergic pathology, or both; but all had used a "new compound" recently. The environment was characterised by a high atmospheric temperature (27°C on average) accompanied by high humidity (60%) and the workers reported a notable increase in perspiration. Chemical analysis of the compounds used showed an increase in the use of resorcinal; the remaining components were the same as those present in previously used compounds. The stop start test carried out on the first group of 10 subjects showed a resolution of the pathology after about one week and the re-appearance after starting to work in the section once more. The modification of the compound with the use of resorcinal already mixed in the polymers resulted in a reduced incidence of the phenomenon. The ergonomic study of the working positions in the section confirmed that the phenomenon was related to work; in fact, the localisation of lesions was characteristic both of the

### Study population

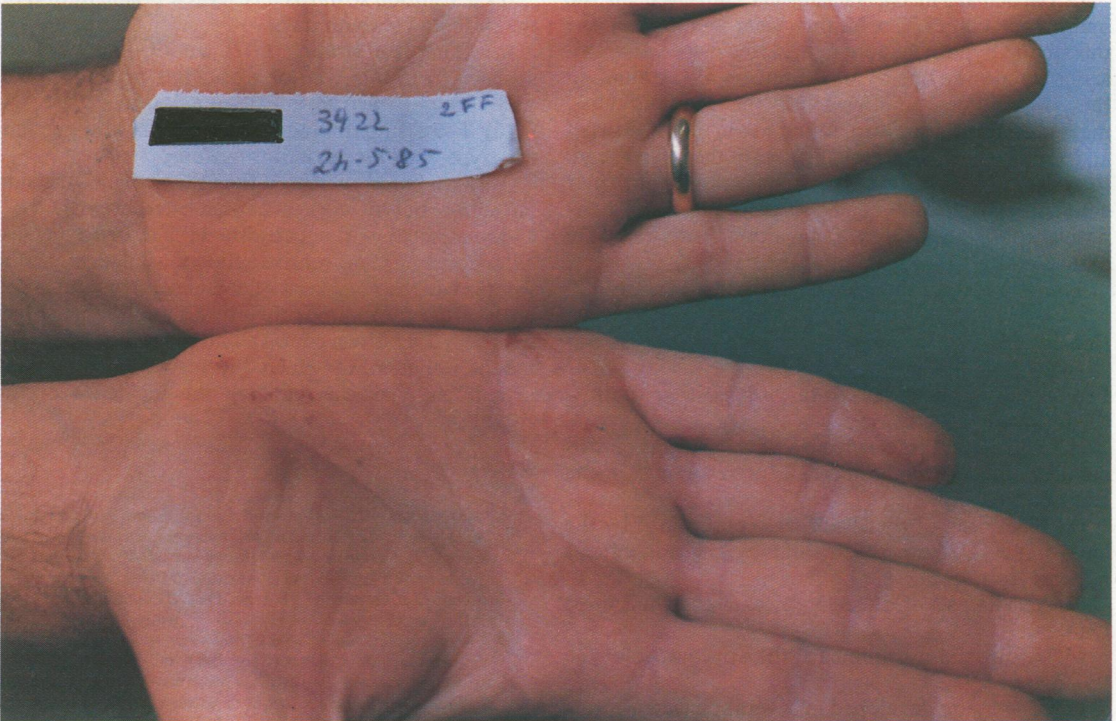
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No	42
Men/women	38/4
Age	39.9 ± 4.2
Working seniority	14.7 ± 1.3
Weight (kg)	66.4
Height (cm)	160.1
Rural population	32
Townfolk	10

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**Fig 1** *Dermatosis from resorcinal in subject employed on the manual machines.*



**Fig 2** *Dermatosis from resorcinal in subject employed on the automatic machines.*

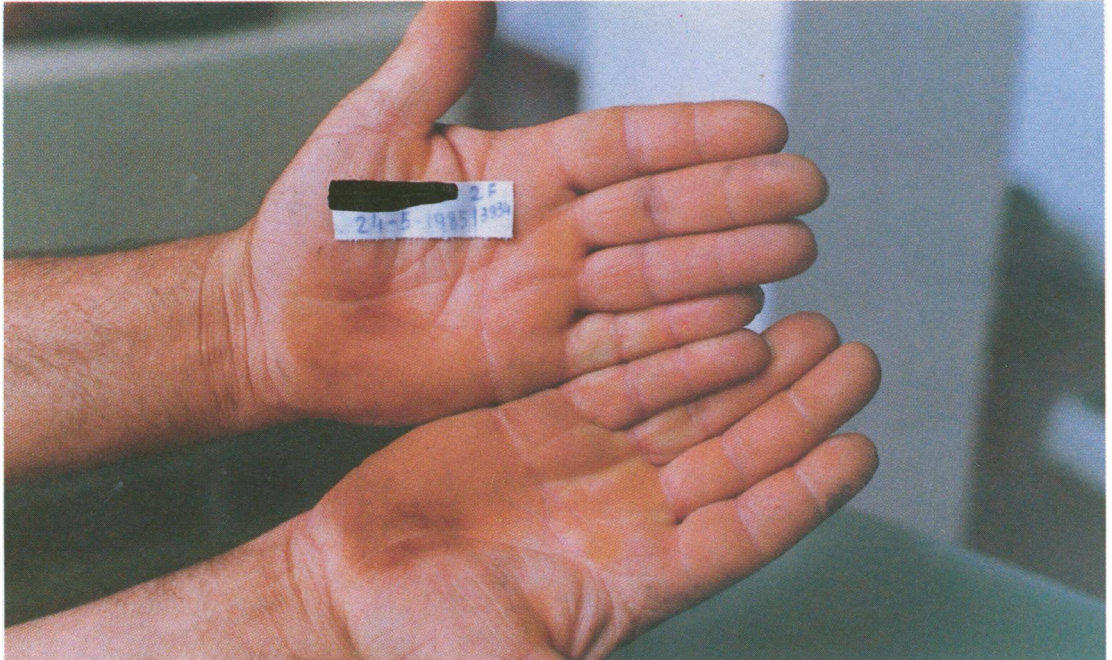


Fig 3 Dermatitis from resorcinol in subject employed alternatively on the two types of machines.

type of machine used and the mode of work.

In particular, in the 12 subjects employed on the manual machines the lesions were mainly on the thenar and hypothenar eminences, the palms, and, to a lesser extent, the tips of all the fingers of the hand; in the 14 workers employed on the semiautomatic machines, the lesions were found mainly on the tips of all the fingers, on the flexor surfaces of the fingers, and, to a lesser degree, on the thenar and hypothenar eminences; in the other eight subjects employed alternatively on the two types of machines, the lesions were almost entirely on the palm of the hands.

The skin test results were negative in all subjects.

### Conclusions

From what has been said so far, it is possible to draw the following conclusions:

(1) All the subjects affected developed dermatitis coincidentally with the increase of resorcinol in the compound.

(2) The onset of the lesion was conditioned by the environmental temperature and by the consequent hyperperspiration.

(3) In all cases it affected the skin that had most contact.

(4) Atopy did not influence the appearance of the lesion.

(5) The lesion developed in several phases:

(a) Erythematous areas of a reddish colour beginning after a daily working shift on average.

(b) Evolution of areas of red violet pigmentation

after two to three days.

(c) Evolution towards a rusty red pigmentation on the sixth and seventh days.

(d) Complete healing after about one week of absence from this type of work; this phase is sometimes accompanied by fine desquamation.

(6) The skin pathology observed was of a pigmentary type with a weak irritating component.

This study has increased the knowledge of the skin pathology in tyre workers caused by resorcinol.<sup>4</sup>

The affected workers absorbed the resorcinol transcutaneously and preventive action must depend on the rotation of the workers and technical modification both of the compounds themselves and the machines so as to reduce direct contact with the compounds. The use of polymers in which the resorcinol is already mixed may help in reducing the incidence of the condition.

### References

- 1 Boccalon P, Paoletti A, Marini Bettolo P, Fabri G, Bergamaschi A. Dermite da resorcinolo nell'industria della gomma. At 46° Congresso Nazionale Società Italiana di Medicina del Lavoro e Igiene Industriale Catania (Italy) 1983, 515-9.
- 2 Iacovone MT, Graziano C, Sassi C. Disturbi cutanei in lavoratori della gomma: esperienze presso il gruppo Pirelli. At 46° Congresso Nazionale Società Italiana di Medicina del Lavoro e Igiene Industriale Catania (Italy) 1983, 485-94.
- 3 Sassi C, Savatteri M, Paoletti A, Graziano C, Cioeta G, La Bua R. Tecnologia della produzione di pneumatici. At 46° Congresso Nazionale Società Italiana di Medicina del Lavoro e Igiene Industriale Catania (Italy) 1983, 73-9.
- 4 Waddell MM, Finn OA. Sensitivity to resorcin. *Contact Dermatol* 1981;7:216-8.