Oil dermatitis: an enquiry into its prognosis

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Johnson, M. L., and Wilson, H. T. H. (1971). *Brit. J. industr. Med.*, **28**, 122-125. **Oil dermatitis: an enquiry into its prognosis.** One hundred industrial workers who developed skin disease while working with soluble or cutting oils were seen. Between 6 and 13 years later 87 of these cases were contacted and their subsequent histories obtained. Of these, 42 had oil dermatitis, 10 had oil dermatitis and constitutional eczema, and 17 had constitutional eczema alone. The remainder were suffering from dermatitis other than oil or from folliculitis or could not be classified.

The groups with oil dermatitis and oil dermatitis and associated constitutional eczema had a similar outcome; 60% were clear, 23% better, and 17% unchanged, whereas of the group with constitutional eczema only 35% had cleared with 41% better and 24% unchanged. Of the cases with oil dermatitis 82% had changed their job. Those with mild oil dermatitis who had not lost work had the best prognosis. Of other factors that might influence prognosis there was no direct correlation with the length of time off work, the age of onset or the payment of compensation. However, if the worker continued to be exposed to oil for more than one year after the onset of the dermatitis the chances of subsequent clearing were less than if the exposure was shorter.

This paper is a study of a group of industrial workers who had been in contact with soluble or cutting oils for varying lengths of time and who developed skin disorders. They had sought legal advice on account of their rashes and were referred to one of us (H.T.H.W.) for examination and assessment. A report was submitted, the contents of which were not disclosed to the individual concerned. Between 1956 and 1963 one hundred cases were seen. In 1969 a questionnaire was sent to all these individuals and 87 replies were received. Six patients had died or left the country but from the remaining 81 replies it was possible to relate the eventual outcome of the dermatitis with the initial diagnosis and with other factors such as change of employment, payment of compensation, and the length of exposure to oil.

Diagnostic categories

At the initial interview and examination a diagnosis was made under one of the following labels:

1. Oil dermatitis
2. Oil dermatitis with associated constitutional eczema
3. Oil folliculitis
4. Dermatitis other than oil
5. Constitutional eczema
6. Unclassifiable

Points in favour of a diagnosis of dermatitis were absence of previous skin trouble, a history of exposure to oil at the relevant time, and a description of a rash involving the appropriate areas of the hands and arms. These were normally the backs and sides of the fingers, the interdigital webs, the backs of the hands, and the front and sometimes the backs of the wrists and the forearms up to the elbows. In a right-handed person the right hand was often but not invariably affected more than the left. Other points which were regarded as important were deterioration while remaining at work and improvement on ceasing contact with oil. Recurrence soon after re-exposure was regarded as particularly significant.

In many cases the rash had cleared at the time of the examination and the diagnosis was made entirely on the history. Others had active dermatitis or at least some healing dermatitis on the hands and arms while a few brought only the smell of oil on their clothes and the presence of blackheads as evidence of heavy exposure.

Seventeen cases were regarded as purely constitutional on account of the character and distribution of the rash. Seven had symmetrical vesicles on the palms and sometimes the soles and were considered to be suffering from cheiropompholyx. Four had a patchy rash which did not correspond to the areas of exposure. This was regarded as discoid eczema but a rash was not regarded as constitutional simply because of its patchy character if it was otherwise acceptable as dermatitis. Two cases were diagnosed as seborrhoeic eczema because of involvement of the face and neck, particularly the retroauricular folds. The remainder were labelled constitutional eczema because the distribution was widespread and did not correspond to the area of exposure to oil.

Ten persons were classified as having dermatitis with some constitutional element. In these cases the rash usually began on the hands and arms but later spread to involve unexposed areas such as the face, neck, chest, feet or legs. Some took a long time to clear after avoiding contact with oil and this was regarded as evidence of a constitutional tendency.

Type of work

The workers came from a variety of factories in the south-east of England and the majority of the 81 who replied were machine operators whose exact occupation at the onset of the rash is shown in Table 1. No obvious difference was found in the behaviour of the rash when the individual occupational groups were considered separately so that all those in contact with oil have been treated as a single group for the purposes of this investigation.

Present state (Table 2)

The majority could be classified as having oil

TABLE 1
OCCUPATION AT ONSET OF RASH

Occupation	No.
Machine operator	
Grinder	17
Automatic lathe operator ..	13
Capstan lathe operator ..	14
Driller	11
Turner	8
Miller	5
Fitter	4
No details available ..	1
Others	
Cleaner and loader ..	5
Inspector	3
Total	81 (including one woman)

dermatitis, constitutional eczema or a combination of the two, and 56 of 69 had been followed up for eight years or more.

Of the 42 cases of oil dermatitis 24 reported that they were clear, 11 were better, and 7 considered that the dermatitis was unchanged.

Of the 17 cases of constitutional eczema 6 were clear, 7 were better, and 4 were unchanged.

Ten patients whose rash was mainly industrial but had some constitutional element have been added to the cases of uncomplicated oil dermatitis to form a reasonably homogeneous group of which 60% were clear, 23% better, and 17% unchanged.

The four workers with folliculitis were clear or improved and this oil-induced dermatosis is, in fact, very common in industry and generally produces little, if any, morbidity. Similarly, the seven cases whose dermatitis was not classifiable and the single case of contact dermatitis provoked by tetrachlorosalicyl anilide in soap were not further analysed.

Copies of available death certificates showed that none of the persons who had died had died of an industrial disease.

TABLE 2
PRESENT STATE OF ALL CASES

Disease	No.	Clear	Better	No change	Compensation
Oil dermatitis	42	24 (57%)	11 (26%)	7	25 (60%)
Oil dermatitis with constitutional eczema	10	7	1	2	3
Oil folliculitis	4	3	1	0	2
Dermatitis other than oil	1	1	—	—	1
Constitutional eczema alone	17	6	7	4	5
Unclassifiable	7	4	0	3	1
Dead or left country	6	—	—	—	—

Factors influencing the outcome

Changing job (Table 3)

Of the 46 who had changed their job 26 (57%) lost the rash. From the replies which were sufficiently detailed to give information the majority of clearances occurred within a few months of avoiding oil, 27 out of 31 within a year, 2 after two years and, surprisingly, 2 after six and seven years respectively.

Six cases with mild or transient dermatitis remained in the same job and in five the rash subsequently cleared, often as a result of increased protection or a change in the brand of oil.

TABLE 3
JOB OUTCOME

	No.	Clear	Better	No change
Oil dermatitis				
Same job ..	6	5	0	1
New job ..	46	26 (57%)	12 (26%)	8
Constitutional eczema				
Same job ..	5	2	3	0
New job ..	12	4	4	4

Sufficient detail was available in 46 of the 52 replies to correlate the outcome with the length of continuing exposure to oil after the dermatitis began (Table 4). Of 16 who were exposed for less than a year 14 cleared, whereas of 30 exposed for longer than a year only 15 cleared. One of the unchanged cases with long exposure had many oil warts and had had treatment for squamous-cell carcinoma.

In the constitutional group the results for those in the same job and those who had sought alternative employment were worse than in the group with oil dermatitis.

Age at onset (Table 4)

There is no evidence that age alone had any effect on prognosis. Table 5 shows the age distribution of the whole series and that of all workers in the engineering industry. Our figures do not suggest that any age group was particularly liable to dermatitis although constitutional eczema tended to affect the older worker.

Work loss (Table 4)

A few mild cases lost no work at all but of the remainder there was no close relationship between the amount of work lost and the prospects of ultimate clearance.

TABLE 4
CASES OF OIL DERMATITIS: PRESENT STATE
BY VARIOUS FACTORS

	Total	Present state		
		Clear	Better	No change
Oil dermatitis				
All cases ..	52	31 (60%)	12 (23%)	9
Exposure:				
Less than 1 yr ..	16	14 (87%)	2	0
More than 1 yr ..	30	15 (50%)	8	7
Not known ..	6			
Age at onset:				
Under 40 ..	28	16 (57%)	7	5
40 or over ..	24	15 (63%)	5	4
Out of work:				
Never ..	9	8	—	1
Less than 3 mth.	28	16	7	5
3 mth or more ..	15	7	5	3
Compensation paid:				
Yes ..	28	14 (50%)	8	6
No ..	24	17 (71%)	4	3

Compensation (Table 4)

Of 28 cases of oil dermatitis who received some form of compensation 14 considered that their skin was clear. Only 5 received payment before the dermatitis cleared and 14 were still affected after having been awarded compensation. Of those who received no award 17 out of 24 considered that their skin was clear. It appeared, therefore, that compensation itself did not affect the prognosis and there was no time relationship between clearance of the rash and receipt of a settlement.

TABLE 5
DISTRIBUTION BY AGE

Age	Whole series	Oil dermatitis	Constitutional eczema	All industrial workers ¹
Less than 20	2	1	1	—
20-29 ..	17 (21%)	10 (20%)	0	25%
30-39 ..	26 (32%)	17 (32%)	7	22%
40-49 ..	15 (19%)	12 (24%)	2	23%
50-59 ..	16 (20%)	9 (18%)	6	21%
60+ ..	5	3	1	9%
Total ..	81	52	17	

¹All men employed in the engineering industry in the United Kingdom in 1969 excluding those under 20.

Discussion

The composition of the main classes of industrial lubricant and coolant oils have been reviewed by Key, Ritter, and Arndt (1966) and Hodgson (1969). The insoluble lubricating oils are responsible for oil acne and folliculitis while eczematous dermatitis results from exposure to soluble cutting oils and coolants (Key *et al.*, 1966). The roles of the various constituents of these oils are discussed by Key and his colleagues (1966), Hodgson (1969), and Gellin (1969).

Three main patterns of dermatitis are described by Hodgson (1961), namely an acute irritant dermatitis, a dry erythematous eruption on the hands followed by a discoid eczematous pattern on the arms, and an allergic dermatitis due to additives. True allergic dermatitis to additives is believed to be rare (Schwartz, Tulipan, and Birmingham, 1957) although an occasional case has been reported (Fregert and Skog, 1962). All or nearly all our cases are believed to belong to Hodgson's first two patterns.

Gardiner (1922) described peaks of industrial dermatitis at 30 and at 60 while MacCormac (1937) attributed the later peak to an increased liability to constitutional eczema as age increased. Our figures (Table 5) show a greater incidence of oil dermatitis in the fourth decade but no later peak. More cases of constitutional eczema occur in the fourth and sixth decades but the numbers are small.

Considerable variation has been recorded in the prognosis of industrial dermatitis. Of 124 patients observed by Hellier (1958) only 29 (23%) cleared. Many of Hellier's patients were coal miners but he found that once dermatitis had developed the outlook was poor and not greatly influenced by a change of occupation.

We found extreme difficulty in following up our cases; only about 30 replies were received to our original questionnaire so that exhaustive enquiries were necessary to trace 87 of our 100 cases. On the whole the outlook was found to be reasonably good considering that these were all persons who had sought legal advice on account of their skin disorders and were presumably a sample of those more seriously affected. The rash had cleared in 60% of cases and in a further 23% had improved. Those considered to be suffering from constitutional

eczema did not do well and only about one-third cleared.

The prognosis is generally considered to be worse in the older worker (Hellier, 1958) but in our series this was not so and the outlook was much the same in those over 40 as in the 20 to 40 group.

Compensation has also been regarded as having a powerful influence on recovery but we did not find that it had any effect on the outlook.

Although some of those with mild and transient dermatitis were able to remain in the same job most sought other employment. When this was done early the rash cleared in nearly every case. The outlook was worse, however, for those who remained in the same work for over a year after the onset of the rash. Half of these cases eventually cleared and even in the most chronic cases the outlook was not hopeless.

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