INDUSTRIAL DERMATITIS DUE TO DIESEL OIL - A STUDY OF 25 CASES

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It is estimated that nearly 50% of all occupational diseases involve the skin[1]. Among the numerous and kaleidoscopic involvement of the skin of occupational origin, that due to diesel oil is a typical and common one. In the Road Transport Industry, automobile industries and the Railways, this is a frequent problem. Apart from big cities, this type of dermatitis may be increasingly seen even in rural areas due to rapid expansion of mechanised farming. In organised industries, the affected workers may be forced to demand a change in their work or allotment to other sections in the same Workshops where they can avoid coming in contact with diesel oil. This may not always be possible for the management to oblige. Although industrial dermatitis due to diesel oil is not a disabling condition, it does sometimes lead to absenteeism among the affected workers and consequently a hindrance to production and wage loss to the affected workers. The author has observed that although several workers are employed in work situations involving diesel oil, only some persons developed this dermatitis after only a few months of exposure, while some persons have completely escaped and seem to resist inspite of being engaged in the same work for several years. Thus there appears to be a marked constitutional factor in the pathogenesis of this type of dermatitis. It was thought that particular blood groups may have a bearing about this constitutional factor. The relation of blood group and some diseases is well known. Recently it is observed that blood group 'A' predominates in the cases of puerperal thrombophlebitis.[2] Blood group testing, being a simple procedure, may be usefully employed in testing the possibility if any particular blood group / groups predominates in the affected workers and those who are exposed but not affected with dermatitis inspite of several years exposure to diesel oil. Besides, this might be used as a screening test during pre-placement medical examination of the prospective employees who might be allotted to work connected with diesel oil.

In the actual management of this problem of oil acne, prophylaxis plays a great part. Skin protective barrier creams and ointments have a definite role in controlling the incidence and morbidity due to diesel oil. Banerjee and Chakrabarty have tried an ointment containing Dimethicone-20 (Siloderm) in a wide variety of skin disorders and found very encouraging results.[3] However, in their series of 50 cases there was only one case due to diesel oil.

The purpose of this paper therefore is (A) to test whether any particular blood group or groups predominate among the affected workers and those who are exposed for several years to diesel oil but never afflicted with dermatitis. (B) to test the efficacy of Dimethicone-20 in the management of industrial dermatitis due to diesel oil.

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Material and Methods

A. 25 workers of this industrial organisation affected with typical oil acne are subjected to this investigation. Blood grouping (ABO system) was done on all the workers. Total WBC count, differential WBC count, haemoglobin estimation and urinalysis were also done. Besides a thorough physical examination was also made including respiratory, cardiovascular Gastro-intestinal systems etc., to detect any possible deleterious effects of systemic absorption of diesel oil. Another group of 25 workers who are also working in the same sections of the workshops exposing them to diesel oil for 3 years and above, but who have never developed oil acne were also studied with reference to their blood groups.

B. All the 25 workers who were affected with industrial dermatitis due to diesel oil were regularly supplied with Dimethicone-20 containing ointment (Siloderm). They were instructed well to apply this ointment as a thin film over the affected parts (the forearms) before they actually commence their day's work and allowed to proceed with their normal duties. They were also instructed to report immediately about any untoward effects like skin irritation, burning sensation, erythema etc. Besides they were also given Vitamin C (100 mg ti-d) A and D capsules 1 t-i-d and Tetracyclines whenever pustules were present.

Results

A. The results of the blood group studies are as tabulated below :—

Blood group	No. of persons affected with dermatitis.	No of persons exposed to diesel oil. but not affected with Dermatitis	Total
A	9	9	18
B	9	4	13
AB	2	1	3
O	5	11	16

B. The results of the treatment of the 25 workers affected with dermatitis who were given Dimethicone-20 containing ointment were noted during a period of 6-8 weeks. The workers were regularly observed at weekly intervals. The results are graded as :—

Excellent :

When all the follicles have subsided no fresh follicles have appeared, the pustules should have healed rapidly, their work performance is good and if they felt greatly relieved of the troublesome complaint.

Good :

When all the follicles have healed, no fresh follicles should have occurred, the pustules when present should have cleared up rapidly.

Satisfactory :

When more than half of the follicles have healed and at the same time no fresh crops of follicles should have occurred.

Grading	No. of cases	percentage
Excellent	19	76
Good	4	16
Satisfactory	2	8

Discussion

The association of certain blood groups and the development of some diseases is well known. For example, there is an increased liability to haemorrhage among duodenal ulcer patients with blood group 'O', similarly the association of blood group 'A' and carcinoma of stomach is also well known. Recently it is observed that blood group 'A' predominates in the cases of puerperal thrombophlebitis. In the experience of the author, of the several workers exposed to diesel oil, some persons have developed oil acne while the others have completely escaped in spite of several years exposure to

diesel oil. This clearly shows that there is a constitutional factor which protects some workers and the others are very susceptible. It is thought that blood groups may have some relationship to this constitutional factor, besides providing a simple screening test on the prospective employees. Patch testing with (Primary) irritant substances is not of much help. Sutton[4] has hinted that persons with seborrheic tendency should not be hired for this kind of work (involving the diesel oils). This also is not a reliable criterion in the selection of the workers. The results of the present study showed that all the blood groups were represented among the affected and non-affected workers in varying proportions. Blood group 'A' is evenly distributed. Out of 13 persons in the blood group 'B' 9 have developed dermatitis and 4 did not develop dermatitis. Approximately it means that out of every 3 persons with blood group 'B', 2 are liable to develop dermatitis when exposed to diesel oil. Out of 16 persons with blood group 'O' only 5 persons have developed dermatitis whereas 11 persons have escaped the development of dermatitis in spite of long exposure (over 3 years). Here again it means that approximately only one person out of 3 persons with blood group 'O' is liable to develop dermatitis when exposed to diesel oil. Regarding 'AB' group, the series is too small to draw any inference. The above results therefore indicate that blood grouping provides only a rough guide in the selection of prospective employees who might be engaged in works connected with diesel oil. Apart from blood groups, there is still other constitutional factor/factors which require further elucidation.

In the actual management of the affected persons, prophylaxis plays a great part. They must scrupulously observe personal hygiene both during and after work. Frequent change of the oil will help. Skin protective devices like gloves etc., are not suitable in this type of work because they will hinder the work and unacceptable to the workers. A skin protective barrier cream or ointment is therefore ideally suitable to this type of work. Dimethicone (a silicone oil) is a well known skin protective substance.[5] In the present series of 25 cases, 76% showed excellent response and 16% showed good response. It is remarkable that in all the workers who have used this ointment, no fresh folliculitis was observed during the course of treatment. Further, the already existing lesions have very quickly subsided and even the pustules have rapidly healed. The satisfaction and the soothing relief voluntarily mentioned by the affected workers is also remarkable. Further, no absenteeism was observed among the persons treated with this Dimethicone-20 containing ointment. This in itself is a considerable gain both to the workers and the management since there is no wage loss to the former and production is not hampered to the latter. It was well tolerated by the workers and no untoward effects were noted. The physical examination revealed only regional lymphadenitis and no deleterious effects of systemic absorption were noted.

Summary and Conclusion

(1) 25 workers affected with industrial dermatitis due to diesel oil and 25 workers who were exposed to diesel oil for over 3 years but who never developed dermatitis were studied with reference to their blood groups. It is observed that blood group 'A' is evenly distributed among affected and non-affected persons. Two out of every 3 persons with blood group 'B' have developed dermatitis, whereas only one out of 3 persons with blood group 'O' developed dermatitis. It is concluded that blood grouping provides a rough screening test for the prospective employees to be engaged in work connected with diesel oil during pre-placement medical examination.

(2) Dimethicone-20 containing ointment (Siloderm) was used on 25 workers affected with oil acne and found to give excellent result in 76% of the cases and good result in 16% of the cases. It is concluded that this ointment is reliable and safe in the prophylaxis and management of industrial dermatitis due to diesel oil.

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5. Goodman LS and Gilman A: The Pharmacological Basis of Therapeutics, Macmillan Company, London, 1965, p. 979.

True or FALSE?

The delayed blanching reaction to intracutaneous injection of Mecholyl in atopic individual is due to vasoconstriction.

(Answer at Page No. 155)