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OCCUPATIONAL CONTACT DERMATITIS AMONG CONSTRUCTION WORKERS

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ABSTRACT

Background: Occupational dermatitis among construction workers is a major occupational health concern. The two most important occupational hazards for construction workers are irritant and allergic cement contact dermatitis. The objective of this study was to investigate the severity of occupational contact dermatitis and the common allergens among construction workers in Srinagar. **Methods:** A total of 100 cement workers from a construction site were included in the study. A structured questionnaire was used to evaluate the demographic data and work-related activities of these cement workers. A complete skin examination was conducted, and skin manifestations were assessed. All patients were patch tested with Indian standard battery of patch allergens. **Results:** Our results showed that 70 out of 100 construction workers were suffering from occupational contact dermatitis. The most affected skin area was the hand. Thickening of the dorsal surface of the hand, especially around the metacarpophalangeal joint area, and hyperkeratosis of the palm were the major skin manifestations. The results of the patch test showed that 25 out of 100 were allergic to potassium dichromate, 12 were allergic to thiuram mix, nine and eight were allergic to cobalt chloride. The final diagnosis, based on the results of the skin examination and the patch test, showed that 45 of 100 cement workers had irritant contact dermatitis and 25 had allergic contact dermatitis.

KEYWORDS: Allergic contact dermatitis; construction workers; chromium hypersensitivity; irritant contact dermatitis.

INTRODUCTION

The construction industry is one of the world's major industries. It is an essential contributor to the process of development. Being an unorganized sector the workforce is at risk of developing safety and health related hazards at work. Occupational dermatoses (OCD), defined as a skin disease that would not have occurred if the patient had not been doing the work of that occupation' is one of the frequent occupational diseases. Occupational skin diseases represent approximately 40% of all occupational illnesses; different percentages from one country to another are determined by the extent and the type of industrialization and also by the knowledge and experience of the physicians.OCD is a significant occupational hazard in some jobs, like the construction industry. In the construction industry, various categories of workers are involved such as masons, helpers, fitters, supervisors, carpenters and painters. The common irritants at construction site are cement, chalk, fly ash, hydrochloric and hydrofluoric acids, fiberglass and rock wool, chromate, cobalt, epoxy resin, rubber, leather gloves, adhesives (phenol or urea formaldehyde resins), wood preservatives and polyurethane resins. Among workers who contact with cement regularly, occupational dermatoses, especially contact dermatitis, has been one of the most frequently reported disorders for many years.[1]

Skin contact with cement and other construction materials has been associated with irritant contact dermatitis, which ranges from cement burns to cumulative irritant contact dermatitis. Cement burns causes an acute ulceration[2] most frequently seen in new and untrained cement workers. In non-sensitized workers who are exposed to cement on a regular basis, cumulative irritant contact dermatitis may result.[3] In addition to irritant contact dermatitis, the exposure to other allergens in cement is a significant cause of occupational allergic contact dermatitis. The most important allergens in cement are soluble hexavalent chromium (chromate) compounds.[4] In addition to soluble hexavalent chromium, other metals such as nickel, cobalt and also ingredients of the gloves such as rubber chemicals, latex, epoxy resins and preservatives

are well-known allergens for the cement workers. Reported prevalence of allergic contact dermatitis to chromate among this population usually is more than 10%.[5] Concrete, which is widely used in masonry, floor laying and other occupations, is a mix of portland cement (calcium, silica, iron, and alumina), sand, aggregate, and water. Fly ash, gypsum, and blast-furnace slag may be added to produce blended-cement products. Contact with wet concrete can cause both irritant and allergic contact dermatitis. Irritant dermatitis, which can be acute or chronic, is caused by the concrete's alkaline and abrasive properties. Irritant dermatitis can also be caused by solvents, soaps, asphalt, dust, fiberglass, abrasives and mechanical trauma or friction.[6] Diagnosis and management of occupational dermatoses (OCD) is often inadequate. It is more poorly addressed in resource limited countries. A Huge number of workers are employed in its construction sectors. The skin contact to cement or its mixtures or other construction materials can therefore be a major health problem in this group. The objectives of our study were to investigate the severity of occupational cement contact dermatitis and the common allergens among cement workers in Srinagar.

METHODS

A cross sectional study was conducted at a large construction site in Srinagar in May 2014. All the 100 construction workers working at the site in were selected. After a complete physical examination, data were recorded in a pre-designed structured questionnaire, providing a detailed job condition, personal and past dermatological history and the length of employment in the current job position. The duration of exposure was calculated as years in occupation. In addition, the subjects were asked about their personal work habits, use of protective gloves and the type of gloves used. All patients were patch tested with Indian standard battery of patch allergens. Allergens were put into almunium chambers and occluded for 48 hours.Test site was examined at 30 minutes after removal of patches and than at 96 hours and again on 7th day. Analysis of reactions and relevance of positive test was assessed as per standard guidelines. All collected data were checked and rechecked for omissions, inconsistencies and improbabilities. Data analysis were performed by Statistical Package for Social Science (SPSS), version-20.Prevalence, percentage, mean and median were calculated.

RESULTS

Table 1: Age wise distribution.

Age	Frequency	Percentage
<18	10	10
18-45	68	68
>45	22	22
Total	100	100.0

Table 2: Duration of work (Year/s).

Duration	Frequency	Percentage
<1	8	8
1-5	71	71
>5	21	21
Total	100	100.0

Table 3: Protective measures.

Protective measures (Boot, Gloves, Apron/ jacket, Googles and Sufficient water)	Frequency	Percentage
Available or used	28	28
Not available or not used	72	72
Total	100	100.0

Table 4: Prevalence of skin disease among construction workers (n=100).

Occupational contact dermatitis	Frequency	Percentage
Present	70	70
Absent	30	30
Total	100	100.0

Table 5: Skin Manifestations of Construction Workers.

Symptoms	Frequency	Percentage
Thickened/lichenified	65	65.0
Hyperkeratosis	60	60.0
Scaling	35	35.0
Dryness	32	32.0
Erythema	26	26.0
Fissure	21	21.0
Pigmentation	14	14.0
Vesicles/papules	13	13.0
Itching	5	5.0
Scratch	3	3.0
Edema	3	3.0
Erosion	2	2.0
Ulceration	1	1.0

Table 6: Findings of the patch test for construction workers.

Allergens	Positive frequency	Positive percentage
Potassium dichromate	25	25.0
Thiuram mix	12	12.0
Cobalt chloride	9	9.0
Nickel sulfate	8	5.0
Clioquinol (Chinoform, Vioform)	1	1.0
Colophony	1	1.0
Paraben mix	1	1.0

DISCUSSION

Rapid urbanization and industrialization have imposed a huge load of construction works worldwide, which creates different social, cultural and health impact.

In the current study among one hundred construction workers 70 % of them have at occupational contact dermatitits. In the current study only 28.0% workers had opportunity to use any form protective measure. The prolonged exposure to construction materials for years without almost no protective measures may be cause of this high rate of contact dermatitis.

Occupational cement hand dermatitis among construction workers is an important issue and the most common allergens are potassium dichromate, thiuram mix, and cobalt chloride.

Many strategies have been proposed to prevent chromium hypersensitivity in cement workers, including the use of protective gloves to prevent direct hand contact with cement, the use of protective barrier cream, such as ascorbic acid cream and the addition of ferrous sulfate to cement. The addition of ferrous sulfate to cement was proven to be an effective way to reduce chromium hypersensitivity.

The construction workers are a group of less skilled workers who start the occupation without previous training; this situation facilitates the emergence of occupational dermatitis. More over in this study almost all workers are belong to low socio-economics class, they have limited excess to healthcare, lack of sufficient health education. All these factors produce a cumulative affect to their health specially skin health which can be prevented by providing improved work place, protective means, health education, adequate health services and improving professional skills. We recommend the addition of ferrous sulfate to cement, and the use of gloves without thiuram mix, to prevent occupational hand dermatitis in cement workers.

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