Pattern of Skin Diseases among Migrant Construction Workers - A Community Based Cross-Sectional Study from Andhra Pradesh, India

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ABSTRACT

BACKGROUND

Workers in a construction site may be exposed to various hazardous substances, physical agents, poor hygienic living conditions and harsh environmental factors. It is associated with plethora of health risks and increased risk of various dermatological conditions is one such phenomenon which needs evaluation. We did this study to assess the prevalence and pattern of skin diseases among migrant construction workers.

METHODS

The current study was a community based cross-sectional study. Group of construction workers working in a single cluster were selected by convenient sampling. Data collection was done from March to September 2019. All the migrant construction workers, who were available onsite were screened by a team of qualified dermatologists and diagnosis of skin diseases was made using clinical skills and lab facilities. Descriptive analysis was carried out by mean and standard deviation (SD) for quantitative variables, and frequency and proportion for categorical variables. Data was analysed using IBM SPSS statistical software version 21.

RESULTS

A total of 833 construction workers were screened. There was a high male preponderance, with male to female ratio of 7.42:1. The overall prevalence of any dermatological morbidity was 36.2 %. Infective skin diseases contributed to 61.56 % of the dermatological morbidity. Among infective conditions, fungal infections (65.5 %) were the most common infective dermatoses. Mite infestation (scabies) was found in 46 (23.35 %) workers. The common bacterial infections observed were furuncle and folliculitis in 7 (3.55 %) subjects each. Sycosis barbae was seen in 2 (1.02 %) subjects. Viral infections like herpes and molluscum contagiosum have contributed to the minor portion of the dermatological morbidity. One subject was found to have Hansen's disease. Allergic contact dermatitis (29.27 %), photodermatitis (14.63 %), miliaria (12.20 %), hand eczema (9.76 %) and irritant contact dermatitis (7.32 %) were the common non-infective skin conditions affecting the study population.

CONCLUSIONS

There is high burden of dermatological morbidity among construction workers. Majority of the skin conditions were infective in nature. Poor literacy levels, overcrowded living conditions and poor personal hygienic practices were the possible risk factors.

KEYWORDS

Dermatological Morbidities, Construction Workers, Prevalence

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BACKGROUND

Construction industry had witnessed massive growth across the globe in the last few decades, especially in developing economies like India. Working in a construction industry has been reported to be associated with plethora of health risks.[1] Increased risk of various dermatological conditions is one such phenomenon. Construction workers are exposed to multitude of chemicals and physical factors predisposing them to a variety of skin disorders. The range of chemical exposures may include cement and related substances, petroleum and related products used in the paints, metals, concrete mixture, silica, granite etc.[2,3] The most common allergen exposures reported among construction workers were chromate, epoxy resin, cobalt, nickel, thiuram mixture and black rubber mix.[4] Exposure of skin to harsh environmental conditions,[5] living in overcrowded and unhygienic living conditions are important risk factors.[6]

The reported prevalence of dermatological morbidity among Indian construction workers has been reported to be ranging between one third to as high as two thirds.[6-8] Some of the studies have reported infective conditions to be the predominant type of dermatological disease and few studies had reported irritant and allergic contact dermatitis to be the most common contributor to dermatological morbidity.[8,9]
It is vital to have an understanding of the common profile of dermatological conditions among immigrant construction workers by the clinicians. This may aid in planning effective screening and management strategies to manage the dermatoses among this high-risk population. Also, the studies documenting the burden may help in drawing the attention of all the relevant stakeholders towards this major public health problem. With this background, the current study was conducted to assess the prevalence and profile of dermatological conditions among the migrant construction workers.

METHODS

The current study was a community based cross-sectional study, conducted in the field practice area of NRI medical college and general hospital, which is tertiary care teaching hospital. The data collection was done during March to September 2019. The study population included all migrant construction workers, who were working in a cluster of construction sites selected by convenient sampling.

All the migrant construction workers, who were available on site were screened by a team of qualified dermatologists and diagnosis of skin diseases was made using clinical skills and lab investigations such as skin biopsy, potassium hydroxide (KOH) smear examination and slit skin smear as required. Informed written consent was obtained from all the participants for participation in the study. Appropriate treatment was provided to all the skin diseases identified. Skin disease of public health significance like Hansen's disease were reported to concerned public health authorities, for necessary action. Health education on personal hygiene, need to use personal protective equipment and measures to be taken to prevent occurrence and spread of skin diseases was provided to the entire study population.

Ethical Considerations

The study was approved by the intuitional human ethics committee (Ref: ECR / 1160 / inst / AP / 2018). Informed written consent was obtained from all study participants. Confidentiality of the study participants was maintained throughout the study.

Statistical Analysis

Data was analysed by IBM SPSS statistical software version 21. Descriptive analysis was carried out by mean and standard deviation for quantitative variables, frequency and proportion for categorical variables.

RESULTS

A total of 883 subjects were included in the final analysis. The overall prevalence of any dermatological morbidity was 36.24 % (95 % confidence interval-CI, 33.1 % to 39.5 %) in the study population. Infective skin diseases contributed to 61.56 % of the dermatological morbidity and remaining 38.43 % was contributed by non-infective skin diseases. (Table 1)

Parameter		Number	Percentage
Prevalence of dermatological morbidity (N = 883)	Yes	320	36.24
	No	563	63.76
Nature of dermatological morbidity (N = 320)	Infective	197	61.56
	Non-infective	123	38.43

Table 1. Prevalence and Nature of Dermatological Morbidity (N = 883)

Among the study population, the mean age was 32.63 ± 10.03 years and majority (69.69 %) of the participants were aged between 21 to 40 years. There was a high male preponderance, with male to female ratio of 7.42:1. The proportion of study population with no formal schooling and completing only up to primary schooling was 37.5 % and 34.69 % respectively. One fourth of them studied up to secondary school, with very minor portion of them studying beyond secondary school. (Table 2)

Parameter		Summary
Age group (N %)	Up to 20	24 (7.50 %)
	21 to 40	223 (69.69 %)
	41 and above	73 (22.81 %)
Gender (N %)	Male	282 (88.13 %)
	Female	38 (11.88 %)
Education (N %)	Illiterate	120 (37.50 %)
	Primary schooling	111 (34.69 %)
	Secondary schooling	80 (25 %)
	Higher than secondary schooling	9 (2.81 %)

Table 2. Summary of Baseline Characteristics of People Affected by Dermatological Morbidity (N = 320)

Close to three fourths of the participants were working in the construction industry for more than 10 months duration, with an average duration of stay at the construction site being 14.57 ± 6.17 months. More than half

(52.81 %) of workers were masons with direct exposure to cement and concrete. Carpenters / painters constituted 17.19 %, followed by other types of skilled and supervisory staff. The working hours ranged between 8 to 12 hours with majority of them reporting 10 working hours per day. (Table 3)

	Parameter	Summery
Duration of stay in months (mean ± SD)		14.57 ± 6.17
Duration of stay, N (%)	1 to 5 months	22 (6.88 %)
	5 to 10 months	64 (20.00 %)
	More than 10 months	234 (73.13 %)
Specific work, N (%)	Mason	169 (52.81 %)
	Carpenters / painter	55 (17.19 %)
	Supervisors	22 (6.88 %)
	Helpers	22 (6.88 %)
	Electrician	12 (3.75 %)
	Plumber	11 (3.44 %)
	Welding work	9 (2.81 %)
	Driver	6 (1.88 %)
	Office boy	6 (1.88 %)
	Machine work	4 (1.25 %)
	Surveyors	4 (1.25 %)
Working hours, N (%)	8 hrs.	34 (10.63 %)
	10 hrs.	182 (56.88 %)
	12 hrs.	104 (32.50 %)

Table 3. Work Related Parameters of People Affected by Dermatological Morbidity (N = 320)

In the study, 91.88 % of the subjects were living in shared rooms with average number of persons per room being 5.88 ± 2.9. More than half of them were living in shared rooms with more than 5 people. Only a minor proportion (8.75 %) of them reported bathing twice, 181 (56.56 %) have reported bathing after work and 111 (34.69 %) were bathing only before going to work. Majority of the construction workers approached pharmacist (54.38 %) or local registered medical practioner (RMP) (30.63 %) for treatment of their skin conditions. Very minor proportion (7.5 % each) had contacted general practitioner or a dermatologist. More than half of them have reported washing clothes only once in every 5 days or more and only 60 % of them have reported regular use of personal protective equipment. (Table 4)

Parameters		Summary
Housing (N %)	Individual room	26 (8.13 %)
	Sharing room	294 (91.88 %)
	Number of persons per room (mean ± SD)	5.88 ± 2.9
Number of persons per room (categories) (N %)	1	26 (8.13 %)
	2 to 5	124 (38.75 %)
	> 5	170 (53.13 %)
Bathing, N (%)	After work	181 (56.56 %)
	Before work	111 (34.69 %)
	Both	28 (8.75 %)
Health seeking behaviour, N (%)	Pharmacy	174 (54.38 %)
	Registered medical practitioner	98 (30.63 %)
	General practitioner	24 (7.50 %)
	Dermatologist	24 (7.50 %)
Frequency of washing clothes (days), N (%)	Once in 2 days	24 (7.50 %)
	Once in 3 days	117 (36.56 %)
	Once in 5 days	136 (42.50 %)
	Once in a week	43 (13.44 %)
Regular use of protective wear, N (%)	Yes	192 (60.00 %)
	No	128 (40.00 %)

Table 4. Descriptive Analysis of Housing in the Study Population (N = 320)

Fungal infections were the most common infective skin conditions with tinea corporis 65 cases (32.99 %), tinea cruris 39 cases (19.80 %) being the major contributors (Figure 1). Candidiasis was present in 6 (3.05 %) of the subjects. Mite infestation (scabies) was found in 46 (23.35 %) workers. The common bacterial infections observed were furuncle and folliculitis in 7 (3.55 %) subjects each. Sycosis barbae was seen in 2 (1.02 %) subjects. Viral infections like herpes (Figure 2) and molluscum contagiosum have contributed to the minor portion of the dermatological morbidity. One subject was found to have Hansen's disease. Allergic contact dermatitis (29.27 %), photodermatitis (14.63 %), miliaria (12.20 %), hand eczema (9.76 %) and irritant contact dermatitis (7.32 %) were the common non-infective skin conditions affecting the study population. (Table 5)

	Infective Skin Conditions (N = 197)		Non-Infective Skin Conditions (N = 123)	
	Diagnosis	**N (%)**	**Diagnosis**	**N (%)**
			Allergic contact dermatitis	36 (29.27 %)
Fungal infections	Tinea corporis	65 (32.99 %)	Photodermatitis	18 (14.63 %)
	Tinea cruris	39 (19.80 %)	Miliaria	15 (12.20 %)
	Tinea incognito	8 (4.06 %)	Hand eczema	12 (9.76 %)
	Tinea versicolor	8 (4.06 %)	Irritant contact dermatitis (ICD)	9 (7.32 %)
	Candidiasis	6 (3.05 %)	Seborrheic dermatitis	7 (5.69 %)
	Tinea pedis	3 (1.52 %)	Melasma	6 (4.88 %)
			Fissure feet	6 (4.88 %)
Mite infestation	Scabies	46 (23.35 %)	Acne	4 (3.25 %)
			Urticaria	3 (2.44 %)
Bacterial infections	Furuncle	7 (3.55 %)	Xerosis	2 (1.63 %)
	Folliculitis	7 (3.55 %)	Psoriasis	2 (1.63 %)
	Sycosis barbae	2 (1.02 %)	Keloid	2 (1.63 %)
	Ecthyma	1 (0.51 %)	Vitiligo	1 (0.81 %)
Viral skin conditions	Herpes labialis	2 (1.02 %)		
	Herpes zoster	1 (0.51 %)		
	Molluscum contagiosum	1 (0.51 %)		
Mycobacterial infection	Hansen's	1 (0.51 %)		

Table 5. Profile of Infective and Non-Infective Skin Conditions (N = 320)

Figure 1. Tinea Corporis

Figure 2. Herpes Zoster

DISCUSSION

Construction industry is one of the important sectors in developing economies. Construction activity is highly concentrated in large urban conglomerations. Majority of the construction workforce are often migrated from remote areas and face with unhealthy working and living conditions. Hence, they are reported to be at risk of various fatal and non-fatal occupational hazards. Many of these morbidities

are documented to be much higher among them than the general population.[10] Skin diseases are one of the common and most neglected of these.

The current study, which was an attempt to document the burden and profile of the skin disorders among the construction workers had documented the prevalence of dermatological morbidity to be 36.24 % (95 % CI 33.1 % to 39.5 %). A study by Banerjee M et al.[7] conducted in Karnataka had reported almost similar prevalence of 36.2 % among migratory construction workers. Another study conducted in Kerala by Jayakrishnan T et al.[11] reported 16.1 % of the construction workers to be suffering from skin diseases but the proportion of illiterate population in our study is considerably higher compared to that study, which may be a contributing factor for higher prevalence of skin diseases in our study. The other important direct determinants like personal hygiene and living conditions have not been reported in their study. Another study by Shah, KR et al.,[8] have reported a prevalence of 47.8 %, which is considerably higher than our study. This study was conducted in Ahmedabad in western India. Another study by Kiran, KG et al., from Karnataka had reported 22.6 % prevalence. Varying prevalence of skin conditions was reported from other parts of the country including 20.3 % by Ashish, T et al.[12] 25.64 % by Jasani, PK et al.[13] and 38.9 % Banerjee M et al.[14] An epidemiological study conducted on wood workers showed (57 %) of them having skin problems.[15] Apart from the inherent differences in the demographic structure and living conditions, the geographical region and meteorological conditions of the region may also contribute to these wide variations in the prevalence of dermatological morbidity among construction workers.

In the current study, the major proportion of the skin diseases were of infective in nature. Similar pattern of skin diseases was reported by most of the studies from other similar settings. In study by Senapathi P et al.[6] infectious skin diseases were found among 64.3 % of the study subjects while 34.7 % of them had non-infectious skin diseases. Kuruvila M et al.[9] have reported infective dermatosis among 89.72 % of labourers in their study. As compared to other occupations, the relative contribution of infective dermatoses seems to be much higher among construction workers. As reported from many previous studies and the current study, majority of the construction workers are migrated, often live in overcrowded, poorly ventilated, makeshift accommodations. Significant proportion of the workers have reported taking bath only once, which also can be a major contributing factor for higher burden of infective skin conditions.

Out of the infectious skin diseases, fungal infections (tinea) were the most common, followed by scabies. Wide range of bacterial, viral and mycobacterial infections were also observed in minor portion of subjects. Similar pattern was observed by many other studies. In study by Kuruvila, M et al.[9] fungal infections contributed close to half of the dermatoses, followed by bacterial infections and scabies. Tinea infections have been reported to be the most common infective dermatoses in various other occupational and non-occupational settings across the globe.[16-18] Working in hot and humid environments, leading to continuous perspiration and moist skin conditions coupled with poor personal hygiene are ideal conditions for occurrence of fungal dermatoses. Sleeping in overcrowded rooms, sharing of linen etc. also may be responsible for higher prevalence of scabies and other infective dermatoses. The fact that most of them are not seeking the help from qualified medical professionals may lead to delayed diagnosis, treatment and higher rates of transmission of infective dermatoses.

The major contributor for non-infective dermatoses were allergic contact dermatitis, photo dermatitis and hand eczema. Construction workers have been reported to be highly susceptible to allergic and irritant contact dermatitis by many authors. Cement has been reported as an important cause of contact dermatitis.[19] Apart from cement, exposure to wide range of chemical and corrosive substances, improper of no use of personal protective equipment are key predisposing factors.[20]

CONCLUSIONS

There is high burden of dermatological morbidity among construction workers. Majority of the skin conditions were infective in nature, predominantly caused by fungi and itch mite. Poor literacy levels, overcrowded living conditions, poor utilisation of personal protective equipment, and poor personal hygienic practices were the most important risk factors for occurrence and spread of skin diseases among the construction workers. There is a strong need to sensitize all the relevant stakeholders, including the construction workers, their employers, health care practitioners, and public health authorities on the high burden of dermatological morbidity in these populations. There is strong need to conduct periodic screening programs to promote early detection and treatment of skin diseases. Emphasis must be given to various workplace level and personal level interventions aimed at primary prevention of skin diseases in this population.

Limitations

We could not perform suitable inferential statistical analysis to find out the association between various demographic, lifestyle related and workplace related factors and skin disease in the study population. The possibility of inter-observer variation, resulting in under or overestimation of the burden may also be considered as a minor limitation. Also, the generalisability of the study findings is limited.

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