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June FOR Reserve	Original Research Paper	Dermatology			
Internation®	CLINICO-EPIDEMIOLOGICAL PROFILE OF OCCUPATIONAL DERMATOSIS IN AUTOMOBILE WORKERS IN URBAN SHIMLA, HP.				
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Introduction: Allergic contact dermatitis (ACD) is a growing concern among automible workers due to ABSTRACT increased contact of chemicals and oils routinely and exposure to a large number of allergens on day-today basis. Aims And Objectives: To assess the demographic profile and pattern of CD suspected cases. Materials And Methods: It was a observational study in which 256 automobile workers were included. History and clinical examination was done and clinical findings were recorded on a standardized proforma. Results: A total of 256 patients were enrolled. All the automobile workers were males between age group 16 to 65 years with mean age of 27.20±8.26 years. Clinically, sixty (23.43%) workers were found to have signs and symptoms of contact dermatitis (CD). Hands was the most common site involved. Conclusion: There is a need to create awareness among these workers to adopt self-safety measures during routine tasks.

KEYWORDS:

INTRODUCTION:

Occupational dermatoses are skin diseases that are caused or aggravated by substances present in the working environment. Further, occupational contact dermatitis (OCD) is an inflammatory response of the skin to external factors (allergens, irritants) present in an occupational setting[1]. Development of OCD is related to exposure to wet work, friction, handling of chemicals and working practices and individual susceptibility; further its severity depends on the type of chemical and intensity of exposure. OCD constitutes up to 30% of all occupational diseases[2]. It is one of the leading causes of occupational morbidity, absenteeism, missed work days and even loss of occupation.

Occupational dermatoses mostly affect young people and account for approximately 30% to 45% of all occupational diseases and are estimated for 25% of all lost workdays in united states[3]. In Asia, statistics regarding the magnitude of problem is not available. In India, automobile garage workers are mainly males with low-wages and low education. They perform tasks such as spray painting, repairing, cleaning, welding, servicing and general work such as washing of vehicles[4].

Frequent hospital visits by patients with hand dermatitis inspired us to plan this study amongst predisposed occupational groups (automobile repair workers). We planned to visit the automobile workshops in Shimla city to screen the workers for occupational dermatoses. Thus, this study was planned to determine the clinico-epidemiological profile of dermatological disorders among automobile workers and to study various risk factors associated with occupational dermatological disorders.

MATERIAL AND METHODS:

This was an observational cross-sectional study conducted over a period of 1 year i.e. 1st July 2018 to 30^{th} June 2019 at a tertiary care hospital of Northern India among automobile repair workers of Shimla city of HP.

Sample Size:

Expectancy prevalence of skin disorders is 18% (Attwaet al[2]2008) and absolute precision of 5%, confidence interval of 95%, non-response rate of 10%, sample size was

Where p = prevalence (from previous studies), q = 100 - p, L =allowance error (5-20% of p)

Taking non response rate of 10%, sample size came out to be 260.

Screening for occupational skin diseases in automobile repair workers was done by visiting the garages in Shimla city.

Sampling

We enlist all the garages in all the 34 wards of Shimla city and a total of 260 automobile workers were randomly selected.

Inclusion Criteria

1. All automobile repair workers of age >18 years.

2. Workers willing to give consent

Exclusion Criteria

1. Those who did not give consent to participate.

METHODOLOGY

Self-designed pre-tested questionnaire was used to collect the information regarding socio- demographic profile and clinical parameters of patients.

After applying inclusion and exclusion criterion, from all the 34 wards of Shimla city, a total of 256 workers were randomly selected and screened for dermatological diseases. The skin evaluation of patients at work place was carried out on all participants.

History And Clinical Examination:

Socio-clinical details regarding age, gender, occupation, duration and evolution of dermatitis, site of onset and progression, aggravating factors, work-relatedness of the rash, location of job when the rash began, past and present treatment taken, personal history of atopy and family history was asked from all the automobile workers included in study for screening.

- Seasonal variations, aggravation with contact and remissions when away from the inducing antigen.
- A thorough clinical examination of site and type of lesions was recorded on a designed proforma.

Skin Examination:

 $\eta = 4pq/L2 = 4X18X82/5X5 = 236.16 \approx 236$ persons.

A thorough clinical examination of site, particularly of hands,

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forearms and head and neck, distribution and type of lesions was done on every participant and clinical findings were recorded on a standardized proforma. Irritant contact dermatitis (ICD), allergic contact dermatitis (ACD), folliculitis, superficial mycosis (tinea, pityriasis versicolor, onychomycosis), atopic dermatitis, chemical burns and nail changes (traumatic nail changes, leukonychia) were noted in dermatological examination. The distinction between ACD and ICD was made on clinical characteristics.

Analysis of data was done on Epi-info software. P value less than 0.05 was considered significant.

OBSERVATIONS:

The present study was conducted in Department of Dermatology, Venereology and Leprosy, IGMC, Shimla over a period of one-year w.e.f 1st July 2018 to 30th June 2019. A total of 256 automobile workers were screened for the occupational skin diseases. Patients with dermatological disease were examined and further investigated in Outpatient clinic of Dermatology, Venereology and Leprosy department of I.G.M.C, Shimla.

Age And Sex Distribution

All the automobile workers were males between age group 16 to 65 years with mean age of 27.20 ± 8.26 years. Majority of the workers i.e. 126 (49.2%) were young adults in age group 16-25 years (Table 1).

Table 1: Age Distribution Of Study Subjects

Āge group	Frequency	Percentage
16-20	56	21.9
21-25	70	27.3
26-30	55	21.5
31-35	41	16
>35	34	13.3

Risk Factors Associated:

Table 2: Risk Factors Associated With

Characteristic		Disease Absent	Disease Present	P Value
Āge group	≤30 years	69	112	< 0.001
	>30 years	11	64	
Duration of work	≤10 years	72	121	< 0.001
(years)	>10 years	8	55	
Personal history of	Positive	0	9	0.032
atopy	history			
	Negative	80	167	
Working hours	≤ 6 hours	36	16	< 0.001
-	>6 hours	44	160	
Protective	Yes	2	4	0.609
measures used				
(masks, glows or barrier creams)	No	78	172	

Sub-occupational Group:

Table 3: Sub-occupations Of Subjects With Or Without Disease

Sub-occupational	Disease	Disease	P Value
group	absent	Present	
Body repair workers	12	40	0.631
Motor mechanics	8	15	
Automobile electricians	10	16	
Painters	11	23	
Tire repair workers	15	22	
Automobile washers	10	22	
Multitask workers	14	38	

No statistically significant difference was detected between prevalence of skin diseases between the subgroups.

All 256 automobile workers were examined for dermatological involvement. Various dermatological diseases were observed in 176 (68.75%) workers. Clinically, sixty (23.43%) workers were found to have signs and symptoms of contact dermatitis (CD). There were no signs suggestive of dermatological involvement in 80 (31.25%)workers. There was statistically significant association of dermatological diseases with work duration.

Table	4:	Distribution	Of	Dermatological	Disease	Ās	Per
Work I	Dui	ration.					

Dermatological disease	Work duration ≤6 hour /day	Work duratio n >6 hour /day	Totαl (n=256)	P value
CD	2	58	60 (23.4%)	<0.001
Nail change	2	29	31 (12.1%)	
Occupational stigmata (cuts, bruises, burns, callus, etc.)	5	53	58 (22.65%)	
Acne vulgaris	8	15	23 (8.94%)	
Superficial mycosis	0	6	6 (2.34%)	
Folliculitis	0	5	5 (1.9%)	
Other	1	25	26 (10.1%)	

Below paragraph can be used to divide contact dermatitis into ICD (\sim 70-80%) and ACD (\sim 20-30%) with ICD on hands and only 1-2 pts on arm and more pts with hands, arm and face etc in ACD)

Distribution of Lesions

Out of all 256 exposed workers, 118 (46.09%) workers had hands involved in the form of occupational stigmata (calluses or corns, cuts, burns etc.) in 58 workers and contact dermatitis in 60 workers. Distribution of CD lesions in most of the patients was bilaterally symmetrical over hands and forearms. Fiftynine (98.33%) patients showed involvement of hands and other body parts, out of which forty (66.67%) patients had lesions only over the hands. Out of nineteen patients who had involvement of hands along with other parts of body, fourteen (23.33%) patients had lesions over hands and forearms and four (6.67%) patients over both hands, forearms, face and neck and one (1.67%) patient had involvement of both hands and feet. One (1.67%) patient had involvement of both forearms, flexures of extremities and neck (Table 12).

Table 5: Various Body Parts Involved In Patients With CD

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Body parts involved in CD	Number of patients		
	n (%) = 60		
Only hands	40 (66.67)		
Hands and other body parts	19 (31.66)		
- Hands and forearms	14 (23.33)		
- Hands, forearm, face and neck	4 (6.67)		
- Both hands and feet	1 (1.67)		
Forearms, flexures and neck	1 (1.67)		

In hands, involvement of palmar aspect was most common and observed in thirty-two (53.33%) patients followed by involvement of both palmar and dorsal aspect of hands in twelve (20%) patients and exclusive involvement of fingers in eight (13.33) patients (Table 13). Apart from hands, involvement of other body sites was seen in twenty (33.33%)

61.

patients with CD as described above in Table 5.

DISCUSSION:

Automotive service industry is one of the largest in the world. It is estimated that 50% of this sector is unorganized[6]. This sector is more prevalent in rural areas when compared to urban areas due to lower penetration of organized sector into this area. There has been significant increase in occupational dermatosis paralleling industrialization.

Occupational dermatosis are skin diseases that are related to working environment, caused or aggravated by substances in working environment. Occupational skin diseases (OSDs) constitute up to 30 % of all occupational diseases[7,8]. Occupational contact dermatitis (OCD) constitute 90-95% of OSDs[3,9,10]. It ranks, in many countries the first or the highest amongst all notified occupational diseases and cause of occupational morbidity, missed workdays and even loss of occupation[11-14]. Automobile repair work is a high risk occupation and workers during their activities are usually exposed to fuels, solvents, various oils, greases, skin cleansing agents, epoxy resins, metals, rubber, preservatives and other additives[2,6,15-17].

This study was conducted in automobile repair workers in the Shimla city of Himachal Pradesh, India. The mean age of the 256 workers in the study was 27.20 ± 8.26 years and their ages ranged from 16 to 65 years similar to results of study conducted by Yakut et al[1]. A slightly higher mean age of 30.76±11.83, 30.8±9.9 and 33.7±11.2 was noted in Vyas et al[4], Philip Met al[6] and Attwaet al[2] respectively.

In present study all of the employees were males. This is in agreement with the findings of studies done by Yakut et al[1], Attwaet al[2], Vyas et a[4], Shireen et al[18] and Khalili et al[19]. Roadside mechanical activities especially in India are predominantly a masculine job, pointing towards the male gender predominance towards this occupation.

In our study, a positive correlation was found between the development of dermatological diseases and work of >6 hours/day which is similar to the studies conducted by Attwaet al[2] and can be explained by the fact that longer working hours/day, higher the level of exposure to affecting agents.

CONCLUSION:

Most of the workers did not take their occupational health and safety serious as they did not see the need to use the personal protective equipment for their safety. This may contribute to high exposure to the identified hazards and subsequent diseases among the auto mechanics. There is a need to create awareness among these workers to adopt self-safety measures during routine tasks and also of a separate study to elucidate actual occupational exposure among them, eliminating confounding factors and also to reduce working hours so as to have less chances of skin disorders.

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