



Asian Journal
of
PHARMACEUTICAL RESEARCH
Journal homepage: - www.ajprjournal.com

A STUDY ON MAGNITUDE OF CONTACT DERMATITIS AMONG FILIGREE WORKERS IN CHIDAMBARAM

S.Pravinkumar¹, P.Kalyani², AJW Felix³, T.M.Jayasree⁴, N.Ethirajan⁵,
T.K.Senthilmurugan⁶

Department of community medicine, Rajah Muthiah Medical College, Annamalai University, Annamalai
nagar, Tamilnadu, India.

ABSTRACT

In jewellery industry, exposure to various types of fumes and gases are very common. No report is available regarding the effects of those fumes and gases on the skin disease of the filigree workers who come in contact with the chemicals used in the occupation. Due to lack of proper monitoring of the workplace environments in these unorganized sectors, workers get very much affected by the occupational exposures to the irritants. The present study was undertaken to find out the magnitude of contact dermatitis among Filigree workers and to compare and correlate contact dermatitis with various socio-demographic factors and duration of occupational exposure. 296 filigree workers were interviewed with pretested proforma to elicit socio-demographic characteristics and symptoms of contact dermatitis. The magnitude of contact dermatitis among filigree workers was found to be 22.6%. Among them, 91.04% were involved in microplating type of work and 8.96% were involved in designing work. Significant association between contact dermatitis and type of work, age, sex, duration of working hours was observed. Periodic examination and personal protective measures are necessary to prevent the burden of contact dermatitis among filigree workers.

Key words: Contact dermatitis, Filigree workers, Microplating and Designing workers.

INTRODUCTION

The hazardous factor in the occupational environment may be divided into four main categories-chemical, physical, biological and ergonomics. The major part of most activity is concerned with the first two of these. The risk is due to contact between the hazardous agent and the individual and prime aim of occupational environmental control is to create the most appropriate and effective forms of barrier to prevent such contact, without imposing undue restriction on process operation, thus effectively reducing the level of risk. There are three principle routes which should always be considered – inhalation, injection or absorption through the skin and ingestion [1].

The range of occupation skin disease is by no means restricted to industrial dermatitis. Differential diagnosis from other skin disorder is critical. As approximately 90% of occupational skin disease is dermatitis caused by irritant or allergic contact factors, a detailed history should be taken. Dermatitis (non infective/inflammatory) can be classified as endogenous (hereditary/

predisposing) or exogenous (contact dermatitis). Contact dermatitis may be irritant or allergic. Irritant contact dermatitis accounts for > 90% of all occupational contact dermatitis. Irritants are substances that damage the skin by direct toxic/ irritant action, the effect of which is proportional to the nature of the chemical, the strength or concentration, the length of exposure and the individual's skin protection [1].

In jewellery industry, exposure to various types of fumes and gases are very common. Nevertheless, the effects of those fumes and gases on the skin disease of the filigree workers who come in contact with the chemicals used in occupation have not been documented. Due to lack of proper monitoring of the workplace environment in these unorganized sectors, workers get very much affected by the occupational exposures to the irritants [2].

Metal workers suffer from high rates of skin disorders [3]. About 65% of all occupational diseases are skin diseases [4]. A toxic reaction to chemicals, a reaction that

results from contact with them, and not from slow sensitization or allergic reactions, is the most common cause of occupational skin disease (Goldner) [5]. Sensitization is of tremendous importance to those jewellers who do get dermatitis as a result of repeated contact with chemicals in the workshop [6]. Hence the present study was undertaken in the temple city of Chidambaram, which is famous for the gold plated ornaments for centuries and still the gold plated ornaments produced from Chidambaram are sold almost in all parts of India and even in abroad. The present study has been undertaken with objectives to find out the magnitude of contact dermatitis among Filigree workers and to compare and correlate contact dermatitis with various socio-demographic factors and duration of occupational exposure.

Materials and methods

The community based cross sectional study was conducted in urban area of Chidambaram during October 2013 to July 2014.

The house of filigree workers was identified by field survey in urban area of Chidambaram. Data was collected from the first filigree worker identified using a pretested proforma. Details regarding the next filigree worker were obtained from first filigree worker. This was followed till the required sample size (296) was reached.

Data was collected from study subjects by the interviewer himself using pretested proforma. The proforma consisted of two parts- The first part consists of details regarding age, sex, occupation, type of work, place of work, involvement of family members, duration of working hours, number of years of working, duration of working per day and no of hours in sitting and standing position. The second part consists of details about the skin symptoms such as itching, burning sensation, erythema, hardening of skin and any precaution taken while working. Self reported symptoms of workers related to contact dermatitis were collected. Clinical examination was done by the investigator to confirm the presence of contact dermatitis.

Data analysis

Data collected was entered in Microsoft 2007 excel spread sheet, compiled and analysed using IBM SPSS version 18 statistical package. Statistical analysis such as Descriptive Statistics and Pearson Chi-square test were performed to find out association between Contact dermatitis with socio- demographic factor and with selected risk factor.

RESULTS

Out of 296 study subjects, 51.4% belonged to the age group < 30 years. Distribution of males and females are almost equal in the study subjects.

Majority (80%) of males are microplating workers. 63.5% of females are designing workers. Majority (97.2% males and 84.8% females) are full time workers. 69.7% of males and 55% of females are working for more than 5 years of duration. Most of them (92.6%) are working for 8 hours per day.

The symptoms of dermatitis are found to be more among males (71.6%) than females (28.4). This difference is statistically significant. The symptoms increases as age and duration of working hour's increases and both are statistically significant. Signs and symptoms of dermatitis are present currently or in the immediate past in higher frequency (71.8%) among microplating workers as compared to designing workers (2.8%). This difference is significant statistically. (Table no 1)

67(22.6%) workers reported symptoms of contact dermatitis: Among them, 30(44.78%) reported the symptom of itching and 24(35.82%) reported both itching and hardening of skin. (Table no 2)

Itching, burning sensation, erythema, hardening of skin symptoms are seen more in microplating workers compared to designing workers which is statistically significant. (Table no 3)

The symptoms of contact dermatitis are mostly observed in hands (79.1%). None of the filigree workers reported the use of personal protection measures. This was checked and confirmed during the data collection.

Table 1. Magnitude of contact dermatitis according to socio- demographic profile

Socio-demographic profile		Contact dermatitis				Chi-square	P value
		Present		Absent			
		No	%	No	%		
Age	<30 years	45	67.2	107	46.7	8.668	0.003
	>30 years	22	32.8	122	53.3		
Sex	Male	48	71.6	97	42.4	17.787	<0.001
	Female	19	28.4	132	57.6		
Working hours	≤4 hours	0	0	22	9.6	6.953	0.008
	8 hours	67	100	207	90.4		
Type of work	Microplating	61	71.8	24	28.2	164.354	<0.001
	Designing	6	2.8	205	97.2		

Table 2. Symptoms related to contact dermatitis

Symptoms	Number	Percentage
Itching	30	44.78
Erythema	2	2.99
Itching, erythema	4	5.96
Itching, burning sensation	1	1.49
Itching, hardening of skin	24	35.82
Erythema, hardening of skin	1	1.49
Itching, erythema, burning sensation	1	1.49
Itching, erythema, hardening of skin	2	2.99
Erythema, burning sensation, hardening of skin	2	2.99
Total	67	100.00

Table 3. Association of dermatitis among microplating and designing workers

Dermatitis	Occupation		Chi-square	P value
	Microplating (85) No (%)	Designing (211) No (%)		
Itching				
Present	58 (68.2%)	6 (2.8%)	152.887	<0.001
Absent	27 (31.8%)	205 (97.2%)		
Burning sensation				
Present	4 (4.7%)	0 (0%)	10.065	0.002
Absent	81 (95.3%)	211 (100%)		
Erythema				
Present	10 (11.8%)	0 (0%)	25.691	<0.001
Absent	75 (88.2%)	211 (100%)		
Hardening of skin				
Present	28 (32.9%)	1 (0.5%)	72.273	<0.001
Absent	57 (67.1%)	210 (99.5%)		

DISCUSSION

In this study, out of 296 workers, 22.6% workers reported symptoms of contact dermatitis in the past 6 months period (44.78% reported the symptom of itching and 35.82% reported both itching and hardening of skin). A study done in Finland by Timo Ieino *et al.*, (1998) among hairdressers, 53% of the study subjects reported work related skin symptoms [7]. Another study conducted in Korea (2001 – 2003) done by Akn YS *et al.*, revealed that skin diseases accounted for 17.2% of occupational disease, being fifth most common occupational disease following pneumoconiosis, hearing loss, infectious diseases and poisoning [8]. Park JH (2005) conducted a study on occupational skin disease among 96 hairdressers in Geoul reported 45.8% contact dermatitis [9]. Similarly in 2009, Sripaiboonkij *et al.*, in a study of glass microfiber production workers, demonstrated that workers in the factory areas had increased odds (OR 3.89, 95% CI 1.70–8.90) of reporting skin symptoms (dryness or flaking of skin, itchy skin, irritation, smarting or redness of skin, sore or tender skin, or urticaria) [10]. When the workers were classified into high and low microfiber exposure groups, those with high exposures had greater odds of reporting skin symptoms (OR 4.82 1.89–12.33) compared with office workers, suggesting a dose-response relationship [10].

According to this study itching, burning sensation, erythema, and hardening of skin symptoms were seen more in microplating workers compared to designing workers which is statistically significant. The signs and symptoms of dermatitis were present currently or in the immediate past 6 months period in higher frequency (71.8%) among microplating workers as compared to designing workers (2.8%). This difference is significant statistically. Similarly, study done by Victoria *et al.*, (2011) observed exposure–response relationships in auto body shop workers for itching or dry skin (OR 1.55, 95 % CI 1.2–2.0) and work related itchy skin (OR 1.97, 95 % CI 1.2–3.3).⁽¹¹⁾ Another study done by Cho Y *et al.*, (2005) found 40.9% of contact dermatitis, skin dryness among 1,138 health care workers in different region of Korea [12]. Similarly Moitra *et al.*, (2013) in his study reported that nearly 9% of leather tanners had dermatological diseases such as rashes and papules along with complaints of itching and burning sensation [13].

In this study, symptoms of dermatitis were reported more among males (71.6%) compared to females (28.4%) which is statistically significant. This difference may be due to the fact that most of the male workers are involved in microplating. Same findings were observed in National register of occupational diseases, maintained by

Finnish institute of occupational health; the annual prevalence of occupational skin diseases among female hairdressers was 20-40 cases per 10,000 working people [14].

In the present study, symptoms of contact dermatitis were significantly associated with age and duration of working hours. Similarly Kartik R shah *et al.*, (2010) conducted a study among 92 construction workers in Ahmadabad reported that 47.8% of had morbid skin condition and out of them 4.3% subjects had contact dermatitis. He also stated that the skin conditions are common in the age group of 20-25 years, males having ≥ 1 year exposure and those working for longer hours [15].

In the present study, the symptoms of contact dermatitis were mostly observed in hands (79.1%). None of the filigree workers reportedly used personal protection measures. This is because of unorganised work force and lack of awareness of the workers as well as their employers.

A study by Timo *et al.*, (1998) reported 60 eczema cases among 355 hairdressers (1998) through computer aided telephone interview. Only 3% were using protecting gloves while hair washing [7]. Kartik R shah *et al.*, (2010) conducted a study among 92 construction workers in Ahmadabad reported that half of the workers not using personal protective equipment had reported skin related symptoms [15].

CONCLUSION

The present study observed high magnitude of contact dermatitis among filigree workers in urban area Chidambaram. The major factors involved are duration of working hours, exposure to chemicals and lack of awareness among the workers as well as their employers on personal protective measures. Personal Protective Measures will serve as effective forms of barrier to prevent such contact, thus effectively reducing the level of risk.

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