

## HEALTH RISK IN WORKERS EXPOSED TO WET CEMENT

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### ABSTRACT

*Construction industry is one of the booming industries in the world. Workers engaged in this field are exposed to various hazardous substances. Portland cement is the common type of cement in usual usage and it consists of many toxic constituents. Exposure to these constituents may lead to various health effects and chronic complications. The study comprises 508 cases which include labors in construction field. The study group is categorized into 3 (less than 10 years of exposure, 10-20 years and more than 20 years). Sixty percent individuals belonged to the category of masons, 21 % helpers, 12% concrete mixers and 7% tile workers. Cutaneous problems have been reported by 90 % of masons. Helper group reported skin related problem as well as pulmonary ailments. Forty two percentages of workers were affected by skin rashes/ inflammations. In concrete mixers 72 % have skin burns and 23% have pulmonary function impairment. Seventy percentages of tile workers have cutaneous problems*

**Keywords:** *Cement workers, health hazards, risk and year of exposure*

### INTRODUCTION

Currently India has taken a major initiative on developing infrastructure to meet the requirements of globalization. Kerala also has a major role in globalization. In Kerala, construction activity is increased in geometric progression. High remuneration has attracted a large number of skilled and unskilled workers to this field.

Construction workers are considered as second largest workforce in unorganized sector of the country. Those who were working in the construction field are exposed to various hazardous substances. Portland cement is the most common component in construction industry and it consists of many toxic constituents. Exposure to cement has been reported to results in various occupational health problems and complications.

Calcium oxide, silicon dioxide, aluminium trioxide, ferric oxide, magnesium oxide, selenium, thallium and other impurities are the major constituents of cement. Heavy metals like nickel, lead, cobalt and chromium are also present in cement (Baby *et. al.*, 2008). Chronic exposure to cement in workers can

provoke clinical symptoms and inflammatory responses such as chronic cough, phlegm production, and impairment of lung function, skin irritation, conjunctivitis and carcinoma of various organs such as lung, stomach and colon (Abou Taleb *et al*). Contact dermatitis is one of the recurring health problems among construction workers (Shah and Tiwari 2010).

The workers are usually exposed to cement through dermal, respiratory route and to a lesser extent via ingestion. The harmful effect of cement dust upon living organism consists of irritating and sensitizing properties of its components. Long term contact of cement result in inflammatory changes or in some cases in chemical burns.

Occupational exposure to silica, major component of cement may increase the risk of autoimmune disease. Constituents in the cement such as chromium and silica stimulate inflammatory responses from workplace exposure results in specific target organ derangement and immune system might be affected (Fell *et al*, 2003; Omini and Akpogomeh, 2007; Mojimoniyi *et al*, 2007; Ogunbileje *et al*, 2010).

The present epidemiological study is an epidemiological approach to realize the health hazards of wet cement workers in Thrissur and Malappuram districts of Kerala State.

#### MATERIAL AND METHODS

The present study was conducted between November 2011 and February 2013 in Thrissur and Malappuram districts of Kerala state. Workers exposed to wet cement were included in the present study. They comprise masons, helpers, tile setters and concrete mixers. All workers are working in their respective workplaces.

A questionnaire was prepared focusing questions on all probable health hazards to which the study group were exposed. All the members of the study group were visited personally and data collected individually.

The study comprises 508 cases. On the basis of duration of work labours were

categorized into 3 (less than 10 years, 10-20 years and more than 20 years). Persistent cough, breathlessness, wheezing, sneezing, burns and rashes on skin, irritation of skin, eyes and throat, hair loss and colour change on body are the major lung function parameters and cutaneous problems included in this study .

#### RESULTS

The study comprises 508 cases (Table-1). Of these only 48 cases were females under helper category and not separately analyzed. Seventy two percent cases have more than 10 years of exposure in cement work and 17 % over 20 years.

Out of 508 individuals interviewed during the study 60 % individuals belonged to the category of masons, 21 % helpers, 12% concrete mixers and 7% tile workers. Individuals under each category (based on nature of work) were further divided in to three based on their duration of exposure to cement.

Table 1. Category and duration wise distribution of the study group

Category	Duration as cement workers			Total
	<10 years	10-20 years	>20 years	
Masons	60	186	58	304
Helpers	39	54	13	106
Concrete Mixers	20	29	11	60
Tile setter	21	12	5	38
Total	140	281	87	508

Health hazards of masons, helpers, concrete mixers and tile workers are focused in this study as they form the major part of construction industry. Lung function impairment and skin related problems are observed in most of workers. Persistent cough, breathlessness and wheezing are taken to be indicators of lung function impairment where as burning effect, skin rashes/ inflammations indicate cutaneous effects. Frequency of workers with lung function

impairment and cutaneous effects is shown in table -2.

Cutaneous problems have been reported in 90 % of masons. Sixty four percent have skin burns, 38 % have skin irritation, 33 % have skin rashes and 79 % have hair loss or change in hair colour on body. Persistent cough is reported by 30%, breathlessness is reported by 19 % of masons. Wheezing and sneezing is also

complained by 9% and 8% of workers respectively.

Helper category reported skin related problem as well as pulmonary ailments. Forty two percentages of workers were affected by skin rashes/ inflammations. Altogether ninety percentages of workers have shown skin related problems. This includes burning, irritation to skin, Skin rashes/ inflammations and hair loss/ hair change on body. Twenty eight percentages of workers have breathlessness and 33% have reported persistent cough.

Out of the 60 cases of concrete mixers we have studied 72 % have skin burning, 28 % have skin rashes and 66 % of workers have reported hair loss & colour change on body. Twenty three percentages of workers have persistent cough and breathlessness is also reported by 29% of workers.

Tile workers are also complained by skin related problems than pulmonary problems. Out of the 37 workers we have studied more than 70 percentages of workers have cutaneous problems. Sneezing is also reported by 15% of workers.

Table: 2 Frequency of lung function impairment & cutaneous effects in different categories of workers.

Symptoms	Masons	Helpers	Concrete mixers	Tile workers
Lung function impairment				
Persistent cough	30	28	23	8
Breathlessness	19	33	29	9
Wheezing	9	19	9	3
Sneezing	8	10	11	15
Cutaneous effects				
Burning effect	64	53	72	69
Skin rashes/inflammation	33	42	28	40
Irritation of skin	38	44	31	23
Hair loss and colour change on body	79	72	66	86

## DISCUSSION

Health problems of construction workers are highlighted in this study. Construction worker perform a large variety of duties concerned with building, repairing and wrecking building and so on. Their work may include mixing, pouring and spreading concrete, gravel and other materials.

Workers are exposed to cement and its potential toxicological effect during pouring and

cleaning processes. Cutaneous problems are more prevalent than pulmonary problem among masons, helpers, concrete mixers and tile workers. They handle wet cement preparations of different combinations rather than in dust form.

Cement is the common cause of dermatitis among construction workers. Skin diseases are more frequent among cement users than manufacturing workers. Because the presence of

hexavalent chromate in cement. The hexavalent form penetrates the skin easily than other forms (Korralus U *et al* 1984). Chromium dermatitis affects the dorsal region of hands and distal forearms. Other impurities such as nickel and cobalt also lead to more complications. When the cement dust comes in contact with water, hydroxides are formed that impair natural water alkalinity, living tissue leads to burning, skin rashes and inflammation.

Even though cutaneous problems are more reported by workers in the construction

field, respiratory problems are also reported by helpers and concrete mixers. This is due to the pattern of their work. They are also exposed to dry cement during their work. Hence inhalation of dry cement is more in these two groups compared to masons. Cement dust has been implicated as a cause of mucous hyper secretion and obstruction of small airways.

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