



Epidemiological Study of Certain Marble Mining Areas of Udaipur District

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Abstract

An epidemiological study was conducted in areas of marble mining pockets situated in certain areas of Udaipur district. To determine the prevalence of disease in mineworkers we have collected data from primary health centres of mining areas and also used open questionnaire and random sampling method of workers living in that area. Six sampling sites were selected for examine from mining areas. The results showed that the employees working in mining process had the highest exposure to the total and respirable dust, diseases like asthma, lung infection, URI, diarrhoea, UTI and skin diseases beside personal injuries. The prevalence of skin and respiratory symptoms were higher in workers, however, respiratory symptoms showed no significant relevance with mining occupation. Data on health-related illnesses and disease in the mining industry are scarce, and information on rates and costs is not readily available. This paper briefly discusses the current status of some health-related issues, including those involving silica dust, particulate matter, noise, skin disorders, as well as research and other activities aimed at protecting miners from occupational illnesses and disease.

Key words: Total dust, Skin and respiratory diseases.

I. INTRODUCTION

Miners are exposed to various potentially toxic or harmful materials or agents, including, but not limited to, fuels, reagents, solvents, detergents, chemicals, dust, silica dust, diesel particulate matter (DPM), noise, welding fumes, poisonous plants, trona dust, and metal dust. According to the Centres for Disease Control and Prevention (CDC) (2000) "There are many limitations on the accuracy of illness reporting." Defining what constitutes health or illness and what is an injury is sometimes confusing and often depends on what agency is reporting the data. The World Health Organisation (WHO) defines health as "a state and mental and social well being and not purely the presence or absence of disease". (World Health of complete physical Organisation, 1948.p.100).

For the purposes of this paper, mining health issues are defined as "any disease or illness employees contract while employed as miners and which could be caused by mining activities." Health issues discussed include mine-workers'

pneumoconiosis, silicosis, lung exposure to welding fumes and disorders caused by, asbestosis, hearing loss or impairment, physical disorders resulting from dermatitis/skin disorders.



Figure 1: Study area map

MATERIAL AND METHODOLOGY

The present work is empirical in nature. The data used in this work is primary in nature and has been collected from Primary health centres of that particular mining areas Salumber, Jaspura Daroli, Oondithal Gogunda, Odwas Kesariyaji, Babrmal, Lakhawali from November 2014 to October 2015. The data was also collected through face-to-face interviews using a household-based questionnaire. A cross-sectional study was done on the marble cutting workers who were exposed to dust from marble cutting. The workers were questioned about their working environment, usage of local preventive measures and health related problems. Reasons we find out in study shown in Figure 1. Tabular methods have been used to present relationships between two or more variables. We first consider the number of persons suffering from each disease group. It can be seen, from the table given below, that the mineworkers share the major burden in each disease group. These data were collected from PHCs



from that particular area. The incidence of diseases is significantly lower for family members and also for workers in the non-mining sectors. This implies that mining has a significant effect on the health of the worker.

S. No.	Name Of Disease	Winter						Summer						Rainy					
		A	B	C	D	E	F	A	B	C	D	E	F	A	B	C	D	E	F
1	Skin Diseases	185	25	61	29	60	31	190	30	50	35	50	47	195	35	40	42	30	28
2	Diarrhoea	80	16	52	113	226	28	90	18	55	108	212	37	85	19	60	95	192	45
3	PUO	82	23	425	96	93	52	80	20	320	75	100	40	75	25	440	82	96	42
4	UTI	22	2	5	123	25	74	24	10	11	114	34	63	30	5	8	105	46	55
5	URI	416	76	664	110	799	102	300	82	590	96	710	110	325	90	595	72	625	83
6	Abdominal Pain	204	25	124	109	100	28	205	27	128	86	93	33	179	35	130	97	95	41
7	Asthmatic	216	32	40	114	28	55	25	45	30	113	30	42	29	46	35	91	42	36

Table - 1 No. of affected persons

- A- Jaspura (Daroli)
- B- UndithalGogunda
- C- Salumber
- D- Lakhawali
- E- OdwasKesariya Ji
- F- Babarmal

Name of Disease	N	Mean	SD	F	Df	Result
Skin Disease	18	55.33	51.27	11.642	6, 119	***
Diarrhoea	18	85.06	65.21			
PUO	18	120.33	131.01			
UTI	18	42.00	39.16			
URI	18	324.72	268.25			
Abdominal Pain	18	96.61	58.83			
Asthmatic	18	58.28	48.18			

Table -2 Statistical Analysis of diseases

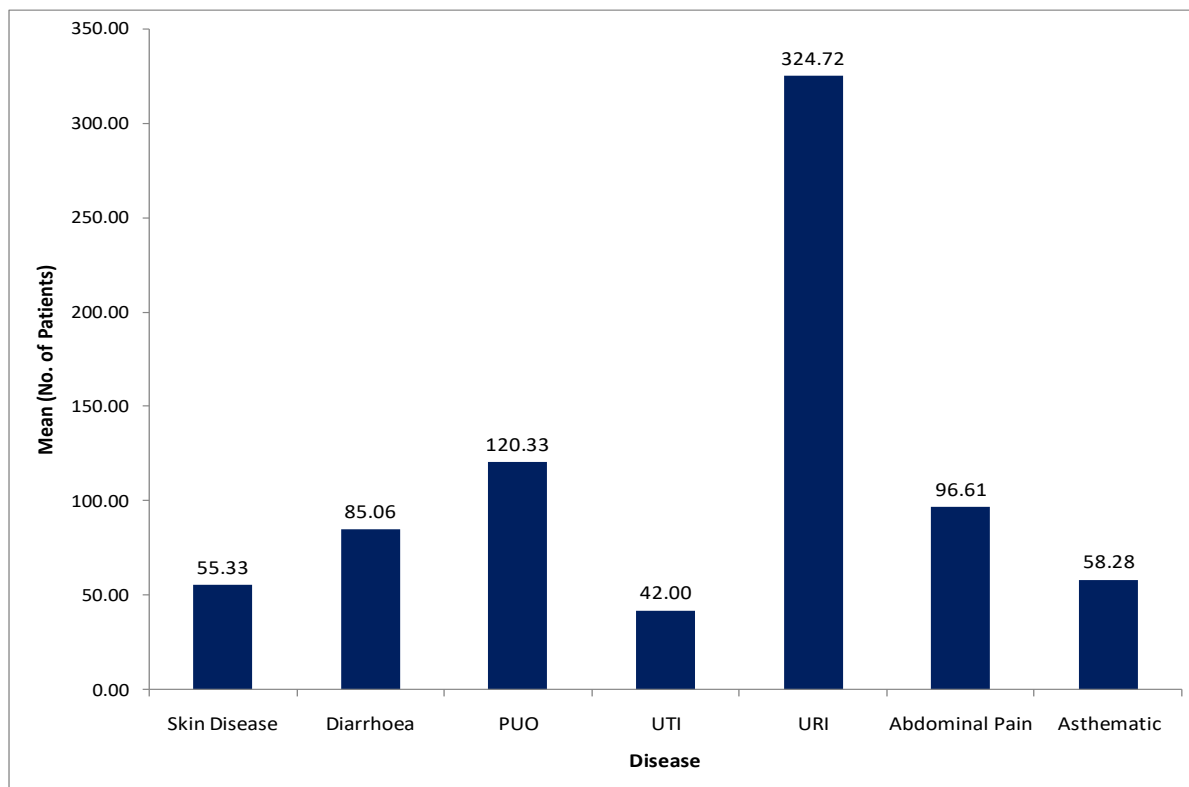


Figure -2: Graphical representation of diseases

- PUO -Fever of unknown origin
- UTI -Urinary tract infection
- URI -Upper respiratory infection

RESULT AND DISCUSSION

From environmental point of view, results indicated that marble industry has human impacts with environmental risks. Most of studies have focused on silicosis, pneumoconiosis and other diseases but in our study we have studied about general health issues of mining areas which are base of highly prevalent occupational diseases. Studies have shown that predisposing factors like smoking play an important role in aggravating lung disease in this occupational group. (Goren AI, Bruderman I.). Lung function impairment was relatively higher in miners than in controls, which could be attributable to the working conditions and the higher prevalence of the smoking habit. The results showed that the employees working in mining areas had the highest exposure to the URI. The prevalence of Asthma, Abdominal pain, skin and respiratory symptoms were higher in workers. The prevalence of hypertension was also noticed among miners, which may because of the stress of the work environment. Results also shows that in that areas illness or disease is recognized as related to work. Medical attention is received, but no relationship to work is recognized. Symptoms are recognized, but no medical treatment is sought. Miner is affected, but no symptoms are recognized. Even there are no primary health centres in that particular mining area we collected data from nearby PHCs of mining sites. So there is needed to be more aware about those areas.



The occurrence of diseases provided by the Rural Health Unit and the assessment of the respondents' diseases in the digestive system is shown in the Figure 1 and Table 1. The diseases in the digestive system recorded by the primary health centres abdominal pain and diarrhoea were one of the most prevalent. According to the respondents the incidence of diarrhoea was during rainy season. There was bacterial contamination in their drinking water However, after it was detected that the digestive problem was due to bacterial contamination, the residents who take their drinking water from the underground or through pumps.

Observations during data collection also shows that the literacy rate is also low (42%) among the miners. Pulmonary restrictive impairment was significantly higher amongst smokers as compared to non-smokers in both miners and controls. Diarrhoea, PUO, UTI, URI, Abdominal pain and asthma are common diseases but number and percentage showsthat persons are more affected from URI and abdominal pain then other diseases as shown in table-1.Ahmad (2015) reported that Chest pain and cough were the most common health problem. Musculoskeletal disorders were reported among mine workers due to manual work and wrong posture of work. Back pains were reported by one-fourth of the mine worker, and twelve miners reported joint pain. Due to dusty workplacerespiratory problem is one of the major health hazards reported by the workers.

It has been examined about the environment and health impacts due to both underground and surface method of mining for extraction.It was also found that due to land degradation and pollution have there is adverse effect on land fertility and contamination of water with the toxic chemicals. These environmental problems lead toadverse health effects with the increasing prevalence rate of diseases such as malaria, respiratory tract infections and skin diseases. (Yeboah,2008).

During study period it has been observed that mineworkers who do not get the basic facilities such as toilets, first-aid boxes, safety provisions, weekly offs. (Health, Environment and Development Consortium).Most importantly Sharma (2007) analyzed that mineworkers have to work there every day where harmful mineral dust - laden air occurs which cause many lung diseases such as silicosis, tuberculosis (TB), silicotuberculosis and asthma. The prominent places where mining is carried out for sand stone, marble and slate are Jodhpur, Makrana, Udaipur and Karauli.

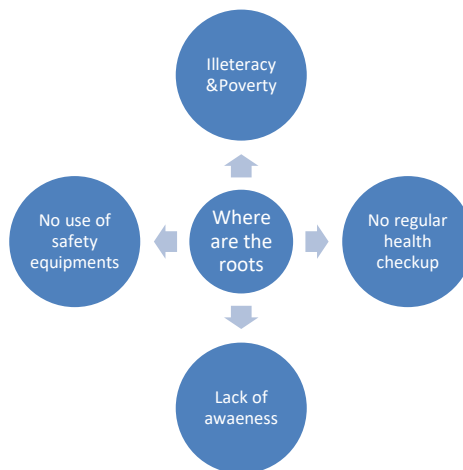


Figure-3: Showing reasons for low status.

CONCLUSION

In conclusion, we recommend that there should be regular periodic health examination and health education and the use of personal protective equipments by the workers should be promoted. Implementing engineering measures to control exposure levels will significantly benefit the health and productivity of miners. Enforcing legal regulations, especially with regard to environmental monitoring, will ensure better working conditions. Awareness regarding prevention of health hazards in the mining industry should be created among the mine management by conducting training and education programmes. This study shows that there is high morbidity amongst miners, thus indicating the need for regular health checkups, health education, use of personal protective devices, and engineering measures for control of the workplace environment.

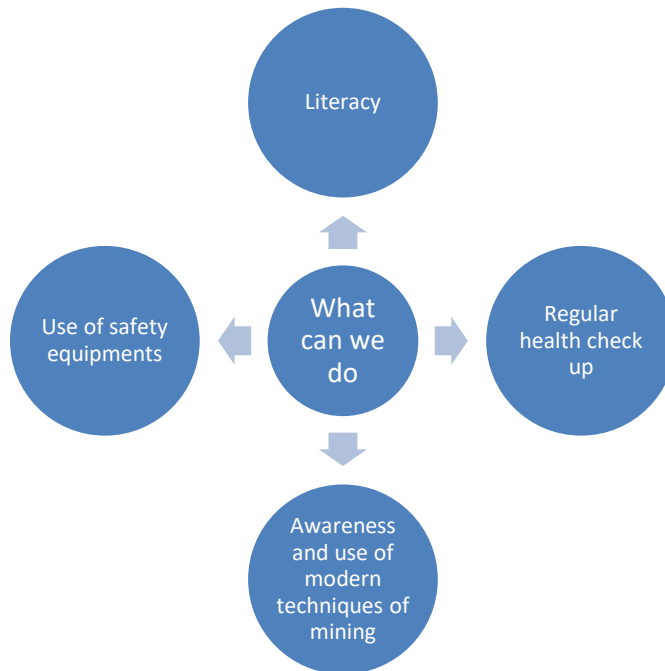


Figure-4: Showing recommendations for mine workers

From environmental point of view, results indicated that marble industry has human impacts with environmental risks; however, marble workshops need an intensive evaluation to determine the certain norms to regulate their action and to control the possible impact produced. However, marble industries must be established within industrial zones to prevent environmental-community inflects and to allow better safe competition. On the other hand, existing marble workshops have to introduce mitigation measures to minimize gradually the environmental impacts. Awareness regarding prevention of health hazards in the mining industry should be created among the mine management by conducting training and education programmes.



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