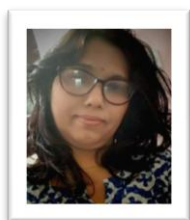


Periodic Research

Silicos is Causing New Threat to Human Health



Geeta Devi Meena
Assistant Professor,
Deptt.of Zoology,
University of Rajasthan,
Jaipur, Rajasthan, India

Neetu Kachhwaha
Assistant Professor,
Deptt.of Zoology,
University of Rajasthan,
Jaipur, Rajasthan, India

Abstract

Silicosis is an emerging disease that is caused by the fine particles in stone industries. Looking at the life threatening par of Silicos has been termed as "King of Death" by scholars. Several studies have b conducted at national and international level to highlights various facet of disease. However, there are some areas which are unnoticed by researchers. The area of the present study has also been unable in dray the proper attention of government towards the vulnerable of Silicosis. TI are more than hundred stone crafting industries on N.H.11 based on this stone, between Mehandipur Balaji and Dausa District (in the span of almos K.M.),where hundreds of workers are engaged in cutting and shaping of stone for various purpose like construction of houses and statues. S based items of this area are supplied to every part of the nation. The wor in these industries are basically from nearby villages and fall in to semi sk and unskilled category. The workers associated with these industries severely suffered from various lung diseases and respiratory tract infec Silicosis is a fibrotic lung disease caused by inhalation of free crystalline sil dioxide or silica. Occupational exposure to repairable crystalline silica particles occurs in many industries the most important factor in development of silicosis.

Keywords: Silicosis, Deaths, Health Impact.

Introduction

Silicosis is a specific form of *pneumoconioses*, a serious lung condition which is describe by the International Labour Organisation (ILO) as "an accumulation of dust in the lungs and the tissue reaction to its presence". The ILO finds out several thousand new diagnosis and symptoms of silicosis each year.

Silicosis is caused by the inhalation of airborne crystalline silica dust in high concentrations over a period of time. The silica dust enters in the lungs and is deposited in the small air sacs these are known as the *alveoli*, where the exchanges of gases occur. There fibrous tissue formation around the dust particle this process known as *fibrosis*. The fibrous tissue does not allow after infection for the easy exchange of oxygen and carbon dioxide, causing an obstruction to breathing *Buckman and Brandy (1969)*.

The area of the present study has also been unable in drawing the proper attention of government towards the vulnerable of Silicosis. There are more than hundred stone crafting industries on N.H.11 based on this red stone, between Mehandipur Balaji and Dausa District (in the span of almost 50 K.M.), The artisans are engaged in making window frames, lamps, fountains, images of gods and goddesses, animals, birds etc. for homes, temples and tombstones. These works of art cater to local market and to markets at Delhi and Agra.

Aim of the Study

This paper gives to have in depth study of the silicosis affected workers in the area, and to describe the diseases pattern of the affected so that to come across their degree of vulnerability and eventually to come out with the policy suggestions for the betterment of the area and the workers in particular.

Review of Literature

Silicosis disease is caused by inhaling repairable silica practicals reported by *Fanning, (2004)*. According to him inhalation of silica, pyrophyllite particles containing silica, crystalline silica are abundantly found in sand, rocks, and mineral ores is very harmful to human health if safety precautions are not properly used. According to study conducted by *Nash (2004)* the man working in the industries of mining, quarrying, drilling and sand blasting activities are prone to exposure of the silica particles. His

E: ISSN No. 2349-9435

study also revealed that the silicosis may be of chronic, accelerated, or acute type in which the first one is most widely noticed and develops after 10 or more years of exposure. In contrast the accelerated silicosis diagnosed if the patient is exposed to high concentration while the acute is rare and fatal. A review given by *Thomas and Kelley (2010)* stated that the size of the respirable silica particle may vary from 1-30 μm and causes impairment of the lung, fibrosis and shows increased susceptibility to development of tuberculosis, Chronic Obstructive Pulmonary Disease (COPD) and cancer. *Sen, et. al. (2016)* listed that more than 5 million silicosis patients are reported from the countries like USA, China, Europe and India and much of the cases are still unreported or undiagnosed. silica exposure, smoking, silicosis and lung cancer-complex interaction reported by *Brown (2009)*. according to him silicosis were the necessary step leading to lung cancer, enforcing the current silica standards would protect workers against lung cancer risk as well. Alternatively, a direct silica-lung cancer association that has been suggested implies that regulatory standards should be revised accordingly.

Material and Method

Detection of Disease

The identification of disease is very difficult to detect in the early stages because of the absence of any type of symptoms. Frequently dry coughing, shortness of breathing, wheezing and increasing tiredness these are the possible early indicators for identification of particular disease. Dausa district situated NH-11 There are more than hundred stone crafting industries on N.H.11 based on this red stone, between Mehandipur Balaji and Dausa District (in the span of almost 50 K.M.), The artisans are engaged in making window frames, lamps, fountains, images of gods and goddesses, animals, birds etc. for homes, temples and tombstones. These works of art cater to local market and to markets at Delhi and Agra. On the basis of presence of maximum number of silica stone quarries within the district boundary as compare to other district in Rajasthan. Agriculture is the one of the only occupation and stone work is second but during the drought years silica stone factorise becomes first occupation due to which maximum people earn their livelihood. the silica stone mining is into existing science more than thousand years. This stone is famous as red stone which is used for glorious and historical buildings in India as well as abroad. there are about 10,000 silica stone quarries which are operated openly in very small unites as an unorganized sector of small villages – Kalwan, Sikari, Raipurra, Pancholli, Manpur and Sikarai are the quarry sites. Forty five silica- stone quarries were selected following random sampling method. A totally of 370 silica stone quarry workers were selected for the study they gave their verbal as well as written consent to participate in the study 45-48 workers were selected per quarry for talking part in of the study. Interview technique was used to collect information on the pre tested schedules. The study schedule was prepared in English but it was explained in Hindi and local language to avoid gap of

Periodic Research

communication .schedules included open ended as well as multiple choice questions. The information was based on some important medico-social factors such as age, sex religion, and caste. Place of residence, age as start of working, precipitation and knowledge about disease, treatment and preventions. The collecting data organized and analysis by computer softwaer

Age groups (year)	Gender		Total
	Female	Male	
15-30	6(18.5)	9(17.4)	15(17.6)
31-45	19(57.4)	32(57.4)	51(60.3)
46-60	7(21.3)	11(21.5)	18(21.8)
61-75	1(3.3)	0(0)	1(1.4)
Total	33(100)	52(100)	85(100)

Results of This Experiment

Demographic Profile of Work Area

Among the study participants [Table 1], there were 48 females and 74 males. The result is show that their more males with chest symptoms than females. Further, about 78% were in the age group 15–35 years whereas only 3.7% people were in the age group 60 years and above. In the age group 15–30 years, there were two cases that were below 18 years. The age and sex distribution of confirmed silicosis patients based on X-ray findings was similar to the above.

Table. 1

Age and sex distribution (frequency and percentage) of All Participants at Work Place

Age groups (year)	Gender		Total
	Female	Male	
15-30	7(18.8)	18(24.3)	25(24.6)
31-45	26(58.7)	39(52.8)	65(54.8)
46-60	7(18.8)	15(20.8)	24(19.7)
61-75	3(4.6)	3(2.8)	4(3.9)
Total	45(100)	72(100)	117(100)

Discussion

The present study indicate that 70% silica stone quarry workers well knew that the silicosis based on their educational status and their knowledge about their co-workers they suffered with silicosis during their working period in stone cutter industry and their living habitat like. In this backdrop, the present study endeavors to evaluate the condition of stone cutter workers in a particular region of Rajasthan. As per the report of Indian Council for Medical Research (1999), there are about 30 lakhs worker in India who are at a high risk of exposure to silica. Among these, 17 lakhs are engaged in mining/quarrying activities, about 6.3 lakhs in glass and mica industry and rest of 6.7 lakhs in metals industry. In addition, 53 lakhs construction workers are also at the risk of silica exposure.

Conclusion

In this study overall, 85 of 123 cases (69.8) were confirmed as silicosis by the male -female and physician reports. the study corroborates the fact that longer duration exposure to free silica is associated with higher prevalence of silica reported by *Steelank and brown (1995)* Significant increases in mortality from non malignant respiratory

E: ISSN No. 2349-9435

disease (a broad category that can include silicosis and other pneumoconioses, chronic bronchitis, emphysema, asthma, and other related respiratory conditions) have been reported for silica-exposed workers Checkoway et al. 1997, 1993; *Chen et al.* (1992);(1997) Cherry et al.1998; Brown et al. 1986; *Kurihara et al* 2002 reported that exposure-response analysis and risk assessment for silica and silicosis mortality in pooled analysis of six cohorts Occupational and Environmental medicine. Fanning (2004) reported the Hazards of crystalline silica Engineer. Nash (2004) also find that the so many exposed Occupational Hazards. Glenn (2008).reported that Current issues surrounding silica. U.S. Environmental Protection Agency reported. Ambient levels and noncancerous health effects of inhaled crystalline and amorphous silica: Health issue assessment. Same results identify by McDonald *et al* (2005).

Importance of the Work in The Context of Current Status

Several studies have been conducted at national and international level to assess the impact of silicosis on human life. Having a wide range of mines, Rajasthan has also been an area of interest for researchers in this regard. However this 50km area of Rajasthan, from Mehandipur Balaji to Dausa which is a hub of stone industries, has remained unnoticed by scholars. Most of the workers are working here on the basis of "learning by doing" so they are not aware of the severity of the dust and silica particles released from the cutting and shaping of the stones. These industries are nearby rural area therefore the villagers and farms attached are also infected and adversely affected. The study will not only present the current situation of the workers and status of their health but also come with the important remedial measures to protect them from silicosis. Being located by highway sides, these industries are negatively affecting the commuters also. Therefore all such issues entail a proper attention to "King of Death" i.e. Silicosis.

References

- Buckman H, Brandy N. *The Nature and Properties of Soil*. 7th ed. New York: Macmillan; (1969).
 Checkoway H, Hughes JM, Weill H, Seixas NS, Demers PA [1999]. *Crystalline silica*

Periodic Research

exposure, radiological silicosis, and lung cancer mortality in diatomaceous earth industry workers.(1):56–5

- Chen GX, Burnett CA, Cameron LL, Alterman T, Lalich NR, Tanaka S, Althouse RB [1997]. *Tuberculosis*
 Fanning F. *Hazards of crystalline silica*. *Engineer.*(2004); 34(3):36–41.
 Glenn DD. *Current issues surrounding silica*. *Professional Safety.*(2008); 53(2):37–46.
 Kurihara N1, Wada O, Mannetje A't, Steenland K., Attfield M., Boffetta P., Checkoway H., DeKlerk N., and Koskela RS,(2002) *Exposure-response analysis and risk assessment for silica and silicosis mortality in a*
 McDonald J.C., McDonald A.D., Hughes J.M., Rando R.J., and Weill H., (2005) .*Mortality from lung and kidney disease in a cohort of North American industrial sand workers*. *Annals Occupational Hygiene* 49 pp 367.
 Nash JL. *Why are so many exposed*. *Occupational Hazards*. 2004; 66(11):30–4.
 NIOSH. *NIOSH hazard review: Health effects of occupational exposure to respirable crystalline silica*. Washington, DC: Author; 2002. (DHHS Publication No. 2002-129) Retrieved Dec. 5, 2009, from <http://www.cdc.gov/niosh/docs/2002-129/pdfs/02-129.pdf>.
pooled analysis of six cohorts Occupational and Environmental Medicine 59 pp 723-728
 Sen, S., Mitra, R., Mukherjee, S., Das, P. K. and Moitra S. (2016): *Silicosis in Current Scenario: A Review of Literature Current Respiratory Medicine Reviews*, 12: 56-64
 Terry Brown (2009):*Silica exposure, smoking, silicosis and lung cancer—complex interactions Occupational Medicine, Volume 59, Issue 2, 1 , Pages 89–95.*
 Thomas. R.H.and Kelley T.R., (2010): *A brief review of silicosis in the United States Environment Health Insights*, 4: 21-26.