



PREVALENCE OF SILICOSIS IN FLOUR MILL WORKERS IN KARAD.

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ABSTRACT

Background: Silicosis is an ancient occupational illness reported in silica mill workers, flour mill workers, agate stone workers.

Objectives: Objectives of the study were to find the prevalence of silicosis in flour mill workers in Karad.

Material and methods: In this observational study, 40 subjects were assessed using Pulmonary Function Test (PFT) and Peak Expiratory Flow Rate (PEFR).

Results: Statistical analysis of PFT and PEFR were found to be extremely significant with a p value of <0.0001.

Conclusion: The study concluded that PFT were significantly reduce in flour mill workers.

KEYWORDS : Flour mill, silica grinding stone, PFT, PEFR, silicosis.

INTRODUCTION

Pneumoconiosis is the general term for lung disease caused by inhalation of mineral dust. Silicosis is fibro-nodular lung disease caused by inhalation of dust containing crystalline silica (alpha-quartz or silicon dioxide), which is distributed widely, or its polymorphs (tridymite or cristobalite), which are distributed less widely. Quartz, the most common form of crystalline silica, is abundantly present in granite, slate, and sandstone. Granite and slate have 30-40% free silica content, while sandstone is virtually all free silica.

Silicosis has been a human scourge since antiquity. In 1705, Ramazzini cited Diembrock's description of the lungs of stonecutters "in whom he found heaps of sand that in running the knife through the pulmonary vesicles he thought he was cutting through some sandy body." In 1870, Visconti introduced the term silicosis, derived from Latin *silix*, or flint.

Silicosis is a form of pneumoconiosis caused by inhalation of crystalline silica dust reported in silica mill workers, slate pen workers, miners. Silicosis is a preventable disease and eliciting appropriate occupational exposure history is essential in clinching the diagnosis. Primary prevention in the form of dust control measures at work place and secondary measures such as use of protective gear including masks and respirators by the workers can dramatically reduce the incidence of silicosis.

Flour is fine powder made from cereals or other starchy food sources. In India, flour production is predominantly in the small scale industry (unorganized sector) and milling is accomplished by grinding grain between stones and a steel wheel. The use of the "Agra" (80% silica content) and the buff stone (81% silica) for grinding and regular chiseling by the workers in order to maintain the rough texture of the surface leads to silica dust exposure. In India, silicosis has been made a notifiable disease under the Factories Act 1948 and Mines act 1952. Few case reports in the past have referred to silicosis in flourmill workers in India.

Preventions of Silicosis:

There is no effective treatment for silicosis. As such, the only way to protect workers' health is the control to exposure to silica-containing dust.

Supportive treatment includes cough medicines, bronchodilators and oxygen if needed.

Antibiotics are prescribed for respiratory infections as

needed.

Treatment also includes limiting exposure to irritants and quitting smoking.

Those with silico-tuberculosis should be treated with anti-TB drugs.

People with severe silicosis may need to have a lung transplant.

AIM AND OBJECTIVES

Aim: To study the prevalence of silicosis in flour mill workers and its impact on respiratory morbidity in flour mill workers in Karad.

Objectives:

To find the prevalence of silicosis in flour mill workers in Karad.

MATERIALS AND METHODOLOGY:

- Materials used
- PFT device
- PEFR device
- Data Collection sheet.
- Consent form

• Methodology

Study Type: Observation

Study Design: Survey

Place of Study: Karad

Sampling Method: Simple Random Sampling

Sample Size: $n = 4pq / L^2$

Total number of subjects in study $n = 40$

INCLUSION CRITERIA

- Individuals who are working in flour mill using silica containing grinding stones for more than 5 years.
- Willing to participate in the study is included.
- Both sex male and female are included.

EXCLUSION CRITERIA

- Age < 14
- Pregnant women
- Physically/mentally challenged individual

- Past history of occupational exposure to silica dust other than flour mill.

OUTCOME MEASURES

- Pulmonary Functional Test (PFT)
- Peak Expiratory Flow Rate (PEFR)

Procedure :

The study was carried out and the result was drawn by using PFT and PEFR as the outcome measures. 40 patients (32 Males and 8 Females) were undertaken for the study. The age Group was between 40-70 years. Study place was Krishna College of Physiotherapy, OPD. As per the inclusion and exclusion criteria subjects will be requested to participate in the study. The nature of the study will be explained to the subjects and consent will be taken. Assessment: Pulmonary function test and peak expiratory flow rate will be used to assess the patient. Thus the study will be concluded by statistical analysis of the outcome measures.

STATISTICAL ANALYSIS:

Statistical analysis was done manually and by using the **Pulmonary Function Test**

	FVC	FEV1	FEV1/FVC	PEFR	FEF 25%-75%
Pulmonary function test	92.45 ± 9.557	87 ± 8.887	93.025 ± 4.276	83.575 ± 10.250	75.175 ± 8.418
T value	61.183	61.916	137.60	51.566	56.479
P value	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Remark	Significant	Significant	Significant	Significant	Significant

Peak Expiratory Flow Rate

PEFR	83.575 ± 10.250
T value	51.566
P value	<0.0001
Remark	Significant

RESULTS

There is statistically significant difference with respect to mean value of FVC in flour mill workers is 92.45 ± 9.557. There was significant reduction in FEV1 in flour mill workers is 87 ± 8.887. There is statistically significant difference with respect to mean value of PEFR in flour mill workers is 83.575 ± 10.250. There is also reduction in FEV1/FVC the mean ratio is 93.025 ± 4.276.

DISCUSSION

This project was done in 3 months with sample size 40.

This research was undertaken with the aim to find out the prevalence of silicosis in flour mill workers in Karad.

Flour is fine powder made from cereals or other starchy food sources. In India, flour production is predominantly in the small scale industry (unorganized sector) and milling is accomplished by grinding grain between stones and a steel wheel. The use of the "Agra" (80% silica content) and the buff stone (81% silica) for grinding and regular chiseling by the workers in order to maintain the rough texture of the surface leads to silica dust exposure. In India, silicosis has been made a notifiable disease under the Factories Act 1948 and Mines act 1952. Few case reports in the past have referred to silicosis in flourmill workers in India.

In this study the whole manual was explain to subject and they were encouraged to practice this manual before doing the pulmonary function test. The spirometric functions were recorded in the sitting position using an electronic computerized portable RMS spirometer. Each individual perform spirometry to produce best result of all pulmonary function tests were carried out at fixed time of the day i.e. 10am to 12pm. The room temperature was 34-36°c during the period of study. Spirometric studies were performed in flour mill workers.

statistics software INSTAT so as to verify the results derived. The statistical analysis of PFT and PEFR was done by 't' test.

Gender Distribution

GENDER	TOTAL
Male	32
Female	8

A total of 40 subjects were taken for the study. Out of 40 subjects 32 were males and 8 were females.

Age Distribution

AGE	TOTAL
40-50	24
51-60	13
61-70	3

Age group of all patients ranged between 40-70 years were taken where, 24 were in the range of 40-50, 13 were in the range of 51-60 and remaining 3 were in the range of 61-70. Peak Expiratory Flow Rate

In this study the pulmonary function test was extremely significant in flour mill workers. In these study 40 workers was involved. 32 was males and 8 was females. The result was 95% workers are normal, 5% are having mild restrictive condition.

CONCLUSION:

The current study concluded that PFT was reduced in flour mill workers.

CONFLICT OF INTEREST:

There is no conflict of interest concerning the content of the study.

SOURCE OF FUNDING: This study was self funded.

ETHICAL CLEARANCE: The study was approved by the institutional ethics committee of KIMSUDU.

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