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A study of pulmonary function tests in street sweeper compared to general population

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Abstract

A study conducted by Jafary ZA, Faridi IA and Qureshi HJ on 105 subjects using Vitalograph showed that Forced Vital Capacity(FVC), Forced expiratory volume in first second(FEV1) and Forced mid expiratory flow rate(FEF25-75%) all showed significant and highly significant decrements depending upon the extent of exposure to roadside dust.

Mariamammal T, Jaisheeba AA and Sornaraj R in their study on 249 subjects found out that in both construction and sanitary workers the mean of the actual values of FVC, FEV1, FEV1/FVC%, PEFR and FEF25-75% were significantly decreased to a greater extent when compared to control groups. All the parameters further significantly decreased to a greater extent when the years of experience of the workers increased above 15 years.

A study by Okwari OO, Antai AB, Owu DU, Peters EJ and Osim EE showed that the mean values of FVC, FEV1, FEV/FVC% and PEFR of the workers exposed to timber dust were significantly lower($P<0.01$) than in control subjects. Zodepy SP and Yogesh DS conducted a study on 273 street sweepers working in Nagpur Municipal Corporation, Maharashtra and found that the proportion of chronic respiratory morbidities like Chronic bronchitis, Bronchial Asthma & Bronchiectasis were significantly higher among street sweepers than the comparison group. Ingle ST and WAGH N found variations in lung parameters (FVC, FEV1 and PEFR) among the vehicular pollution exposed and unexposed group. Significant decrease in FEV1 and PEFR was noted in the age group of 40- 49 years of exposed population.

Raaschou-Neilson O, Neilson ML and Gehl J found a significantly higher prevalence of chronic bronchitis and asthma in street cleaners than in cemetery workers.

Keywords: Pulmonary function, street sweeper

Introduction

Materials and Methods

Source of Data

Type of study: Cross Sectional Comparative Study.

Period of study: One Year

Site of study: Shivamogga Institute Of Medical Sciences, Shimoga.

Selection of Study group and Control group

Study group: Presently working street sweepers of either sex who have been involved in street sweeping for more than 2 years.

Control group: Group D workers other than sweepers of either sex working in Shivamogga Institute of Medical Sciences, Shimoga.

Inclusion criteria

1. Age group of 30 to 50 years.
2. Subjects who have given written consent.

Exclusion criteria

1. Subjects suffering from significant cardiovascular disorders.
2. Subjects suffering from familial Bronchial asthma.
3. Chronic smokers, smoking at least 20 cigarettes per day for not less than 10 years.
4. Severely Obese individuals.
5. Individuals with significant spinal and skeletal deformities.

From a study 2, by taking standard deviation 0.5 in each group and power of 90% and a

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significance level of 1%, the minimum sample size calculated is 40 in each group. The subjects will be selected by simple random sampling method.

Method of collection of data

1. **Selection of study group:** A list of street sweepers will be obtained from City Municipal Corporation, Shimoga. A separate list of eligible subjects will be prepared from it out of which 40 candidates will be selected by simple random sampling.
2. **Selection of Control group:** A list of Group D workers other than sweepers will be obtained from the concerned authority of SIMS, Shimoga out of which 40 subjects will be selected with corresponding age, sex and height of the study group.
3. All the subjects will be tested for Pulmonary Functions using a computerized Spirometer after taking an informed consent and tested for the following parameters.
 1. Forced Vital capacity (FVC)
 2. Forced Expiratory Volume in first second (FEV1)
 3. Percentage of FVC forcefully expelled in first second (FEV1/FVC %)
 4. Peak Expiratory Flow Rate (PEFR) and
 5. Forced mid Expiratory Flow Rate (FEF25-75%)
4. Data will be collected in a pretested and semi-structured proforma on socioeconomic and demographic variables.

Note: The tests will be carried out on the subjects (study & control) in a relaxed state and privacy will be given utmost importance.

Statistical analysis: Statistical analysis will be done using the unpaired 't' test

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