ASSESSING LUNG FUNCTION AMONG SELECTED FEMALE GARMENT FACTORY WORKERS IN MATALE, SRI LANKA.

(A cross sectional study)

Ramazzini Prize Presentation, Adelaide. May 2016

DR BANDU HERATH
MBBS, MSc (Sports Medicine),Dip Occ Med

OBJECTIVES

- To assess prevalence of impaired lung function among female factory workers by measuring FVC and FEV1 in a selected garments factory from Matale, Sri Lanka.

- To explore associations between duration of employment and impairment of lung functions.

BACKGROUND

- Chronic Obstructive Airway Disease (COAD) is identified as one of four important non-communicable diseases which are on the rise in the world.

- Many factors contribute to the worsening situation including tobacco smoking, exposure to bio mass smoke, industrial gases, dusts and chemicals.

- Recent studies have recognized the contribution of dust in the workplace to chronic lung diseases, in particular COPD.

TEXTILE DUST AND COPD

- Textile dust related obstructive lung disease has characteristics of both asthma and COAD
- Cessation of exposure to cotton dusts leads to improvement in lung function.
- Most types of textile dust, such as cotton, silk and wool may contribute to COAD in textile workers.
- Over 60 million people worldwide work in the textile or clothing industry.

TEXTILE INDUSTRY IN SRI LANKA

- Employed about 400,000 people in 800 factories
- Exports Worth: $ M4,191
- Industry accounted for 7% of GDP [Central Bank of Sri Lanka,2011].
- Conditions are often poor in factories (although improving)
- Textile dust is an issue
- No studies investigating the lung functions of textile industry workers were found in accessible data bases.

METHODOLOGY

- A cross sectional study.
- On a sample of 102 female workers from the selected garments factory, lung function tests were performed by a trained physician using a portable spirometer.
- Group 1: <70% of FEV1/FVC Group 2: >70% of FEV1/FVC
- Anthropometric data (height in cm and weight in Kg) and duration of employment were recorded.

RESULTS

	N	Mean
Age (years)	102	32.9 (9.1)
Height (cm)	102	150.8 (7.3)
Weight (kg)	102	51.8 (9.5)
BMI(Kg/m^2)	102	22.8 (4.0)
Work years	102	4.9 (3.1)

TABLE 1 : BASIC CHARACTERISTICS OF THE STUDY POPULATION

	N	Mean observed (SD)	Mean expected (SD)	Observed/expected ratio as a percentage (SD)
FVC	102	2.5 (0.6)	3.1 (0.4)	82.1 (20.8)
FEV1	102	2.2 (0.4)	2.7 (0.4)	84.7 (28.2)
PER	102	4.8 (1.4	6.0 (0.8)	82.3 (29.1)

Table 2 :
Mean observed and mean expected FVC, FEV1, PER and the observed/expected ratios as a percentage FVC- forced vital capacity, FEV1- forced expiratory volume in one second, PER - peak exploratory flow rate.

Mean observed FVC was 2.5 with a standard deviation of 0 .6 whereas the expected FVC was 3.1 with a standard deviation of .4. FVC1 observed was 2.2 and expected 2.7

	Group	N	Mean number of years worked (SD)	P
FEV1/FVC	>=70% (Group 2)*	93	4.94 (3.1)	0.93
	< =70% (Group 1)**	08	4.87 (3.0)	

Table 3 *** Group 2 (FEV1/FVC >= 70%)** **** Group 1 (FEV1/FVC <= 70%)**

RESULTS

- Eight (8%)of the female garment factory workers show < 70% of FEV1/FVC ratio (Group 1)
- Ninety two (92%) of the female garment factory workers show >70% of FEV1/FVC ratio (Group 2)
- There was no association between duration of employment in the current job and drop in lung function.(i.e. Between two groups)

DISCUSSION

- GOLD criteria for diagnosis of COPD is <70% of FEV1/FVC ratio.
- Almost half of Group 2 ,too had predicted FEV1 % <80%.
- Findings suggest that there is an association between exposure to textile dust and drop in lung function.
- Finding may be an incidental Prevalence of COAD in Sri Lanka is not documented

DISCUSSION

- FEV1 and FVC among our sample were lower than the expected for many population groups of the world (Quanjer, Stanojevic et al. 2012).
- The mean FEV1 % predicted was slightly below the average found among textile workers in UK (Fishwick, Fletcher et al. 1996 Jan).
- The finding is lower than reported in other studies among general populations. (Burkhardt and Pankow 2014; Johns, Walters et al. 2014).
- We cannot evaluate particular size Vs drop in LF.

DISCUSSION

STRENGTHS

- The study design chosen (cross sectional study) was suitable to meet the objectives of the study (Rothman 2002).
- Although the sample does not represent all female garment factory workers of Sri Lanka, we believe that the chosen garment factory on average represents work environment and type of work performed.
- spirometry done by the principal investigator himself leaving less opportunity for inter-observer bias.

LIMITATIONS

- voluntary participation.
- Not administering a bronchodilator
- No across shift changes considered.
- Not measuring dust density and particle size

SUGGESTIONS FOR FUTURE STUDIES

- Study with pre and post Broncho-dilators
- Textile particle size Vs drop in LF
- Larger size (the country has 400,00 textile workers !)
- Longer time in Textile work.

CONCLUSIONS

- Study shows an 8% the female garment factory workers had <70% of FEV1/FVC.

- If supported by future studies, there is a convincing case for improvement in textile dust control/workplace hygiene in these factories.

- There is a serious lack of studies on Textile workers in country where 400,00 people work in the sector.

ACKNOWLEDGMENT

Dr. Sampath Thennakoon MBBS, MSc, PhD.

Senior Lecturer, Dept of Community medicine. Faculty of Medicine, Peradeniya, Sri Lanka.

Dr. Andrew Jeremijenko

Occupational Physician

THANK YOU