

Lung Function Abnormality in Cashew - Nut Factory Workers in Kollam District

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Abstract:

Background of the study: Cashew processing is a labour -intensive industry with limited use of technology. Workers in cashew industry are exposed to smoke, fumes and dust, which are well known risk factors for various respiratory diseases like Asthma, COPD and ILD. Little information is available on the magnitude of lung function abnormalities in cashew factory workers. Objectives of the study: 1. To study the spirometric abnormality among symptomatic cashew factory workers. 2. To study the relationship between the severity of spirometric abnormality and the duration of job and various job sections respectively.

Materials and methods: Descriptive study was conducted among workers from 10 cashew factories of Kollam district from June 2012 to December 2012. Workers from different job sections with respiratory symptoms were interviewed with a structured questionnaire and all the workers were subjected to spirometry with reversibility. Data was analysed to find out the relationship between the severity of spirometric abnormality and the duration of job and various job sections respectively after adjusting for age, sex and smoking status.

Results: 250 patients were included in the study. Mean age was 47.4 years. 32% males and 68% females. 56.25% of males were smokers. 41.6% workers were from shelling section, 20% from roasting section and 17.2% from peeling section. Mean duration of job was 19 yrs. Dyspnea (80.4%) was the most common symptom followed by cough(53.2%), allergic rhinitis (26.4%) and chest pain(4.8 %). Spirometry showed obstructive pattern in 52.4%, restriction in 8.8% and normal pattern in 38.8%. Analysis of data showed that severity of spirometric abnormality had no statistically significant association with duration of job or various job sections.

Conclusion: 61.2% of the study population had abnormal spirometry and obstructive pattern was most common abnormality .There was no statistically significant association between severity of spirometric abnormality and the duration of job or various job sections.

Suggestions: Steps like use of personal protection devices, improvement in ventilation at job sections with high smoke and dust exposure will help to reduce the respiratory morbidity in cashew factory workers.

Key words: COPD, Asthma, ILD,spirometry

Introduction

The cashew tree (*Anacardium occidentale*) was brought to India by Portuguese in 1500's. Today India is the largest producer and exporter of cashew kernels in the world. Cashew nut shell liquid (CSNL) is used for the preparation of resins, varnishes,paints, insecticides, wood preservatives etc.

Cashew processing is a labour intensive industry

with limited use of technology. The steps in cashew processing include roasting, shelling, peeling, grading and packing. During roasting workers are exposed to noxious fumes and smoke. Workers in shelling and peeling section are exposed to soot particles, cashew peel dust etc. Exposure to smoke,fumes and dust are well known risk factors for various lung diseases including asthma¹, COPD² and hypersensitivity pneumonitis. Very little information is available on the magnitude of lung function abnormalities in cashew factory workers.

Objectives of the study

Primary Objective

To study the spirometric abnormality in symptomatic cashew factory workers.

Secondary Objectives

1. To study the relationship between the severity of spirometric abnormality and the duration of job.
2. To study the relationship between the severity of spirometric abnormality and various job sections

Materials and Methods

Descriptive study was conducted in 10 cashew factories of Kollam district from June 2012 to December 2012. Workers from different job sections with respiratory symptoms were included in the study. This study was conducted as a survey among cashew factory workers during medical camps organized in 10 factories. A total of 5420 people were working in these 10 cashew factories. Out of this 434 workers got registered for the section of medical camp dealing with Pulmonary Medicine. Symptomatic workers were selected based on a questionnaire. Workers with diagnosed respiratory diseases like asthma, pulmonary tuberculosis, bronchiectasis, COPD, ILD before joining the cashew factories and persons with systemic diseases like cardiac disease, chronic liver diseases, chronic renal disease, and thyroid diseases were excluded from the study. So from the registered group of workers 184 were excluded, and finally 250 persons were selected for the study. All the workers were interviewed with a structured questionnaire containing socio-demographic variables, detailed occupational history, hazards involved, smoking history, respiratory symptoms and other systemic diseases. All the selected workers were subjected to spirometry with reversibility using Vitalograph as part of camp itself. Spirometry results were interpreted using ATS/ERS guideline³. Data was analysed using SPSS.11 to find out the relationship between the severity of spirometric abnormality and the duration of job and various job sections respectively after adjusting for age, gender and smoking status.

Results

250 patients were included in the study. Mean age of the study population was 47.4 years and 32% were males and 68% were females. 45 (56.25%) males were smokers. None of the females were smokers (table 1).

Table 1: Baseline characteristics of the study population

Age (mean)	47.4 yrs
Males	80(32%)
Females	170(68%)
Smoking status(males)	45 (56.25%)

Percentage distribution of the sample according to the job section is given in Table 2. 41.6% workers were from shelling section, 20% from roasting and 17.2% from peeling.

Table 2 : Distribution of the sample according to the job section

Job section	Number	Percentage
Shelling	104	41.6
Roasting	50	20.0
Peeling	43	17.2
Grading	25	10.0
Cleaning	10	4.0
Watchmen	6	2.4
Supervisor	8	3.2
Clerk	4	1.6

Mean duration of job was 19 yrs (table 3). Dust, smoke and soot were the main hazards to which workers were exposed.

Table 3: Duration of job

Duration of job (yrs)	Number	Percentage
<10	72	28.8
10-19	59	23.6
20-29	60	24.0
30-39	37	14.8
>40	22	8.8

Dyspnea (80.4%) was the most common symptom followed by cough (53.2%), allergic rhinitis (26.4%) and chest pain (4.8%). (table 4)

Table 4: Symptoms

Symptom	Number	Percentage
Dyspnoea	201	80.4
Cough	133	53.2
Allergic rhinitis	66	26.4
Chest pain	12	4.80

Spirometry showed obstructive pattern in 52.4%, restriction in 8.8% and normal pattern in 38.8% (table 5).15.2% patients had mild obstruction, 22% patients had moderate obstruction, 12.8% patients had severe obstruction and 2.4% patients had very severe obstruction. 54 (39%) patients with obstructive pattern showed reversibility to bronchodilator.

Table 5 : PFT Pattern

PFT pattern	Number	Percentage
Normal	97	38.8
Mild obstruction	38	15.2
Moderate Obstruction	55	22.0
Severe Obstruction	32	12.8
Very Severe obstruction	6	2.4
Restriction	22	8.8

Analysis of data showed that severity of spirometric abnormality had no statistically significant association with duration of job or various job sections while adjusting for age, sex and smoking status. There was no significant difference in spirometric abnormality among smokers and non smokers.

Discussion

Present study demonstrates that cashew factory workers are suffering from various respiratory symptoms like dyspnoea, cough, allergic rhinitis and chest pain. Dyspnea (80.4%) was the most common symptom in our study. Study on occupational diseases among cashew factory workers in coastal Karnataka by Ramachandra kamath showed that 11.3% of the workers were suffering from respiratory diseases⁴. In our study 61.2% of the study population had abnormal spirometry. Most common spirometric abnormality was obstructive pattern, of which 39% had reversible obstruction suggesting the possibility of asthma and 61% had non reversible obstruction suggesting the possibility of COPD. 15.2% patients had mild obstruction, 22% patients had moderate obstruction, 12.8% patients had severe obstruction and 2.4% patients had very severe obstruction. In this study there was no significant difference in airway obstruction among smokers and non smokers. This may be due to the fact that only a small portion of study population were smokers (45/250). 8.8% had restrictive pattern and 38.8% patients had normal pattern. This study identified dust, smoke and soot as main hazards in cashew processing which can cause

respiratory diseases. Limited use of technology to contain processes like roasting, poor ventilation and lack of use of personal protection devices increases the chance for inhalation of dust and smoke. Smoking among male workers may have an additive effect on lung damage caused by occupational exposure. Analysis of data showed that severity of spirometric abnormality had no statistically significant association with duration of job or various job sections while adjusting for age, sex and smoking status.

Conclusion

Cashew factory workers are suffering from various respiratory symptoms like dyspnoea, cough, allergic rhinitis and chest pain. 61.2% of the study population had abnormal spirometry and obstructive pattern was the most common abnormality. Severity of spirometric abnormality had no statistically significant association with the duration of job or different job sections.

Suggestions

Steps like use of personal protection devices, improvement in ventilation at job sections with high smoke and dust exposure and use of technology to contain processes like roasting will help to reduce the respiratory morbidity in cashew factory workers.

Limitation

Only symptomatic individuals who volunteered to get registered for the camp were included in the study and the sample size was small. A large study including asymptomatic workers may be useful to find out the deleterious effect. Further evaluation of those individuals with abnormal spirometry, especially those with restrictive pattern, is needed.

References

1. Global Initiative for Asthma (GINA).Global strategy for asthma management and prevention :6,2010.
2. Global Initiative for Chronic Obstructive Lung Disease(GOLD). Global strategy for diagnosis, management and prevention ofchronic obstructive pulmonary disease:17,2009.
3. Pellegrino R, Viegi G, Brusasco V, et al: Interpretive strategies for lung function test. Eur Respir J 26: 948-968,2005.
4. Ramachandra Kamath. Occupational diseases among cashew factory workers in south India. Malaysian Journal of Public Health Medicine. Vol.11(suppl.2);12-13 2011.