

OCCUPATIONAL RESPIRATORY ALLERGIC DISEASES AMONG WORKERS IN BAKERIES / BASRAH

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ABSTRACT

A cross-sectional comparative study was carried out to estimate the prevalence of occupational respiratory allergic diseases in bakeries in Basrah. The study was carried out on bakery workers who were exposed to flour dust during work and compared with non exposed group. The study involved 68 bakery workers and 68 comprise group. A special questionnaire was used for the purpose of the study. The results showed that the prevalence of work-related respiratory allergic condition as reported by workers and diagnosed by the investigator was significantly higher among the exposed group than that in the comparison group. Safety measures are highly recommended in such type of work conditions.

INTRODUCTION

A strong awareness has grown of the effects of environmental air pollution on the human respiratory tract. Increase in bronchitis, chronic cough and asthma among the population has been recorded with exposure to pollutants at levels even below standard international levels.^[1] Material inhaled in the workplace can lead to all the major chronic lung diseases except those due to vascular disease.^[2] Respiratory disease in bakers has been known since the days of ancient Rome.^[3] In 1700 Bernardo Ramazzini described respiratory symptoms among bakers caused by exposure to flour dust.^[4] De Besche in 1929, introduced the idea of baker's asthma as an allergic occupational disease.^[3] Baker's asthma and rhinitis are the most prevalent occupational health problems in several countries,^[4,5] it formed the second most prevalent cause of occupational asthma in UK, according to surveillance of work related and occupational respiratory disease.^[6] In Basrah, several studies on occupational allergic diseases were carried out,^[7,8] specifically about allergic sensitization in flour industry,^[9] however none of them involved workers in small bakeries. Therefore, the present study was carried out to study the association between exposure to flour dust and development of occupational respiratory allergic diseases among the workers in small bakeries.

SUBJECTS AND METHODS

A cross-sectional comparative study was performed during 2007, involving 68 bakery workers from 20 small bakeries in Basrah city center (all workers with three months or more

experience in the bakery were asked to participate), and 68 non-exposed workers from shops next to bakeries as (comparison group). All the persons included in the study were males. An informed consent was obtained from all subjects before conducting the study, all of them agreed to participate in the study. A special questionnaire was used for the purpose of study, which covered items related to personal and family history of allergy, smoking status and occupational history. Smokers were defined as those currently smoking or who had stopped smoking within the last 12 months. The questionnaire also covered nasal, upper and lower respiratory symptoms and their relationship to work and leisure activities. Respiratory symptoms were defined as shortness of breath, wheeze, chest tightness, cough and sputum, while nasal symptoms were defined as sneezing, and runny nose. The questionnaire was filled through direct interview. Then each participant was clinically examined by the author himself for any sign of respiratory allergic diseases. The clinical examination was done two hours after starting work. Chi-squared test was used to determine association between different variables and P 0.05 was considered to be statistically significant.

RESULTS

A total of 136 workers were included in this study, 68 bakers (who were exposed to flour dust in the workplace), compared to 68 workers who were not exposed to such hazard as a comparison group. All workers included in this study were males, with a mean age for bakery workers 32.1 years, while the mean age for

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comparison group was 33.2 years. There were no significant differences between the two groups regarding family history of atopy and smoking habit. (Table-1)

Table 1. Characteristics of the study population

	Total No.	Age X±SD (Years)	Family history of atopy*		Smoking habit	
			No.	%	No.	%
Study group	68	32.1 ± 7.6	12	17.6	23	33.8
Comparison group	68	33.2 ± 6.2	19	27.9	14	20.6
P – Value			NS		NS	

*Have definite family history of asthma, hay fever, or eczema.

The study shows that the overall prevalence of respiratory allergic symptoms in bakery workers was 51% (who reported to have one or more respiratory allergic symptoms), compared to 26% of comparison group. The majority of symptomatic exposed group (86%) mentioned that the respiratory allergic symptoms increase on starting work and improve after leaving the workplace, while none of the comparison group mentioned such changes with their works. (Table-2) Cough as one symptom of respiratory allergy was reported by 85.7% of the 35 symptomatic bakery workers, of which 60%

had it with phlegm and the rest had a dry cough, and out of 35 symptomatic bakery workers surveyed, only 14.3% suffered from breathlessness, of whom 66% along with wheeze. (Table-3) Furthermore, this study shows that the overall prevalence of rhinitis symptoms in bakery workers are higher than that in comparison group, (62% & 14% respectively) and this difference was statistically significant. (Table-2) Sneezing, runny nose and watery eyes were reported by 54.8% and 45.2% of 42 bakery workers with rhinitis symptoms respectively. (Table-3)

Table 2. Prevalence of respiratory allergic symptoms among bakery workers.

Variables		Study group Total No.= 68		Comparison group Total No.= 68		P-value
		No.	%	No.	%	
Respiratory symptoms	Positive	35	51	18	26	0.01
	Negative	33	49	50	74	
Rhinitis	Positive	42	62	9	14	0.01
	Negative	26	38	59	86	

Table 3. The distribution of respiratory allergic symptoms among bakery work.

Variables		Bakers with respiratory symptoms (35)	
		No.	%
Respiratory symptoms	Cough	30	85.7
	Shortness of breath	5	14.3
Rhinitis	Sneezing	23	54.8
	Runny nose & watery eyes	19	45.2

Duration of work in years was found to be an important epidemiological factor that influence the allergic symptoms. Bakery workers with duration of more than 5 years reported a higher prevalence of respiratory symptoms (76.3%) than those workers with equal or less than 5 years (20%), and this difference was statistically significant (P-value = 0.00). While no significant association was found with positive family history of atopy, nor with tobacco smoking. (Table-4)

Table 4. Prevalence of work-related respiratory allergic disorders among bakery workers according to selected risk factors.

Risk Factors		Total No.	% With symptoms	P-value
Years of work	5	30	20.0	0.00
	> 5	38	76.3	
Family history of atopy	+ ve	12	66.7	NS
	- ve	56	48.2	
Smoking habit	+ ve	23	52.2	NS
	- ve	45	51.1	

A significant and markedly higher percentage of bakery workers as compared to comparison group showed positive physical sign of respiratory allergic conditions (49% and 26% respectively). (Table-5)

Table 5. The distribution of the bakery workers and comparison group according to presence or absence of physical signs.

Variables		Bakery workers Total No.= 68		Comparison group Total No.= 68		P-value
		No.	%	No.	%	
Respiratory Examination	Positive	33	49	18	26	0.01
	Negative	35	51	50	74	
Nasal Examination	Positive	22	32	9	13	0.01
	Negative	46	68	59	87	

DISCUSSION

Bakers asthma is one of the most common forms of occupational asthma in several countries.^[4] From the 1930s on ward there was a number of cross-sectional studies surveying populations of bakers, unfortunately many of them were uncontrolled-that is without comparing the bakers with un exposed group.^[4] To compensate for that deficiency we chose a cross sectional comparative study to study the association between occupational respiratory allergic diseases & bakery. Flour dust is an asthmagen and is known to cause sensitization, allergic rhinitis and occupational asthma among bakers and millers.^[10] The present study has shown that exposure to flour dust in bakeries in Basrah city is associated with increased risk of respiratory symptoms, and the prevalence of work related respiratory allergic symptoms among bakery workers was 51%, and this result goes with a previous study done in Basrah flour mills.^[9] The harmful respiratory effects of the flour dust are well documented and are believed to result from wheat flour proteins including albumins and globulins, flour parasites and added enzymes.^[11] In the Netherlands, over 10000 workers in bakeries, flour mills and baking ingredient procedures were studied. The prevalence of respiratory symptoms among workers exposed to flour was reported to be as high as 60%.^[12] In Iran, a study was done to study the pulmonary function test and work related respiratory and allergic symptoms in Iranian bakeries, the study revealed that allergic respiratory

symptoms were significantly higher in bakers than the control group.^[13] Many of the causative agents of occupational asthma are capable of inducing occupational rhinitis.^[14] So that, patients with occupational asthma frequently report symptoms of occupational rhinitis, rhinitis may start before asthma. Among Canadian patients with occupational asthma, symptoms of rhinitis were reported as 92%.^[15] In the present study, the prevalence of allergic rhinitis was reported in 62% of bakers. The symptoms of 86% of the bakers with allergic respiratory disorders increased at starting work days and improved during weekend and holidays, and this is a good indication of work-related symptoms. The study also found that the longer the duration of working as a baker, the higher the prevalence of allergic respiratory symptoms, and this finding is similar to that reported in other studies.^[1,16] Several studies have sought to assess the importance of atopy as a marker of susceptibility to occupational respiratory diseases, but a fundamental problem is the lack of agreed criteria to define atopy. Two broad definitions of atopy are principally used, based on personal history of allergy and on positive skin prick test to common environmental allergens.^[17] Our study depends on the first definition of atopy, the study showed that the family and personal history of atopy of allergy did not seem to influence the prevalence of these symptoms, this result goes with study done in India, which showed that the hereditary

factors (atopy) did not influence the incidence of respiratory symptoms in examined workers.^[1] Furthermore, the present study showed that there was no evidence of significant association between respiratory allergic symptoms and tobacco smoking, and this is in keeping with results reported in a study done in Spain.^[18]

In conclusion: this study showed a high prevalence of occupational respiratory allergic diseases among bakers employed in small bakeries. Application of safety measures may reduce the effect.

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