

Evaluating of Oral Cleanliness and Gingival Health Conditions of Two Specific Groups of Workers in Karbala City

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Abstract: *Background:* Work environment has a direct effect on general as well as oral cleanliness and gingival health conditions. Bakery industry deals primarily with flour which may affect the oral cleanliness and gingival health conditions of workers. *Aim of study:* To assess and compare oral cleanliness and gingival health conditions (PII, CAI and GI) of groups of workers producing bakery products, and control group of workers not concerned with flour. *Materials and methods:* Study group consisted of thirty bakery workers in Karbala city. A matching control group of thirty workers in non-production lines in the same factories were selected. Plaque index of Silness and Loe, calculus index of Ramfjord, and gingival index of Loe and Silness were used for recording oral hygiene status. *Results:* The finding revealed that the bakery group had higher mean values of plaque and calculus and gingival indices than the control group with statistically non-significant differences. *Conclusion:* This study showed that bakery workers had higher levels of gingivitis, dental plaque and calculus. It was assumed that these findings were attributed to closer exposure of flour dust in addition to the low education.

Keywords: oral cleanliness, gingival health, workers, wheat flour dust.

1. Introduction

The bakery industry is about making varieties of breads, cookies, cakes and pastries, and it's called, bakers' confections, also called flour confections [1]. The main ingredients in this industry are wheat flour [2]. An occupation associated disease can be defined as any negative change in the health state of an individual resulting directly from persistent exposure to a harmful substance or condition related to his/her work [3,4]. Studies have shown that workers who are in regular contact with flour dust are at an increased risk of periodontal diseases, and had emphasized the need for special precautions to maintain oral health and prevent oral injuries [5,6]. This study was designed to investigate the effects of flour dust on oral hygiene status among confectionery workers in Karbala city.

2. Materials and methods

Sixty subjects (30 bakery workers and 30 control) in bakery factories in Karbala city included in this study. The gender depended males only, age between 21-40 years, and only employers who had spent at least 3 years in their work were included. The control group was chosen from workers not employed on production units in an environment not directly associated with flour in the same factories. All subjects had matching age, gender, work hours, education level and socioeconomic status. All the subjects were healthy with no history of serious medical problems, and were not receiving any medicaments, and not wear any fixed, removable dental prosthesis or orthodontics appliance.

Examinations were carried out in the factories in the morning, and a portable electric light source was used for illumination during examination. Each worker was seated on

a chair with a tall back rest and the examiner behind worker's head. Examination was performed using a disposable plane dental mirror and explorer. A tooth was considered present in the oral cavity when any part of it was visible or could be touched by the tip of the explorer without excessively displace soft tissue. Plaque Index (Silness and Loe, 1964) system was used. The examination was started with buccal surface followed by mesial, lingual and distal surfaces of teeth examined. Dental calculus was assessed according to the calculus criteria of the periodontal disease index (PDI) by Ramfjord (1959). Gingival inflammation was assessed by using the gingival index by Loe and Silness (1963). The same teeth of the (PII) were examined and the sequence of examination was similar to the (PII).

3. Results

Table (1) illustrates the mean values and standard deviations of plaque index in bakery group higher than control group (0.839 ± 0.064 , 0.702 ± 0.062 respectively) with non-significant difference ($p > 0.05$), and for calculus index the mean values and standard deviation for bakery group higher than control group (0.295 ± 0.056 , 0.123 ± 0.026 respectively) with non-significant difference ($p > 0.05$). Table (2) shows the mean values and standard deviations of gingival index for bakery group higher than control group ($.491 \pm .065$, $.327 \pm .059$ respectively) with non-significant difference ($p > 0.05$).

Table 1: Descriptive and statistical test of oral health cleanliness among group

Variables	Groups	Mean	±SE	F	df	P-value
PLI	Control	0.702	0.062	2.227	3	0.089 NS
	Bakery	0.839	0.064			
	Total	0.811	0.030			
CAL	Control	0.123	0.026	2.079	3	0.107 NS
	Bakery	0.295	0.056			
	Total	0.224	0.025			

NS=Not significant at P>0.0

Table 2: Descriptive and statistical test of GI among groups

Groups	Mean	±SE	F	df	P-value
Control	.327	.059	5.055	3	0.078 NS
Bakery	.491	.065			
Total	.460	.031			

NS=highly significant at P>0.05

The distribution of the gingival inflammation according to the severity is shown in Table (3). The prevalence of gingivitis was 92.5% in both bakery and control groups. Mild gingivitis was the most prevalent type among the bakery and control groups, whereas in both groups no severe gingivitis case was recorded.

Table 3: Distributions of gingival inflammation according to severity between groups

Groups		GI severity		
		Healthy	Mild	Moderate
Control	NO.	6	22	2
	% GI	66.67	21.15	28.57
	% groups	20.00	73.33	6.67
	% T	5.00	18.33	1.67
Bakery	NO.	3	25	2
	% GI	33.33	24.04	28.57
	% groups	10.00	83.33	6.67
	% T	2.50	20.83	1.67
Total	NO.	9	104	7
	% GI	100.00	100.00	100.00
	% groups	7.50	86.67	5.83
	% T	7.50	86.67	5.83

4. Discussion

The present study revealed higher mean values of plaque and calculus indices in bakery workers than control group, however the difference was statistically non-significant. It is assumed that workers usually neglect oral care measures during working hours [7,8] therefore plaque and deposits accumulate on their teeth. In this study, the levels of plaque and calculus of the bakery group were higher than those of control group, and these differences between them could be explained by accumulation of more plaque induced by high level of flour dust [6,9,10]. Similarly, bakery workers had insignificantly higher levels of gingivitis. Similar findings were reported by Bachanek^{5,6} who evaluated the dental health status of mill workers and stated that they have more gingivitis than a control group. While Masalin⁹ stated that there was no statistically significant difference regarding periodontal status between bakery and control groups in Finland. This disagreement could be attributed to the work hygiene measurements followed among the Finnish population. The higher levels of gingival inflammation revealed in this study reflect the fact that dental diseases in

general are very common among workers. Gingivitis is a nonspecific inflammatory response to dental plaque around the gingival margin [11,12]. This may explain the 86% of gingivitis recorded in all groups. Another explanation for the higher mean value of gingival index among bakery group than the control group may be presented by the fact that foods with a higher content of flour were cleared slower from the mouth than other types of food contents [10].

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