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PREVALENCE OF CONTACT DERMATITIS AMONG EMPLOYEES IN FALLOJA CEMENT PLANT

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Key words: Contact dermatitis, cement.

معدل الإصابة بالحساسية التلامسية بين عمال الاسمنت في معمل سميت الفلوجة

الخلاصة:

اجري بحث ميداني على العمال المذكور لمعمل سميت الفلوجة لقياس نسبة الإصابة بالتهاب الجلد التلامسي بين العمال ولدراسة مدى تأثير طول فترة العمل (فترة التعرض للاسمنت) أو العمل في مختلف الاقسام على نسبة الإصابة بالتهاب الجلد التلامسي. شارك في الدراسة 253 فرد من اصل 278 عامل. وقد بينت الدراسة أن 13% (33/253) من العمال مصابون بالتهاب الجلد التلامسي. كما وجد ان هناك علاقة طردية إحصائية بين الزيادة في احتمال الإصابة مع طول فترة العمل وكانت القيمة المعنوية لهذه العلاقة أقل من 0.05. وظهر ان أعلى نسبة من المصابين بالتهاب الجلد التلامسي هوبين العمال العاملين في قسمي التغليف والادامة مقارنة بالاقسام الأخرى وكانت القيمة المعنوية لهذه العلاقة أقل من 0.05.

SUMMARY:

A cross-sectional survey was conducted on employees of Falloja Cement Plant to measure the prevalence of contact dermatitis, and to evaluate the effect of duration of work and working in different departments on the development of contact dermatitis among the employees. Out of 278 workers, 253 persons (91.0%) participated in the study. The overall prevalence of contact dermatitis is 13.0% (33/253). Prevalence of contact dermatitis was found to be proportionally related with duration of work ($P < 0.05$). Working in packing house was associated with a high prevalence of contact dermatitis (26.6%) compared to working in other departments ($P < 0.05$).

INTRODUCTION:

Occupational dermatitis defined by Donald⁽¹⁾ as "any abnormality of the skin induced or aggravated by the work environment"; Solomons⁽²⁾ defined it as "condition characterized by redness, oedema, vesicles and sometimes bullae and a variable amount of itching". Goh⁽³⁾ stated that "cement dermatitis must be considered in all patients working with cement regardless of the pattern of their eczema".

Prevalence of cement dermatitis was found to be increased with increasing urbanization⁽⁴⁾. In Switzerland the prevalence of cement dermatitis increased, parallel with expansion of cement work, from (30.8%) in 1951 to (40.3%) in 1959. In France cement dermatitis

constituted 20-25% of all occupational dermatitis in 1957, and 33.0% in 1966. In Kuwait 12% of occupational dermatitis was due to cement exposure^(4,5).

Climatic factors such as high humidity and temperature are important predisposing factors in the development of cement dermatitis⁽⁶⁾.

We are aiming at evaluating the effect of duration of work on prevalence of contact dermatitis among workers in different departments.

MATERIALS AND METHODS:

This cross-sectional survey was conducted throughout July 1988, on male employees of Falloja Cement plant. Out of 278 persons working in the plant at the time of conducting the study, 253 subjects (91.0%) participated in the study. Records of 25 workers were dropped because they did not complete the questionnaire.

Special questionnaire has been developed by the research team. It contains information regarding age, duration of employment, department of work, presence and location of contact dermatitis as well as previous history of contact dermatitis. The questionnaire was administered by a physician (Alrawi) who had training at the Dermatology Section, Medical City in recognition and diagnosis of dermatitis.

Subjects with erythema, vesiculation, craking, fissuring or lichenification of the skin were considered having contact dermatitis.

Employees who had history of any abnormal skin lesions prior to joining the workforce were not included in the study group.

Statistical tools used are: chi-square test for slope (b), chi-square test for linearity to test linear relationship between duration of work and prevalence of contact dermatitis and chi-square test for trend (X^2 Bartholomew) to test the difference in the proportion of contact dermatitis among subjects working in different departments⁽⁷⁾.

RESULTS:

Mean age (in years) of the study group is 35.4 ± 2.4 . The overall prevalence of contact dermatitis is 13.04% (33/278).

Table 1 presents the distribution of contact dermatitis by site of the body affected. The areas affected the most are hands (75.75%) followed by forearms (66.6%), feet, chest and face and neck.

The relationship between presence of contact dermatitis and duration of work is illustrated in Table 2. A statistically significant linear relationship was found between prevalence of contact dermatitis and duration of work, ($P < 0.05$). The findings suggests also a statistically significant increase in prevalence of

Table 1- Distribution of Cement Dermatitis by Site Affected*

Site Affected	No.	%
Hands	25	75.75
Forearms	20	60.6
Feet	19	57.57
Chest	13	39.4
Face and neck	12	36.36
Others	4	12.12

*Number of workers with contact dermatitis is 33, but most of the workers had more than one site affected.

Table 2- Contact Dermatitis by Duration of work

Duration of work in years	Contact dermatitis			P (D/F)* %
	Present	Absent	Total	
1- 4	9	128	137	0.065
5- 8	3	23	26	0.110
9-12	7	29	36	0.190
13-16	4	15	19	0.210
17-20	3	9	12	0.250
21-24	4	10	14	0.280
25-28	3	4	7	0.430
29-32	0	2	2	0. 0
Total	33	220	253	0. 13

X^2 slope = 13.7
 d.f. = 1
 $P < 0.01$

X^2 linearity = 17.9
 d.f. = 6
 $P < 0.01$

* Probability of disease (contact dermatitis) giving the factor present (cement exposure).

Table 3- Contact Dermatitis by Department of work

Department of work	Contact dermatitis			P (D/F)* %
	Present	Absent	Total	
Packing house	4	11	15	26.6
Maintenance Dept.	15	52	67	22.9
Service Department	4	20	24	16.6
Production Dept.	10	104	114	8.7
Work shop	0	21	21	0.0
Laboratory	0	12	12	0.0
Total	33	220	253	13.0

* Probability of disease (contact dermatitis) giving the factor present (cement exposure).

X^2_B For trend = 19.49

$P < 0.05$

Special tables and formulae are used to find the P-values?

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contact dermatitis with increase in duration of employment; i.e. where the slope is positive and significantly different from zero, ($P < 0.05$).

The effect of working in different departments on prevalence of contact dermatitis is illustrated in Table 3. Prevalence of contact dermatitis is the highest among subjects working in packing house (26.6%) followed by those working in maintenance department (22.9%), service department (16.6%) and production department (8.7%). A statistically significant trend of increase in development of contact dermatitis was found by working in different departments, ($P < 0.05$). The results suggest that packing house and maintenance department are the most hazardous working areas.

DISCUSSION:

The results revealed that hands are the most affected areas compared with other exposed areas. This could be explained by the fact that cement workers are either not wearing protective gloves or clothes or using them improperly, where cement dust could pass through. The layer of cement dust that formed on skin get wet by perspiration and induced its burning effects. The burning effect of cement is due to its high alkalinity (PH more than 12.3) which depends on the content of lime (calcium hydroxide) or presence of chromium^(8,9,10,11). The overall prevalence of contact dermatitis is 13.04%. Goh et al, 1986⁽¹²⁾ reported similar results among employees of a prefabrication construction factory.

No evidence of selection bias was demonstrated when interpreting results of the study, because we decided to include all the workers in the plant, the participation rate is 91.0% and the workers were blind to the aims of the study. However, studying data of Table

2 indicates presence of survival bias (where sensitive or diseased workers have left the workforce) which is an inherent character of all cross-sectional studies⁽¹³⁾. But, the findings of the study indicate that the main effect of survival bias (dilution the effect of the factor under study, cement exposure)^(14,15) does not play an important role, where the prevalence of contact dermatitis was found to be increased with increases of duration of work.

The higher prevalence of contact dermatitis among employees of packing house and maintenance department illustrates the effect of high pollution of the local environment in these departments as demonstrated by personal inspection. Contrary to what it is expected, the prevalence of contact dermatitis was found to be the lowest in production department where crushing of stones and mixing of klinker with gypsum takes place with production of tremendous amount of dust and pollution. This could be explained by the fact that these operations are mechanically controlled from an outside control area and the raw materials have not been processed yet to gain cement characteristics.

To conclude, the findings of this study ascertain the hypothesis that there is a direct positive relationship between development of contact dermatitis, cement exposure and duration of work. This study, to the best of our knowledge, is the first in the country that deals with such a problem therefore, we could not compare our results with those of another Iraqi study. We recommend another study to be done with inclusion of live control group and another study to be done later in time on the same population to confirm our findings, utilizing the fact that carrying two cross-sectional studies on the same population in two different times is equal in its epidemiological value to a prospective study⁽¹³⁾.

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Part Two: ICMS Activities

1. Topics of the Issue: 1. Community Medicine: K. Demichiel
2. Activities of members of society

تشرة منظمة الصحة العالمية الاسبوعية تعلق على البحث الموسوم «الكزاز الولادي في منطقة بغداد - دراسة وبائية»

حلفت منظمة الصحة العالمية في تقريرها الوبائي الاسبوعي العدد ٩ السنة ٦٤ في ١٩٨٩/٣/٣
على البحث اعلاه تحت عنوان.

Expanded Programme Immunization - Hospital based study on neonatal tetanus

والذي قام به كل من د. بني الخوري، د. عامر صادق، أ. د. حكمت جميل والمنشور في
مجلة طب المجتمع مجلد (١) العدد (٢) لعام ١٩٨٨ ص ٧٩ - ٨٧
ونظراً لأهمية التعليق ندرجه نصاً.

EDITORIAL NOTE: This report is of special interest as an example of the proper use of hospital-based data on neonatal tetanus to collect information on the epidemiological pattern of the disease and to assess the impact of the immunization programme on NT incidence. The Ibn-El-Khateeb Hospital is the only hospital for infectious disease in Baghdad area and most cases of tetanus from that area are hospitalized there.

The data from IKHB confirm the downward trend in the incidence of all EPI diseases, including tetanus, observed in the routine re-

porting system for 1985 and 1986.¹ Hospital data, like routine reporting data, showed that more than 80% of hospitalized cases of tetanus were due to neonatal tetanus.

The survey conducted in April 1987 showed that the coverage with 2 doses of tetanus toxoid in women of childbearing age was 43%. In order to have a more accentuated decline of neonatal tetanus incidence, further efforts are needed to increase tetanus toxoid immunization coverage in women of childbearing age.