

The Frequency of Skin Diseases among Smokers Compared with that of the Non-Smokers Individuals

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Abstract:

Background: It is well-known that smoking has hazardous effect on many systems like pulmonary and cardiovascular systems. Also cigarette smoke might affect the skin causing change in patterns of skin diseases.

Objectives: The aim of present work is to study the frequency & pattern of skin diseases among smokers and non smokers.

Patients & Methods: A cross-sectional study of analytic component was conducted in the out patient clinic of Dermatology and Venereology, Baghdad Teaching Hospital in the period extending from April 2002 through October 2003. A total of 900 male patients age matched smokers and non-smokers with various skin disease were studied, (452 smokers, 448 non-smokers). Full dermatological & clinical examination was done to establish the correct diagnosis of skin disease.

Results: The present work had shown that many skin diseases were significantly more frequent among smokers than non-smokers with ($P=0.045-0.003$, $OR=1.69-2.26$) like skin infections, psoriasis, palmoplantar pustulosis, cystic and keloidal acne, scabies and warts. Other diseases such as acne vulgaris, oral aphthous ulceration, vitiligo and pityriasis rosea, showed lower frequency rate among smokers compared with non-smokers, ($P=0.044 - 0.01$).

Conclusion: Cigarette smoking is an important preventable and an associated factor of many skin diseases.

Keywords: Skin disease, Smokers, Non-smoker,

Introduction

It is well-known that smoking has hazardous effect on many systems like pulmonary and cardiovascular system^[1,2,3]. Also cigarette smoking might affect the pattern and frequency of skin disease and premature aging and facial wrinkles^[4-7].

The aim of the present work is to study the frequency of skin diseases among smokers compared with non smokers.

Patients & Methods:

The study includes 900 patients with various skin disorders, taken from outpatient clinic of Dermatology and Venereology in Baghdad Teaching Hospital in the period from April 2002 through October 2003. All patients included in this study were aged 20 years old or more. The design of study is cross-sectional with analytic component including all attendants to the outpatient of Dermatology & Venereology during that period.

(Table -1)The distribution of smoker by their pack-year smoking

Cigarette smoking (Pack-year)	Smoking type	No.	%
(≤ 5)	Mild	70	15.45
(6-10)	Moderate	137	30.32
(≥11)	heavy	245	54.2
Total	3 Groups	452	100

Inclusion criteria were cigarette smoker only. Whereas exclusion criteria included; pipe, shisha smokers, ex-smokers, alcoholic and chronic drug abuser, patients with chronic medical, surgical and dermatological disorders like genodermatosis,

Table (3): The frequency distribution of skin disorders among the entire examined group (smoker and non smokers)

A detailed history from each patient was recorded regarding the following points; age, sex, birthplace, residence & occupation, (current and past), with an attempt to classify it as mainly outdoor (> 8hr/day or indoor (< 2hr/day) or combined 2-8 hours those patients were excluded from the study^[5].

Smoking habit was measured according to the National Heart, Lung, and Blood Institute. Pack-years were calculated by multiplying the duration of smoking (years) by the reported average number of cigarettes smoked per day during this period, divided by 20 to convert it from cigarettes to packs.^[8, 9] Smoking habits classified into 3 types according to its severity (pack/years) into mild, moderate and heavy (Table 1).

A full dermatological and clinical examination was done to establish the correct diagnosis of skin diseases.

metabolic abnormalities, abnormalities of dermal connective tissue and skin tumors were also excluded.

Statistical analysis was performed using chi square test (χ^2), P-value of ≤ 0.05 as significance level cut off.

No.	Diseases	Non-smoker No.	%	Smoker No %	Tot al	χ^2	P- Value	Odd ratio	
1	Skin infection	13	2.9	34	7.52	47	8.7	0.003	2.56
2	Acne vulgaris	31	6.91	14	3.1	45	6.26	0.01	0.45
3	Cystic and Keloidal acne	1	0.22	10	2.21	11	5.66	0.01	9.91*
4	Scabies	9	2	22	4.86	31	5.16	0.02	2.42
5	Herpes zoster virus	3	0.66	6	1.32	9			
6	Herpes simplex virus	7	1.56	-	-	7			
7	Warts	27	6.02	54	11.94	79	7.08	0.007	1.91
8	Candida	8	1.78	1	0.22	9			
9	Dermatophyte	12	2.67	20	4.42	32	1.86	0.17	1.65
10	Rosacea	5	1.11	-	-	5			
11	Erythrasma	-	-	6	1.32	6			
12	Paronychia	6	1.33	1	0.22	7			
13	Tinea versicolor	42	9.37	31	6.85	73			
14	Skin tag, Corn, Fissuring..etc.	31	6.91	17	3.76	48	4	0.045	0.54
15	Melasma	8	1.78	2	0.44	10			
16	Recurrent oral ulceration	15	3.34	5	1.1	20	4.02	0.044	0.33*
17	Dermatitis herpetiformis	-	-	4	0.88	4			
18	Alopecia areata	24	5.35	14	3.1	38	2.61	0.106	0.58
19	Vitiligo	15	3.34	4	0.88	19	5.22	0.022	0.26*
20	Hair loss	3	0.66	8	1.76	11	1.39	0.237	2.64*
21	Psoriasis	24	5.35	41	9.07	65	4	0.045	1.69
22	Palmoplantar Pustulosis	1	0.22	6	1.32	7	2.22	0.135	5.95*
23	Dermatitis	62	13.8	70	15.48	132			
24	Urticaria	22	4.9	12	2.65	34			
25	Erythema multiforme	3	0.66	12	2.65	15			
26	Prurigo simplex	7	1.56	4	0.88	11			
27	Seborrheic dermatitis	12	2.67	6	1.32	18	2.9	0.155	0.5
28	Pruritus	11	2.45	17	3.76	28			
29	Miliaria	8	1.78	3	0.66	11			
30	Intertrigo	21	4.68	6	1.32	27	8.22	0.004	0.28
31	Insect bite	3	0.66	7	1.54	10			
32	Fixed drug eruption	3	0.66	6	1.32	9			
34	Pityriasis Rosea	11	2.45	3	0.66	14	4.57	0.03	0.27
35	Lichen planus	8	1.78	2	0.44	10			
36	Polymorph light eruption	2	0.44	4	0.88	6			
TOTAL		448	49.7	452	50.23	900			

* Yates corrected test

Results:

The study included 900 age-matched males with various skin problems, 452 smokers with age range 20-80 mean \pm SD (36.28 \pm 12.56) years. While 448 non-smokers 20-70 mean \pm SD (37.25 \pm 12.21) years (P>0.05)

The frequency of skin diseases among smokers and nonsmokers was shown in (Table 3), the following diseases were significantly more frequent among smoker than non-smoker (P <0.05) like skin infection, cystic & keloidal acne, scabies, warts, psoriasis and palmoplantar pustulosis.

Other diseases like acne, oral aphthosis, vitiligo, alopecia areata and pityriasis rosea; showed lower frequency rate among smokers compared with non-smokers (P< 0.05). The relationship between the frequency of some skin diseases and severity of smoking by pack-years like skin infection, cystic and keloidal acne, scabies, and psoriasis and palmoplantar pustulosis was statistically significant. While other diseases the frequency was negatively associated with the severity of smoking like vitiligo, acne vulgaris and oral aphthosis (Table 4).

Table (4).The Frequency Distribution of Common Skin Diseases by their Pack- Year among Smokers only.

<i>Severity of smoking, by packs-year</i>							
	Skin diseases	Mild (≤ 5)	Moderate (6-10)	Heavy (≥ 11)	Total	χ^2	P
1.	Skin infection	3	16	15	34	7.76	0.02
2.	Acne	4	8	2	14	2.92	0.231
3.	Cystic acne	1	5	4	10	2.14	0.34
4.	Scabies	2	9	11	22	5.05	0.08
5.	Warts	19	22	13	52	1.78	0.41
6.	Psoriasis	2	8	31	41	23.98	0.00001
7.	Palmo plantor pustulosis	0	1	5	6	4.88	0.087
8.	Dermatophyte	4	9	7	20	1.46	0.4808
9.	Intertrigo	1	1	4	6	2.06	0.357
10.	Oral ulcer	3	2	0	5	2.38	0.30
11.	Alopecia areata	1	6	7	14	3.73	0.154
12.	Vitiligo	2	1	1	4	0.36	0.83
13.	Pityriasis Rosea	1	2	0	3	1.6	0.449
14.	Hair loss	0	4	4	8	3.56	0.169
15.	Seborrh dermatitis	0	1	5	6	4.88	0.087
Total No.		43	95	109	247		
Total %		17.4 3%	38.43 %	44.14%			

The frequency distribution of common skin diseases by their pack-years was most common in heavy smoking

Discussion:

The present study showed the negative and positive effect of smoking on some skin diseases. There was a significant association between smoking and skin infection. Smoker group showed increase in frequency of bacterial infection (72.34% Vs 27.66%) $P=0.003$, viral wart (65.82% Vs 34.18%) $P=0.007$, and scabies (70.96% Vs 34.18%), $P=0.02$. This possibly reflects the negative effect of smoking on impairment of cell-mediated & humoral immunity through decreasing natural killer cells, disturbing function of T & B-lymphocytes and lower smoker's serum IgG, IgA.^(10, 11) Furthermore, the acute & prolonged ischemic effects of smoking, that result in diminished nutritional supplementations. An additional factor like the anti-antioxidant effect of smoking and the decrease in the serum levels of vitamin A & C, α & β -carotene in smoker's serum.⁽¹²⁾, this indirectly leads to diminishing the resistance to infection.

In consistency with previous studies, we also found not only a significant association between smoking

group 46.9% then moderate 36.74% and less in mild group 16.28%.

and psoriasis ($P=0.045$), but also very strong association between smoking and palmo-plantar pustulosis (85.71% Vs 14.29%). This also explains the presence of psoriasis & palmo-plantar pustulosis at later extremes of life in smokers than nonsmokers. The incidence of both diseases was increased with more pack-years smoking so heavy smoking subjects were more liable to get psoriasis. This explains that the smoker psoriatic patient had earlier age of onset, more chronic disease and less response to treatment by finding the continuation of disease to elder ages. These results were similar to two previous Iraqi studies.⁽¹³⁾ The first study showed that smoking habit (45% Vs 27%) of patients with psoriasis, compared with their age and sex matched controls. The onset of smoking habits had preceded appearance of psoriasis in 39%.⁽¹³⁾ The second one showed there was a significant association between psoriasis and smoking prior to the onset of the disease while after the onset there was no significant association⁽¹⁴⁾. The possible

cause is that smoking is associated with increase in abnormality, morphology & function of leukocytes in smokers blood which lead to liberation of proteolytic & proinflammatory mediators that result in initiation & increase in the severity of psoriasis & palmoplantar pustulosis^(14,15).

This explains the molecular basis and the biochemical mechanisms for premature skin aging in smokers, compared with nonsmokers, a possibility resulting from:

1. Smoking associated with increased in elastosis change in the skin^(16,17).
2. Decrease in collagen synthesis of dermis⁽⁶⁾.
3. Increase plasma neutrophil elastase activity⁽¹⁸⁾.
4. Chronic ischemia of the dermis⁽⁶⁾.
5. Decrease in Vit.A, Vit.C, α -& β -carotene and hence decrease protection against free radicals^(12,19).
6. Decrease skin stratum corneum moisture⁽⁶⁾.
7. Increase in the hydroxylation of estradiol which leads to relative hypoestrogenic state especially in women in postmenopausal period, that may cause atrophy, and dryness of skin^(10,19).
8. Smoking induces matrix metalloproteinase enzymes, which leads to degradation of collagen⁽²⁰⁻²³⁾.

On the other hand, there were some skin diseases like vitiligo and alopecia areata were less in smokers compared with nonsmokers & this might be explained by that these diseases had some sort of autoimmune pathogenesis. Also most of patients with these diseases had history of psychological trauma or stressful condition as a predisposing factor for triggering these diseases. Subsequently, smoker patients usually alleviate the depressive mood & anxiety state by smoking more cigarettes. In addition, cigarette smoking may disturb the immunity in patients with these diseases who have already disturbed immunity that may lead to decreased incidence of these diseases in smokers. However the emotional stress of some skin diseases & its disfiguring effect on skin may precipitates the smoking habits in some patients & this will be negatively correlated with the course of the disease.

From the previous studies, the beneficial anti-inflammatory effect of nicotine on some inflammatory diseases such as ulcerative colitis & pyoderma gangrenosum had been well known⁽²⁴⁻²⁶⁾. In the present study similarly we found a decrease in the frequency of oral aphthous ulceration (25% Vs 75%) $P=0.044$, acne vulgaris (31.1% Vs 68.9%) with $P=0.01$ pityriasis rosea, (21.42% Vs 78.58%) $P=0.03$, seborrheic dermatitis (33.3% Vs 66.7%) $P=0.15$, in smokers compared with nonsmokers, which may be due to nicotine content in cigarette smoking. So we can change the tobacco smoking habit by other ways for the treatment of these diseases by delivering nicotine to the skin by transdermal route, spray, cream, lotion & ointment to decrease the systemic toxic & addictive effect of smoking tobacco.

However, smoking may have some beneficial effects in certain dermatological diseases such as oral aphthosis.

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