Skin Cancers and Wrinkling Score

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Abstract

Background: There are many risk factors that accentuate wrinkling like age, sex, occupation and smoking, from clinical observation noticed that patients with high wrinkling scores were less liable to develop skin cancers.

Objectives: Study severity of wrinkling among cases of skin cancers by age groups, smoking, outdoor environment factors and type of skin cancers.

Patients & Methods: A cross-sectional hospital based study was conducted in seven teaching hospitals From Baghdad (Kurkh & Resafa) in a period from December 2010 through June 2012 on 577 patients Includes 356 (61.7%) male patients and 221 (38.3%) females with various skin cancers. Socio-demographic information and full dermatological examination and skin biopsy was done. Facial wrinkles were examined and measured according to wrinkling scores.

Results: Wrinkling scores significantly increased with age, outdoor environment & smoking. There was no difference in wrinkling scores among the type of skin cancers. There was a difference between outdoor & indoor environment in potentiating wrinkling among patients with other tumors. The effect of outdoor working hours on wrinkling was more prominent in non-smokers.

Conclusion: Wrinkles increased with increasing of age, smoking and outdoor environment. There was no difference between smoking and outdoor working hours in relation to wrinkling among basal cell carcinoma and squamous cell carcinoma patients.

Introduction:

Wrinkle is by definition a gross anatomic structure, it is a crease or fold in the skin [1]. There are many risk factors that accentuate wrinkling like age, sex, occupation and smoking. From clinical observation noticed that, patient with skin malignancy are less liable to wrinkling [2].Wrinkles are the most clinically apparent changes in the aging skin, both intrinsically and extrinsically in genetically determined individuals. There are many classifications to wrinkles as fine, medium and coarse wrinkles [3, 4]. Other classifications of wrinkles depending on clinical and histological finding in aged persons include: Deep wrinkles "Permanent wrinkles" Fine shallow wrinkles "temporary wrinkles" [5, 6] so accordingly there are 2 types of skin aging as chronological and photo-aging [7].

Photo-aging is degenerative changes caused by prolonged exposure to electro-magnetic (usually solar) radiation. Two types are found acute and chronic photo damage [6, 8, 9].

Risk factors for extrinsic aging include; cigarette smoking, continuous heat exposure, chemical exposure, skin photo-types and UV irradiation [6]. Smoking increases the risk for facial wrinkling and elastotic changes [6]. Therefore smoking causes premature aging and wrinkling of the face and facial wrinkling was prominently accentuated by smoking [2]. Facial wrinkling go parallel with increasing the number of pack years smoked [8].

Sharquie et al. [2, 11] in their study found a strong relationship between current smokers and facial wrinkles and this correlation was increased with increase in the severity of pack-year smoking especially when combined with excessive exposure to sunlight (as in outdoor occupation). So smokers were much more likely to be prominently wrinkled than nonsmokers. Of a particular interest, the incidence of prominent wrinkling in current smokers occurred in younger age group more than in old age group when matched with nonsmokers [2, 11].

Patients and Methods:

This is a cross-sectional hospital based study was conducted in outpatient dermatological clinic in seven teaching hospitals from Kurkh and Resafa in Baghdad in a period from December 2010 through June 2012. It included 577 patients confirmed with various skin cancers. Every confirmed patient with malignant skin tumor (Histopathologically proved) who attended dermatological and outpatient clinic in these hospitals included in this study. Socio-demographic information and full dermatological examination (by dermatologist and researcher), and skin biopsy was done by (by dermatologist or plastic surgeon and researcher) for every not confirmed case.

1- Age.
2- Occupation (current & past) Outdoor and indoor occupation classified as: less than 4hrs, as indoor occupation and equal or more than 4hrs as outdoor occupation (Children & young considered as no-occupation) [2, 8].
3- Smoking habit was measured by the National Heart, Lung, and Blood Institute, and pack-years were calculated by multiplying the duration of smoking (years) by the reported average number of cigarettes smoked per day during this period, dividing by 20 to convert from cigarettes to packs [11]. Then smoking habits divided into 3 types according to its severity (pack-years) into mild, moderate and heavy

Cigarette smoking (pack-years)	Type
(≤5)	Mild
(6- 10)	Moderate
(≥11)	Heavy [11].

4- Facial wrinkling was classified and measured according to wrinkle score [2, 8]. Grading also was simplified by making (Grade I-II) as superficial, (Grade III- IV); medium, and grade (V-VI) as deep wrinkles [2].

Each subject's face wrinkles were examined closely while the subject was sitting with facial muscles relaxed in a well-illuminated room. The crow's foot area lateral to the outer canthus of each eye was examined closely on both sides. Adjacent areas, including the forehead and cheeks were inspected. Wrinkles were examined for depth, length, and numbers by using specific materials called "Alginate impression" (figure 1) which is a powder used by dentists, by taking this powder and mix it with water and immediately put it by wood stick on the wrinkles of the person as a mask; after few minutes, it will dry up and we remove it and measure the, number, length, and depth, of each wrinkle by tape measure. Other skin characteristics such as color, keratosis, atrophy, and pigmentation were ignored in this classification. Although the perioral and posterior nuchal areas were also inspected changes observed here were not used in assigning a wrinkle score [2, 8]. Wrinkle score measured according to Daniel score equation:

Daniel score = (1.24 + 0.05 - age) * (0.015 – pack-year) * (0.158 - sun exposure) cited in [8].

Data analysis:

Data entry followed by descriptive, and inferential statistics were carried out (by the researcher) utilizing the software statistical package for the social science "SPSS for windows, version 16", and EPI inform, version 6. t-test, Z-test and analysis of variance (ANOVA) test were used to compare means of different variables. Accepted probability cutoff for significancy were set to be ≤5% to >1% denoting significant, and ≤1% denoting highly significant statistical test results. Any value more than 5% was considered non- significant.

Results:

Table No. 1 demonstrate wrinkle score means of non smokers, smokers, and X-smokers, analysis of variance (ANOVA) test used to estimate the differences between them, results found that X-smoker had the higher mean of wrinkle score which was statistically significance P-value = 0.028.

Table No.1 shows the wrinkle score of patients in relation to intensity of smoking in which results found the difference was statistical not significant (P-value = 0.132).

Table No. 1 shows increased wrinkle scores among patients by increasing the age of patients which were statistically highly significance (P-value < 0.0001).

Table No. 1 shows the differences between BCC, SCC, and other skin tumors according to wrinkle score were statistically not significance (P-value 0.586).

Table No. 1 shows the wrinkle score means difference between the indoor patients and outdoor patients was statistically significant (P-value = 0.039).

Table No. 2 demonstrates the wrinkle score means in relation to intensity of smoking among basal cell carcinoma patients, squamous cell carcinoma patients and other tumor patients, results found that differences were statistically not significant (P-value = 0.499, 0.55 and 0 respectively).

Table No.3 demonstrates wrinkle score means of basal cell carcinoma, squamous cell carcinoma, and other skin tumors in relation to indoor versus outdoor working hours, results shows statistical significant difference between indoor and outdoor other tumor patients with (P-value = 0.00006), but for basal cell carcinoma patients and squamous cell carcinoma patients there was no statistical significant (P- value = 0.063 and 0.714 respectively).

Table No. 4 shows wrinkle score means between indoor and outdoor patients in relation intensity of smoking whereas results show the difference was statistically significant only between non-smokers indoor and outdoor patients (P-value 0.031).

Figure No. 1 Facial wrinkles by alginate impression.

Table No. 1: Wrinkle scores of the study group in relation to smoking habit, intensity of smoking, age groups, and working environment.

Variables		Wrinkle score			
		Mean	±SD*	ANOVA	P-value
1-Smoking habit	Nonsmoker (n= 384)	4.99	1.08	1.782	0.028
	Smoker (n = 148)	5.00	1.16		df = 574, 2.
	Ex-smoker (n = 45)	5.14	1.12		
2-Intensity of smoking (pack-year)	Mild smoker ≤ 5 (n = 10) Moderate smoker > 5 ≤ 10 (n = 10) Heavy smoker > 10 (n = 173)	4.85 5.15 5.04	0.85 1.24 1.16	1.292	=0.132 df =190, 2.
3-Age groups in years	< 20 (n = 10) 20-39 (n =51) 40-59 (n = 177) 60-80 (n = 289) >80 (n = 50)	2.33 3.88 5.14 5.10 5.76	0.33 0.28 0.30 0.48 0.51	1.639	< 0.0001 df = 572,4.
4- Histopathology	BCC (n= 300) SCC (n=144) Other tumors (n= 133)	5.00 5.01 5.03	1.26 1.29 1.06	0.975	0.586 df=574, 2.
5-Working environment	Indoor < 4 hours (n= 331) Outdoor > 4 hours (n =246)	4.924 5.119	1.048 1.168	Z Test 2.073	0.039

**SD Standard deviation.*

Table No. 2: Wrinkle scores of the study group in relation to intensity of smoking and type of skin cancers.

		Wrinkle score			
Variables		Mean	±SD*	ANOVA	P-value
1-Basal Cell Carcinoma	Mild smoker ≤ 5 pack-year (n = 3) Moderate smoker > 5 ≤ 10 pack-year (n = 2) Heavy smoker > 10 pack-year (n = 99)	4.64 5.33 5.09	1.51 0.55 1.10	1.018	= 0.499 df=101, 2.
2-Squamous Cell Carcinoma.	Mild smoker ≤ 5 pack-year (n = 4) Moderate smoker > 5 ≤ 10 pack-year (n = 6) Heavy smoker > 10 pack-year (n = 46)	4.99 4.66 4.93	0.30 1.32 1.08	1.010	= 0.55 df= 53, 2.
3-Other tumors	Mild smoker ≤ 5 pack-year (n= 3)	4.87	1.03	0	= 0
	Moderate smoker > 5 ≤ 10 pack -year (n = 2)	6.44	0.13		df = 30, 2.
	Heavy smoker > 10 pack-year (n=28)	5.04	1.50		

**SD Standard deviation.*

Table No.3: wrinkle scores among indoor and outdoor patients in relation to type of skin cancers.

Histopathology	outdoor and indoor working hours						Z Test	P-value
	Indoor > 4 hours			Outdoor ≥ 4 hours				
	Wrinkle score			Wrinkle score				
	Mean	SD*	No.	Mean	±SD*	No.		
BCC (n =300)	4.88	1.13	157	5.12	1.10	143	3.46	0.063
SCC (n =144)	5.00	1.10	81	5.07	1.18	63	0.13	0.714
Other tumors (n = 133)	4.93	0.84	93	5.19	1.38	40	6.86	0.00006

**SD Standard deviation.*

Table No. 4: wrinkle scores among indoor and outdoor patients in relation to intensity of smoking.

Intensity of smoking (pack-year)	outdoor and indoor working hours						Z & t test	P-value
	indoor < 4 hours			outdoor ≥ 4 hours				
	Wrinkle score			Wrinkle score				
	Mean	SD*	No.	Mean	±SD*	No.		
Nonsmoker	**4.91**	**1.06**	**255**	**5.16**	**1.10**	**129**	**4.65**	**0.031**
Mild smoker (≤ 5)	**5.45**	**0.66**	**5**	**4.24**	**0.66**	**5**	**0.12**	**0.755**
Moderate smoker (> 5 ≤ 10)	**4.84**	**1.40**	**4**	**5.36**	**1.22**	**6**	**0.39**	**0.544**
Heavy smoker(> 10)	**4.94**	**1.01**	**67**	**5.10**	**1.25**	**106**	**0.77**	**0.38**

**SD Standard deviation*

Discussion:

There are many risk factors that accentuate wrinkling like age, occupation and smoking [2].

The statistically significant difference of wrinkle score means between non smokers, smokers, and X-smokers, goes with fact that smoker and X-smoker had higher mean of wrinkle score most of them were heavy smoker for long duration and the effect of smoking on the skin still prominent obviously. This finding goes with fact that smoking can affect skin leading to skin aging, wrinkles and skin tumors, the risk increase with increasing of severity and duration of smoking, which agreed with findings of other authors [2, 8, 11, 12].

Although the results in this study showed that the wrinkle score means increased with increasing of intensity of smoking but not reached statistically significant this may indicate that another factors play a role in producing skin aging and wrinkling such as sun exposure, age and endogenous factors [2]. Study finding was not agreed with finding of other author [11] that may be due to the different in the design of the study.

The increasing of wrinkle score among patients with increasing of age with high statistically significant, this indicates that the wrinkling process usually increased with increasing age of patients as process of aging in addition to cumulative effect of UVA on gen and skin tissue fibers and protein which lead to damage and change in its structure leading to wrinkling, smoking play a good role in aggravation of wrinkling with process of aging which agreed with many studies [8, 11, 13, 14]

The absent of statistical differences in wrinkling scores between BCC, SCC, and other skin tumors this indicate that the type of cancers may not affect process of wrinkling rather than other factors involved in producing it (age, smoking, sun exposure and type of occupation) which also represent risk factors for developing of skin tumors and wrinkling as agree by several works [6, 8, 11, 15]. In agreement with this study, *Sharquie et al.* [2] concluded that there was a negative association between wrinkle score and skin cancer, deep wrinkling was less likely to be affected with skin cancer compared with superficial wrinkle.

The difference between the means of wrinkle scores of indoor patients and outdoor patients were statistical significant. This finding agreed with other authors finding that indicate the effect of outdoor working environment on developing wrinkling and the severity of wrinkling strongly associated with increase outdoor hours due to the hazardous effect of UVA which lead to destruction of gens & structural fiber (collagen & elastic fibers) and epithelial cells damage [2, 11, 15].

The wrinkle score means of patients with Basal cell carcinoma, Squamous cell carcinoma and other tumors in relation to intensity of smoking showed no statistically significant difference in each of them. This finding agreed with finding of *Sharquie et al.* [2, 11] when reported in their study that on the contrary basal cell carcinoma of the face was negatively associated with smoking, and wrinkling may consider as endogenous protective factor against skin cancer, other Author reported that no association between smoking and basal cell carcinoma [16]. Other skin tumors usually developed in middle age group so wrinkling less prominent in those patients which agreed with [2]. This finding may indicates that wrinkling may not associated with type of skin cancers in relation to intensity of smoking.

The effect of outdoor environment in producing wrinkling was more prominent in other tumors patients which were statistically significance. Still wrinkling scores in basal cell carcinoma and squamous cell carcinoma was higher in outdoor than indoor but did not reach significant level. This finding may indicate negative association between wrinkling and basal cell carcinoma and squamous cell carcinoma (patients with skin cancer less liable for wrinkling), while for other tumors was not , which agreed with [2, 11]

Studying the effect of environment factors and smoking in potentiation of wrinkling in this study found that among outdoor non-smokers the difference was statistically significant this finding was not agreed with the finding of *Sharquie et al.*[2] when they were reported that wrinkling more prominent in outdoor smoker patients, the difference may be due to the difference in the design of the

study or the sample size, because non-smoker in this study was more than smoker and most of them old age with outdoor working environment. Moreover smoking may not be the only factor that affect wrinkling but may aggravated by other factors (age, family history, sun exposure, nature of the work, etc) in the development of wrinkling, these results agreed with [8, 11].

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