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THE PREVALANCE OF ENVIRONMENTALLY INDUCED LIP PATHOLOGY AMONG A--ETC(U)
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⑥ THE PREVALANCE OF
ENVIRONMENTALLY INDUCED LIP PATHOLOGY
AMONG ACTIVE DUTY SOLDIERS,

⑩
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⑪ 1974

⑫ 12

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The nature of military operations frequently requires exposure of soldiers to hazardous environmental factors for prolonged periods of time. Among the environmental factors known to be causally related to the development of pathological conditions of the lips is actinic radiation.¹⁻⁸

The acute effects of overexposure to actinic radiation on the lips are sunburn and in conjunction with other factors, such as wind, temperature and humidity extremes, and repeated tongue contact, chapped lips. While the acute problems may not constitute true medical emergencies, performance efficiency and the capacity for voice transmission may be impaired.

Knox et al⁷ demonstrated moderate to severe actinic changes in 33% of persons 25 to 33 years of age. Kligman⁸ found moderate actinic damage in 25% of subjects 10 to 19 years old and moderate to severe changes in 50% of subjects 20 to 29 years old. The ear was most often affected followed closely by the cheek and lower lip.

Leband and Bumstead⁵ surveyed 996 soldiers 20 to 30 years of age returning from Korea. A high statistical correlation was noted between the presence of lip lesions and the type of duty performed by the soldiers. All lip lesions were found in fair skinned soldiers assigned outside duties. Bernier and Clark⁴ made an extensive investigation of lip carcinoma among military personnel and noted a high incidence in soldiers with a fair or ruddy complexion and particularly those with outdoor duties. The average age of patients with lip cancer in their study was 37 years of age.

MATERIALS AND METHODS

Datum on age, sex, complexion, percentage of time devoted to outdoor duties, and the prevalence of acute and chronic lip damage were recorded on 1,442 soldiers. The study was conducted in 1977 during Joint Readiness Exercises (JRX) Solid Shield and Brave Shield XVI. JRX Solid Shield took place at Ft. Stewart, GA and JRX Brave Shield XVI was conducted at 29

Palms, Calif. The soldiers examined were all engaged in outdoor activities at the time of the survey.

The lower lip of each individual in the study was examined to determine the prevalence of acute and chronic changes. The following classification was used:

NORMAL - No changes noted.

MILD - The lip will exhibit focal areas of thickening with color alteration. No scaling, crusting, or ulcerations will be present. The vermillion border will be at least 80% distinct. No symptoms will be present.

MODERATE - The lip will exhibit several areas of thickening, color changes will be noticeable and areas exhibiting scaling may be present. The vermillion border will be at least 20% distinct. No symptoms will be present.

SEVERE - The lip will be diffusely involved with hypertrophic and atrophic areas. Coloration may be markedly altered. Areas of scaling and/or crusting will be present. The vermillion border will be indistinct. No symptoms will be present.

ACUTE - The lip will be chapped and/or sunburned. The change will be symptomatic.

The complexion was classified into the following four groups:

1. Very fair - noticeably sun sensitive
2. Fair - average Caucasian
3. Olive
4. Dark - Black

The data was entered onto computer cards and analyzed.

RESULTS

The age distribution is presented in Table I. There were 1,376 males

and 66 females (4.5%). Six hundred and twenty (43.0%) stated that over half of their duty hours were spent indoors. Five hundred and forty-six (37.9%) stated that over half their duty time was spent outdoors and 276 (19.1%) stated indoor-outdoor duty time was approximately equal. The complexion of the soldiers was very fair 74 (5.1%), fair 990 (68.7%), olive 134 (9.3%), and dark 244 (16.9%).

Fifteen percent of the sample population exhibited acute lip changes. Forty-eight and one-half percent had normal lips. Forty-four and nine tenths percent exhibited mild chronic change and 6.6% exhibited moderate chronic change. Only 0.1% had severe chronic lip change. Cross tabulation of the variables including age, complexion and type of duty as tabulated against lip classification is present in Tables II-IV.

Nineteen and nine tenths percent of the 1,065 soldiers examined at JRX Solid Shield exhibited acute changes while only 3.4% of the 377 soldiers examined at JRX Brave Shield were found to have acute lip change. No difference in the distribution of soldiers with chronic lip change was noted. The distribution of soldiers with acute changes by complexion was dark, 5% of 244, olive 13.5% of 134, fair 17.4% of 990, and very fair 25% of 74.

DISCUSSION

Cross tabulation of the age data against the lip classification revealed as expected that the severity of lip changes increase with age. Of particular interest was the fact that 37.4% of the soldiers below 20 years of age exhibited mild chronic lip change. Forty-three percent of the 20 to 29 year old group had mild changes. These findings are in general agreement with those reported by Kligman.⁸

The amount of skin pigmentation was inversely proportional to the severity of lip damage. Approximately one-half of all soldiers with fair or very fair complexions had mild chronic lip change. Only 8% of the olive and 0.2% of the dark complexioned soldiers exhibited mild lip damage. Forty-three percent of the personnel surveyed stated that they spent more than half their duty time indoors, 37% out of doors, and 19.1% spent equal time indoors and outdoors. The difference in the degree of chronic lip change among the three groups was not significant. One might assume that personnel spending more time out of doors and thus exposed to more actinic radiation would exhibit an increase in the incidence and severity of chronic lip change. While this assumption is believed valid, the age distribution of the survey population would tend to obscure this effect. Only 7% of the survey population was over 40 years of age with 56.4% being 20 to 29 years old. The effect of duty related environmental exposure to lip damage and the subsequent development of carcinoma may be realized only by studying an adequate number of older personnel.

A significant geographic difference was noted in the 225 soldiers with acute lip damage. Ninety-four percent of the acute lip changes were seen in personnel participating in JRX Solid Shield at 29 Palms Marine Corps Base, California. Six percent of the personnel with acute lip changes were seen at JRX Brave Shield at Fort Stewart, Georgia. The weather at both locations was predominately clear and sunny. The significant variables appeared to be temperature, humidity and terrain. The temperature at 29 Palms averaged over 100°F with very low humidity. The temperature at Fort Stewart was in the mid 80's with a high relative humidity. Twenty-nine Palms is located in the high desert area while Fort Stewart is located in a low lying pine forest.

SUMMARY

The lower lips of 1,442 soldiers were examined under field conditions to determine the prevalence of acute and chronic lip change due to environmental factors. Fifteen and one-half percent exhibited acute changes consisting of chapped and/or sunburned lips. Forty-eight and one-half percent had normal lips. Chronic lip changes were classified as mild-44.8%, moderate-6.6%, and severe-0.1%. An increase in the incidence and severity of chronic lip damage was noted with increasing age, and in soldiers with very fair and fair complexions. No significant difference was noted between the degree of lip damage and whether the majority of duty time was spent inside or outside.

CONCLUSIONS

From the datum generated within the parameters of this study the following conclusions are drawn:

1. Fair and olive complexioned soldiers assigned duties in hot arid climates should take protective measures to avoid chapped and/or sunburned lips.
2. Chronic lip damage resulting from exposure to environmental factors does not appear related to whether duty is primarily inside or outside.
3. The degree of lip damage increases with age.
4. Chronic lip damage is very rarely observed in olive or dark complexioned individuals.

These conclusions reveal no particular surprises. Curiously, however, there has been a paucity of controlled data upon which to draw despite the fact that these conclusions are widely accepted. It is hoped therefore, that this study will provide a data base for studies relating to environmentally induced lip pathology, its possible prevention and treatment and its long term carcinogenic potential.

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TABLE I

AGE	10-19	20-29	30-39	40-49	50-59
Number	187	814	338	88	15
Percent	13	57	23	6	1

AGE DISTRIBUTION BY DECADE OF 1,442 SOLDIERS

TABLE II

AGE	NORMAL	MILD	MODERATE	SEVERE
10-19	115 - 61.5%	70 - 37.4%	2 - 1.1%	0 - 0%
20-29	448 - 55.0%	352 - 43.2%	13 - 1.6%	1 - 0.1%
30-39	109 - 31.8%	181 - 53.2%	50 - 15.0%	0 - 0%
40-49	23 - 26.1%	40 - 44.3%	25 - 29.5%	0 - 0%
50-59	4 - 30.8%	3 - 23.1%	5 - 38.5%	1 - 7.7%
Totals	699	646	95	2

LIP CLASSIFICATION BY AGE

TABLE III

COMPLEXION	NORMAL	MILD	MODERATE	SEVERE
Very fair	20 - 27.0%	44 - 59.5%	10 - 13.5%	0 - 0%
Fair	376 - 38.0%	532 - 53.7%	80 - 8.1%	2 - 0.2%
Olive	97 - 72.4%	33 - 8.1%	4 - 3.0%	0 - 0%
Dark	206 - 84.4%	37 - 0.2%	1 - 0%	0 - 0%
Totals	699	646	95	2

LIP CLASSIFICATION BY COMPLEXION

TABLE IV

TYPE OF DUTY	NORMAL	MILD	MODERATE	SEVERE
Indoor	300 - 48.3%	283 - 45.6%	37 - 6.0%	0 - 0%
Outdoor	261 - 47.8%	244 - 44.7%	41 - 7.5%	0 - 0%
50/50	138 - 50.0%	119 - 43.1%	17 - 6.2%	2 - 0.7%
Totals	699	646	95	2

LIP CLASSIFICATION BY DUTY

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DDC TAB	<input type="checkbox"/>
Unannounced Justification	<input type="checkbox"/>
By _____	
Distribution/ _____	
Availability Codes _____	
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