

SUNSHINE EXPOSITION, TOBACCO SMOKING AND PROGRESSIVE SUPERFICIAL DERMATOSES

S. Radev¹, V. Michev², V. Tomov³

¹Naval Hospital of Varna, Division of Dermatology, BG-9010 Varna, Phone: +359-52-307730, E-mail: simoesradeff@yahoo.co.uk; ²Military Medical Academy, Department of Dermatology and Venereology, Sofia, and ³University of Economics, Speciality of Tourism, 77 Knyaz Boris I Blvd, BG-9002 Varna, Bulgaria, Phone: +359-52-322524, E-mail: vic_tomov@yahoo.co.uk

Abstract

A 15-year long (1984-1999) study was performed with 500 Bulgarian military sailors aged 18 years. Several clinical, anamnestic, epidemiologic, mycologic, allergologic and valeomedical methods were used. According to the degree of their exposition to ultra-violet solar radiation, the young sailors were divided into three groups: moderately exposed (A), without exposition (B), and intensively exposed (C). Males from group A were completely resistant to some manifestly progressive superficial dermatoses such as *Herpes simplex labialis* and *Aphthae vulgares*. They were less affected than those from the other groups by some manifestly progressive skin diseases: by 2,3 and 2 times, respectively, by *Epidermophytia pedum chronica* (in 25%), by 2,2 and 1,8 times, respectively, by *Epidermophytia inguinalis* (in 15%), etc. The differences between non-smokers and sailors delivered by mothers smoking during the pregnancy were dramatic. The disturbed biological measure concerning many ecological factors, including the prolonged exposition to enhanced solar radiation combined with chemical air pollution, gradually reduces the immune homeostasis and increases the susceptibility to skin infections. Intensive sea-resort tourism in Eastern Europe necessitates the elaboration of a standardized solar exposition schedule. An appropriate sun protection of Nordic people could ensure a successful prevention of the ultraviolet-light-induced immune suppression and skin cancer as well.

Introduction

Sunshine exposition, smoking, raising global anthropogenic discomfort and iatrogeny are particular actual topics and thus subject of intensive discussions. Along with the ecological imbalance these issues are particularly important in Eastern Europe. These factors are, in fact, conditions that interact with the causes to induce a given event, including the actions on the system of health and disease and the transitions between these states. In this respect, the conditions mediate, unlock, direct and modify, but not manage the processes as there does not exist any causal (genetic) relation between them and the consequence. Without the conditions, however, in Hegel' spirit, there is no essence, no existence at all.

The purpose of the present paper is to examine the relationship between the degree of sunshine exposure, tobacco smoking, and the susceptibility towards superficial skin affections of progressive type.

Methods

The 15-year long (1984-1999) longitudinal study covered a randomized sample of 422 Bulgarian military sailors, hereditary villagers, aged 18 years. Several clinical, anamnestic, epidemiologic, mycologic, allergologic and valeomedical methods were used. According to the degree of their exposition to ultra-violet solar radiation, the young sailors were divided into three groups: moderately exposed (A), without exposition (B), and intensively exposed (C). To the group A belonged the individuals with 10-20 sun-baths (SB) of 1-3 hours daily during three summer months. To group C belonged the subjects with more than 20 SB. Moderate smokers (Sm-M) smoked between 10 and 15 cigarettes daily while strong smokers used more than 15 cigarettes daily. Parental smoking (PSm) habits were also taken into consideration, i. e. father smoker and mother smoker. Among the numerous epidemic-evolutive types of skin lesions only two basic ones were examined: a refractory and manifestly progressive evolution of the disease. The subjects who were not exposed to sunshine, who did not smoke and which parents did not smoke were specifically assigned. Those of the individuals who presented with atopy (AT) combined with familial predisposition were assigned as AT (+)FAT.

Results

Our comparative data on Table 1 and Table 2 indicate that the subjects of group C and strong smokers (Sm-S) are stronger generators than those of group B and non-smokers (Sm-N) not only of AT (+)FAT but also of nail mycoses (NM) and manifest progressive *Aphthae vulgares* (Av).

Table 1: Effect of Some Environmental Factors on Epidemic-evolutive Dynamics of Atopy and Epidermophytosis

		n	Rf / (+)FAT		Rf / ChrE		Rf / NM		Tr. r.
SB	N	138	17	32	21	58	88	12	31
	M	156	42	12	65	25	90	10	42
	S	120	30	45	32	54	82	16	38
Sm	N	138	41	17	35	41	93	7	37
	M	222	35	30	57	39	100	0	34
	S	162	20	50	38	54	73	27	32
PSm	N	84	33	21	50	36	93	7	28
	M	114	43	26	45	50	75	25	33
	S	36	0	50	0	50	75	25	33
BF	N	84	25	25	29	42	57	43	30
	M	72	30	40	28	63	100	0	25
	S	150	27	36	32	48	80	20	32

Legend: N - no; S - strong; M - moderate; Rf - refractory;
ChrE - chronic epidermophytosis; Tr. r. - *Trychophyton rubrum*

The absent broad spectrum of direct correlation between the subjects of group C and strong smokers and the susceptibility towards the skin affections of manifestly progressive type is a consequence of their proved higher affinity to solar exposition

(1). This leads to interference of negative effects of smoking with positive effects of solar radiation.

Table 2: Effect of Some Environmental Factors on Epidemic-evolutive Dynamics of Some Viral Infections

		n	Rf / HSL		Rf / Av		Rf / Pov		Rf / >2 Poi	
SB	N	138	86	4	60	8	53	4	15	25
	M	156	60	0	55	0	50	0	25	10
	S	120	39	8	47	13	35	10	10	25
Sm	N	138	69	20	63	4	38	12	26	30
	M	222	38	10	70	0	38	0	24	6
	S	162	62	10	50	15	38	12	22	30
PSm	N	84	29	0	39	16	29	0	42	8
	M	114	48	5	56	5	43	5	35	12
	S	36	0	0	26	0	0	0	33	20
BF	N	84	44	22	67	11	33	0	12	25
	M	72	55	11	73	0	7	3	27	27
	S	150	42	12	35	20	40	10	20	40

Legend: HSL - Herpes simplex labialis; Pov - polyviroses; Poi - polyinfections

These results confirm the immunosuppressive effect of UV-radiation (2,3,4,5,6) and intensive smoking (7,8,9,10). On this background it is noteworthy that the stronger harmful effect on the organism of exogenous agents such as intensive smoking towards intensive sunshine exposition. It is logic because of the attributive nature of the sunshine for human health.

The harmful effect of smoking is demonstrated by symmetrical figures of distribution of the susceptibilities towards manifest progressive skin lesions among children of smoking mothers. This sample is the only powerful generator of more than two Poi that are absent in intensive sunshine exposition and intensive smoking. This is in agreement with data about an outlined negative influence of mother's smoking during pregnancy on the offspring (11,12,13,14,15,16,17,18).

The results on Table 3 show a powerful morbistatic effect of intensive sunshine exposition on androgen-associated skin diseases such as Pityriasis versicolor (Pv) and Acne vulgaris (Ac) as far as they share common organism niches (seborrhoeic zones). Such an effect has not been observed in dandruff (Df) as its organism niche (capillitium) is not directly exposed to solar radiation.

This assumption is supported by the stronger generation of manifestly progressive Pv, Ac and Df among strong smokers and proves the powerful stimulating effect of nicotine on sebum production. *Folliculitis superficialis femoris* (FSF) of manifestly progressive type is an exception from this correlation as it is not an androgen associated dermatosis and not a particular form of Ac manifestation but an autochthonous infection, i. e. saprobacteriosis.

Table 3: Effect of Some Environmental Factors On Epidemic-evolutive Dynamics of Some Saprophyte Skin Infections and Dermatoses

	n	Rf / FSF	Rf / Pv	Rf / Ac	Rf / Pv+Ac	Rf / Df						
SB	N	138	60	10	58	4	59	35	56	5	31	15
	M	156	61	6	75	10	50	14	50	0	59	29
	S	120	61	11	58	4	83	11	57	0	38	41
Sm	N	138	66	14	52	0	79	21	53	0	44	25
	M	222	67	6	56	0	72	7	53	0	50	33
	S	162	70	4	56	17	50	33	44	10	27	43
PSm	N	84	50	20	71	7	76	12	56	8	71	0
	M	114	70	0	55	5	77	15	61	0	61	23
	S	36	40	0	80	0	67	22	25	0	38	25
BF	N	84	40	0	44	11	78	11	50	10	63	25
	M	72	50	25	55	0	63	12	30	0	43	0
	S	150	84	11	36	14	48	33	30	8	31	50

Discussion

The comparative analysis of some factors of fundamental significance for the human organism such as sunshine and breast feeding (BF) reveals a series of essential correlations. Both moderate sunshine exposition and sufficient BF (4-8 months long) represent, obviously, weaker generators of NM, manifestly progressive HSL infections, Av, Pov and more than two Poi (Ac and Pv) towards the strong degrees of sunshine exposition and BF. The disturbance of the physiological norm of acquisition even of vitally important environmental factors exerts a negative effect on the adaptation and susceptibility, respectively, towards infectious and non-infectious dermatoses. This phenomenon is symmetric to another one such as over-consumption of meat leading, on its part, to cancerogenesis. The intensive sea-resort tourism in Eastern Europe necessitates the elaboration of a standardized solar exposition schedule. An appropriate sun protection of Nordic people could ensure a successful prevention of the ultraviolet-light-induced immune suppression and skin cancer as well. In this respect, the role of the regular exposition of tourists to solar radiation during the summer holidays should be emphasized and popularized.

Conclusions

(1) Intensive smoking and particularly mother's smoking during pregnancy as a harmful causative agent exerts, as a rule, a stronger negative effect on the adaptation and resistance, respectively, to skin affections in comparison with the intensive sunshine exposition.

(2) Independently of the substantial importance of the sunshine exposition and BF for human health, the disturbance of the norm of their acquisition induces negative effects on the adaptation, on the system of health and disease and on the transitions between them.

References

- (1) J. Vulliet, Smoking and sebaceous glands: pathology, J Eur Acad Dermatol Venereol, **14/Suppl. 1**, 101, (2000)
- (2) O. Baadsgaard, B. Salvo, A. Mannie, B. Dass, D. A. Fox, K. D. Cooper, In vivo ultraviolet-exposed human epidermal cells activate T suppressor cell pathways that

- involve CD4+CD45RA+ suppressor-inducer T cells, *J Immunol*, **145/9**, 2854-2861, (1990)
- (3) P. Hersey, M. MacDonald, C. Henderson, S. Schibeci, G. D'Alessandro, M. Pryor, F. J. Wilkinson, Suppression of natural killer cell activity in humans by radiation from solarium lamps depleted of UVB, *J Invest Dermatol*, **90/3**, 305-310, (1988)
- (4) J. M. Rivas, S. E. Ullrich, The role of IL-4, IL-10, and TNF-alpha in the immune suppression induced by ultraviolet radiation, *J Leukoc Biol*, **56/6**, 769-775, (1994)
- (5) M. L. Kripke, Ultraviolet radiation and immunology: something new under the sun - presidential address, *Cancer Res*, **54/23**, 6102-6105, (1994)
- (6) T. A. Luger, T. Schwarz, The role of cytokines and neuroendocrine hormones in cutaneous immunity and inflammation, *Allergy*, **50/4**, 292-302, (1995)
- (7) S. Hockertz, A. Emmendorffer, G. Scherer, T. Ruppert, H. Daube, A. R. Tricker, F. Adlkofer, Acute effects of smoking and high experimental exposure to environmental tobacco smoke (ETS) on the immune system, *Clin Biol Toxicol*, **10/3**, 177-190, (1994)
- (8) K. A. Byron, G. Varigos, A. Wootton, IL-4 production is increased in cigarette smokers, *Clin Exp Immunol*, **95/2**, 333-336 (1994)
- (9) D. J. Tollerud, L. M. Brown, W. A. Blattner, D. L. Mann, L. Pankiw-Trost, R. N. Hoover, T cell subsets in healthy black smokers and nonsmokers. Evidence for ethnic group as an important response modifier, *Am Rev Respir Dis*, **144/ 3 Pt 1**, 612-616, (1991)
- (10) D. L. Sherrill, M. Halonen, B. Burrows, Relationships between total serum IgE, atopy, and smoking: a twenty-year follow-up analysis, *J Allergy Clin Immunol*, **94/6 Pt 1**, 954-962, (1994)
- (11) M. Frydman, The smoking addiction of pregnant women and the consequences on their offspring's intellectual development, *J Environ Pathol Toxicol Oncol*, **15/2-4**, 169-172, (1996)
- (12) G. Güler, Ü. Önes, A. Kilic, Z. Tamay. The effect of exposure to environmental tobacco smoke on clinical findings in asthmatic schoolchildren, *J Allergy Clin Immunol*, **105/1 Pt 2**, S 125, (2000)
- (13) D. G. Cook, D. P. Strachan, Health effects of passive smoking. 3. Parental smoking and prevalence of respiratory symptoms and asthma in school age children, *Thorax*, **52/12**, 1081-1094, (1997)
- (14) R. I. Ehrlich, D. Du Toit, E. Jordaan, M. Zwarenstein, P. Potter, J. A. Volmink, E. Weinberg, Risk factors for childhood asthma and wheezing. Importance of maternal and household smoking, *Am J Respir. Crit Care Med*, **154/3, Pt 1**, 681-688, (1996)
- (15) D. R. Neuspiel, D. Rush, N. R. Butler, J. Golding, P. E. Bijur, M. Kurzon, Parental smoking and post-infancy wheezing in children: a prospective cohort study, *Am J Publ Health*, **79/2**, 168-171, (1989)
- (16) F. D. Martinez, M. Cline, B. Burrows, Increased incidence of asthma in children of smoking mothers, *Pediatrics*, **89/1**, 21-26, (1992)
- (17) S. Logan, N. Spencer, Smoking and other health related behaviour in the social and environmental context, *Arch Dis Child*, **74/2**, 176-179, (1996)
- (18) B. L. Horta, C. G. Victora, A. M. Menezes, R. Halpern, F. C. Barros, Low birthweight, preterm births and intrauterine growth retardation in relation to maternal smoking, *Pediatr Perinatol Epidemiol*, **11/2**, 140-151, (1997)