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THE PREVALENCE OF CUTANEOUS VIRAL AND FUNGAL INFECTIONS AND THE DELAYED-TYPE HIPERSENSITIVITY, AMONG PATIENTS WITH DERMATOLOGICAL DISEASE

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Abstract

There are nowdays a widespreade opinions related to how climate changes and annual seasonality each or together, might influence the prevalence of dermatological skin diseases among different patient populations. Some of these diseases, taken into consideration by many of dermatologists and environmental researches as well, are wart, tinea and eczema, both of them within different ways of manifestation.

We will try by this review to confirm or not, potential correlations between prevalences level land seasonality, gender and finaly living areas for all patients that come at medical office during 2014, and claimed abovementioned diseases symptoms. Before any further conclusions we have to mention that sample was taken only for warts, tinea and eczema, regardless other complementary medical conditions.

Key words: warts, molluscum, tinea, eczema, gender, rural, urban

INTRODUCTION

Human Papillomavirus infections (HPV)

In the category of cutaneous HPV infections there are: warts, planting, flat papillomas, and other lesions. The frequency of skin warts, has been growing in the recent decades up to at least 10% of entirely population (Ockenfels HM, 2016).

This cases occur usualy through contact with infected people or surfaces as well, micro-traumatized skin (an intact skin being a strong obstacle against infection) and quite often among those people how who use public swimming pools. So far there are between 100-150 types of human papillomaviruses, 80 of them being well studied.

Plantar warts are common skin conditions seen in both children and adults (Vlahovic TC, Khan MT, 2016). Although warts are ubiquitous, there are no defined treatments. Especially in the first six months, warts can be frequently resolved without therapeutic intervention. This might complicates data reading and other inferences, mainly because dificulties of old / new cases clasification (Ockenfels HM, 2016).

Molluscum contagiosum infections (MCV)

Molluscum contagiosum is a poxvirus infection and togheter with warts are very common viral skin infections, usually presenting in childhood. For both infections, there are new evaluations of immunological approaches to terapy (Sterling J, 2016). Transmission take place by contact with other infected person or directely through to various objects. The incubation period is about two weeks to six months.

While the data is limited, several studies have estimated the worldwide prevalence to be between 5% and 7,5% of children, but the number increases to 5-18% within the human immunodeficiency virus positive population and even reaches 30% among acquired immunodeficiency syndrome. The infection has a higher frequency in tropical areas where the incidence can approach 20% in all children. It is not known whether this increased prevalence is due to a founder effect-associated genetic susceptibility of these populations to MCV infection, or whether MCV becomes more virulent in tropical conditions (Harrison P, Nguyen BA, and Stephen K. Tyring, 2014).

Fungal infections

There are over 50,000 species of fungi in our environment, but only 200 are aassociated with human diseases and only 20-25 of them are common causes of infection. Most fungal infections occur when a person is exposed to a infective spores source on surfaces like soil, air or even animals and plants. The transmission is done so from person to person by direct contact or through objects or suraces touched by infected people. Dermatophytes feed on keratin and infections caused by these fungi are called tinea.

The prevalence of superficial mycotic infection worldwide is 20-25% of which dermatophytes are the most common agents. The last few years have seen a significant rise in the incidence of chronic dermatophytes infections of skin which have proven difficult to treat (Alok Kuman Sahoo and Rahut Mahajan, 2016).

Dermatophytes are classified into three groups: *Trichophyton, Epidermophyton and Microsporum*. Based upon mode of transmission, these are: anthropophilic, zoophilic and geophilic.

Despite the increasing prevalence of cutaneous dermatophytosis across the world,especially in tropics, research in this area has often been neglected. Other factors such as increased urbanization including the use of occlusive footwear and tight fashioned clothes, has been linked to higher prevalence. All people are not equally susceptible to fungal infection, even when they have similar rik factors, There is evidence of familial or genetic predispositions that could be mediated by specific defects in innate and adaptive immunity. The pathogenesis of dermatophyte infection involves

complex interaction beetween host, agent and the environment (Alok Kuman Sahoo and Rahut Mahajan, 2016).

Immunocompromised status, diabetes mellitus, lymphomas, Cushing` syndrome could produce severe, widespread, or recalcitrant dermatophytosis. Some areas of the body are more susceptible to the infections such as intertriginous areas (web spaces and groins), where excess sweating, maceration and alkaline pH, favor the growth of the fungus (Alok Kuman Sahoo and Rahut Mahajan, 2016).

The most frequent localization are: tinea unguium (66,8%), followed by tinea pedis (16,4%) and tinea capitis (8,1%). In a study of Capone and al., dermatophytes were isolated in 79.5% of mycological examinations (Capote AM at al, 2016)

Eczema

From the epidemiological point of view, eczema is one of the most common dermatological diseases, being in charge for 20-30% of all hospitalizations. It is a hypersensitivity delayed skin reaction, most often relapsing from multiple causes such as exogenous and endogenous as well. Exogenous eczemas are allergic or irritant, those endogenous are atopics and those mixed exo-endogenous are: nummular, seborrheic, infectious, gravitational, associated with internal diseases, with intestinal malabsorption and others.

Atopic eczema is associated in 70-85% of cases with high IgE levels, which means that a lot of number of patients will have exacerbations of eczema after the contact with airborne allergens or after ingestion of food allergens and improvements by avoiding contact with them. An important role is assigned to supermicrobial antigens, viral and fungal as well, and also to increased self-reactivity.

Irritant contact eczema are caused by substances with destructive effect on skin, occuring to anyone that take contact with such a substance (detergents, alkalis, acides and so forth), representing 80% of contact dermatitits.

Allergens include the following: preservatives in ointments, dyes, nickel, chromates, lanolin, resins, and so on. Approximately 3,000 chemicals have been identified and documented as a cause of allergic contact eczema. About 25 chemicals are responsible for more than half of all cases of allergic contact dermatitis.

In a study of Ibler et al. was found the health workers who were tested for allergic contact dermatitis, 53% had positive patch test. Reactions have been to: nickel, thiomersal, fragrances, rubber chemicals and colophonium (Ibler KS at al, 2016).

In another study of 455 young workers, who were working as hairdressers, jewelers or car mechanics, the prevalence of hand / forearms

eczema was 44,4%. This could provide a basis for occupational health professionals in order to plan prevention programmes for youg workers (Aktas E, Esin MN, 2016).

Other researchers found that 51,6% amoung 126 patients experienced allergic reaction to one allergen kit european standard and about 17,4% at least one corticosteroid. The most frequent allergens were nickel sulfate, cobalt chloride, budesonide, potassium dichromate and myroxylon pereirae resin (Kot M, at al, 2016).

The average of total annual cost per patient, ranged from € 1712 to € 9792 direct and indirect. Occupational hand eczema patiens showed indirect costs up to 70% of total costs, mainly because of absenteeism (Politiek K at al, 2016).

AIM

The purpose of the present work is to analyze the prevalence of viral and fungal, as well as delayed type sensitivity reaction for patients screened in ambulatory medical office and whether or not they have a causal relationship with environmental changes related to various annual periods, respectively sesonality expressed by quarters and while the lifestyle represented by urban and rural permanent residence.

Scopul lucrarii prezentate este de a analiza prevalenta infectiilor virale si micotice cat si a reactiilor de sensibilizare de tip intarziat la pacientii consultati in regim de ambulator si daca acestea au sau nu o legatura cauzala cu schimbarile de mediu aferente diferitelor perioade anuale, respectiv sezonalitatii exprimate prin trimestre si in acelasi timp stilului de viata reprezentat de domiciliul permanent, respectiv domiciliul in mediu rural sau urban.

MATERIAL AND METHOD

Our objective was to assess the potential impact of overall environmental condition represented by quarters and area of living for Bihor county patients represented by urban and rural residences, above prevalence of two main skin diseases, respectively warts and molusculum on the one hand and eczema on the other. The survey was take into consideration 2014 period. Colected data are presented on Table 1.

The study was included 81 patients as far as the warts and molluscum diseases are concerned, and 111 patients with eczema. Following the two criteria chosen in this survey, we investigated 160 patients from urban area and 32 from rural, overall percentage being preserved among this two general diseases considered main topics on this survey. On the other hand, we have tried to find potential correlation among

four different patients age categories, respectively 1-14 years, 15-64 years and over 65 years old.

Regarding gender distribution, were investigated 85 male patients and 107 female, which indicates a relatively balanced proportion (45% / 55%) in respect to abovementioned manifestations.

Table 1

Evolution of number of patients based on age, area of living and gender

	Age				Area of living		Gender	
	0-1	1-14	15-64	>65	Urban	Rural	M	F
Warts / Molluscum								
1Q		4	18		16	6	6	16
2Q		3	18		16	5	9	12
3Q		4	18		19	3	10	12
4Q		4	10	2	15	1	8	8
Total		***15***	***64***	***2***	***66***	***15***	***33***	***48***
Eczema								
1Q		8	24	3	26	9	13	22
2Q		5	19	3	25	2	15	12
3Q		5	20	1	22	4	12	14
4Q		3	15	5	21	2	12	11
Total		***21***	***78***	***12***	***94***	***17***	***52***	***59***
Tinea								
1Q			5		5		5	
2Q		1	13	3	16	1	7	10
3Q			9		8	1	4	5
4Q			3	1	4		2	2
Total		1	30	4	33	2	18	17
Total general		***37***	***172***	***18***	***193***	***34***	***103***	***124***

Another area of interest taken into consideration was to gather data which might indicate potential connections between environmental periodical changing factors (represented by quarterly of year and living areas) and allergic or irritative dermatitis on the other side.

Table 2

Evolution of number of patients based on types of Eczema

	Exogenous alergic eczema	Exogenous irritative eczema	Atopic eczema	Mixed eczema
1Q	3	6	1	25
2Q	2	6	1	18
3Q	4	1	1	20
4Q	2	7	1	13
Total	*11*	*20*	*4*	*76*

RESULTS AND DISCUSSION

Data have shown us that there is a lot of discrepancies between registered number of cutaneous manifestations among patients' living places and their age as well. No corelations have found between each quarter and number of patients who come at medical office. This might indicates that annual seasonality have no influence above prevalence level.

Statistical significant P-values confirm this abovementioned comments as data from Table 2 indicates.

Table 2

ANOVA - Warts and molusculum

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Quarterly	12,375	3	4,125	1,0879121	0,4732029	9,2766282
Urban / Rural	325,125	1	325,125	85,747253	0,002665	10,127964
Error	11,375	3	3,7916667			
Total	348,875	7				

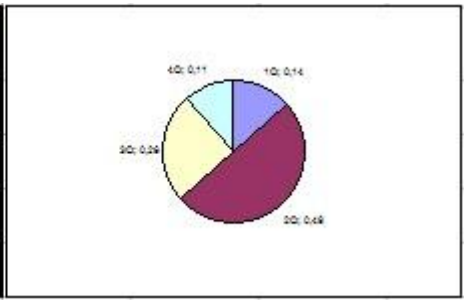
ANOVA - Warts and molusculum

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Quarterly	12,375	3	4,125	0,4361233	0,7433812	9,2766282
Males / Females	28,125	1	28,125	2,9735683	0,1831017	10,127964
Error	28,375	3	9,4583333			
Total	68,875	7				

There is a significant differences between patients comming from urban area and those from rural one, P-value = 0.0026. Statisticaly, there is no diferences between quarters as far as gender issue is concerned, P-value = 0,183, being a strong indicator related to this statement. Even if this high level of P-value should indicated us a lack of correlation (accepted rule of thumb is maximum 0,05), we have to take a close look in the future upon this matter.

Based on that figures, we might conclude that local enviromental excitatories (level of industrial pollution, feeding habits, noise and cars pollution, level of workday stress, and so on), are semnificant diferentiators as far as living areas are concerned. Finally, we must pay attention on those social factors as accesibility for medical office, daily labor payment level, prior education, sanitation and so forth, all of them important factors on patients decision making process related to their presence to a dermatologist.

Seasonality	% of total number of patient with Tinea
1Q	0,14
2Q	0,49
3Q	0,26
4Q	0,11



The higher rates are found in Q2 and Q3 of the year, which shows that addressing patients with fungal infections is highest in spring-summer season.

Another issue is represented by differences between alergic eczema and irritative one as well. Statistical analysis show us the following data in terms of P-value significance.

ANOVA Eczema types and quarter variations *Table 3*

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Quarter	26,25	3	8,75	0,8974359	0,495141	4,7570627
Eczema type	661,5	2	330,75	33,923077	0,0005364	5,1432528
Error	58,5	6	9,75			
Total	746,25	11				

The above data, might indicate that there are no statistical differences between annual seasonality as far as number of patients are concerned, but only types of eczema. According with this, environmental conditions are not semnificativ factors for allergic eczema's number of incidents.

CONCLUSIONS

Statistics shows us that warts and moluscum on the one hand and allergic and irritative eczema on the other hand, are both no correlated with annual seasonality. There is a slight presence of correlation for all this cases with gender and living areas.

The higher rates are found in Q2 and Q3 of the year, which shows that addressing patients with fungal infections is highest in spring-summer season..

The most commun eczema are mixed, followed by those irritative in contrast with allergic dermatitis.

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