PRESENCE AND IMPORTANCE OF SAPROPHYTE FUNGAL ORGANISMS ON DOG SKIN

ABSTRACT: Dogs are animals that are most often kept as pets in the cities. Their health problem may be the cause of infections of humans and animals. Skin changes and etiology factors present important segment of the diseases that disturb health of the pets.

The objective of this work was mycology examination of scarifications and skin swabs from dogs with clinical symptoms. The aim was to find out which fungi species can be isolated from the changed parts of the skin, and whether is possible that, besides dematophyte, saprophyte fungi from the environment may also be the cause of the changes, and to reveal their effect on the host.

During a one year period, 67 swabs and scarifications from dogs were examined to detect the presence of fungi. The samples were streaked on Sabouraud's dextrose agar and incubated for 10—21 days at 25°C. In microscopic examination according to their shape, and color, the colonies were identified as conidia, macroconidia and conidioaphora.

From 59, of total 67 samples, the following saprophyte fungi were isolated: Aspergillus sp., Penicillium sp., Alternaria sp., Mucor sp. and Fusarium sp. Occurrence of these fungi means that a considerable increase of this microbiological flora may be expected in homes of the owners. This may be the cause of systemic mycosis and allergies in animals and humans, as well as a possibility of contaminated food and incidence of mycotoxicosis.

KEY WORDS: fungi, dogs, mycosis, pets

INTRODUCTION

Changes on dog skin are frequent disorders. It is not easy to determine etiology and therapy. Skin is a large organ. Depending on animal species and age, it presents 12—24% of body mass (Aiello, Susan, 1998, Popović, N., Lazarević, M. 1999). Having in mind its size and a manifold role, it serves as a barrier and protection from the external factors and infective agents. It helps thermoregulation, produces pigments and vitamin D, contains receptors of all the senses (Popović, N., Lazarević, M. 1999). Every change influences its features and normal functioning. Changes on skin may
occur as a consequence of different biological agents, bacteria, fungi, parasites and viruses, but may also be a consequence of allergy, immunology disorders, endocrine disturbances, inborn diseases, environmental factors and nutritive deficits (Popović, N., Lazarovici, M. 1999).

Scope of our work was mycology examinations of scarifications and skin swabs taken from dogs with clinical symptoms. The aim was to determine what kind of fungi are present on the changed parts of the skin and see whether, besides dermatophyte, saprophyte fungi from the environment may also be the cause of changes important for the host.

MATERIAL AND METHODS

The samples originated from the dogs with different on skin changes. Clinical findings proved changes that ranged from dermatitis with amplified pigmentation and depigmentation, and to a red color change, petechia and ecchymosis. Itching, as a clinical finding, was not dominant, but loss of hair on fur was obvious, and on some parts it was total. There were 67 swabs and dog scarifications used also for other analyses (Cabanés, F. J. et al., 1996). The samples were streaked on Saboraud dextrose agar and incubated at 25 °C for 10—21 days. The colonies were identified on the basis of their shape and color; in microscopic analyses they were determined as conidia, macroconidia and conidiaphora (Quinn, J. P. et al., 2002).

RESULTS AND DISCUSSION

Presence of dermatophyte was revealed in 11.9% out of 67 examined samples. The identification proved that there was only one dermatophyte that belonged to Mycrosporum genus. Saprophyte fungi that do not belong to dermatophyte, were present in 95.6%. All the data on fungi in the examined samples are displayed in Table 1.

<table>
<thead>
<tr>
<th>Isolate</th>
<th>No. of examined samples</th>
<th>No. of positive samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mycrosporum sp.</td>
<td>67</td>
<td>8 (11.94%)</td>
</tr>
<tr>
<td>.aspergii u5 sp.</td>
<td>67</td>
<td>42 (62.69%)</td>
</tr>
<tr>
<td>Pemphigum sp.</td>
<td>67</td>
<td>40 (59.70%)</td>
</tr>
<tr>
<td>Ahymana sp.</td>
<td>67</td>
<td>45 (67.16%)</td>
</tr>
<tr>
<td>Mucor sp.</td>
<td>67</td>
<td>38 (56.71%)</td>
</tr>
<tr>
<td>Fiaaruan sp.</td>
<td>67</td>
<td>21 (31.34%)</td>
</tr>
</tbody>
</table>

Percentage of non-dermatophyte fungi was very high in our examination. They were also isolated in the samples that were dermatophyte positive. The analyses point out that only 4.4% of pure dermatophyte culture was isolated, but in all other findings the presence of non-dermatophyte fungi was also determined. Their presence was in some cases dominant, so it was not possible
to read the results and determine other fungi, among which there could have also been dermatophyte. According to the data in the paper (J a n d, S. K., Gupta, M. P. 1989) besides dermatophyte, in 10.8% of the cases, non-dermatophyte fungi were present, and they could be the cause of changes. The isolated species of non-dermatophyte fungi were similar to our findings (Alternaria sp., Penicillium sp., Aspergillus sp., Mucor sp., Cladosporium sp., Fusarium sp.). Our studies show that the incidence of saprophyte fungi on dog skin is not frequent. However, similar reports in the paper (C a b a n e s, F. J. et al., 1996) point out that the presence of non-dermatophyte in the samples from dogs is great and that, depending on the kind of the dog, Penicillium sp. is present in almost 90%. Findings of Fusarium solani on skin and submucous nodular changes, reported in the paper (K a n o, R. et al., 2002), and in lesions, warn of systemic fungi infection and its consequences. Saprophytic fungal organisms are widely spread in nature, and may be the cause of opportunistic infections of humans and animals. We can find reports (Evans. J. et al. 2004) on incidence of canine meningoencephalitis, caused by Fusarium solani. These systemic infections, caused by different saprophytic fungal organisms (Fusarium sp., Aspergillus sp.), were noticed even in other animals. The findings point out on possible consequences of infection with saprophyte fungi.

Undesirable influence of fungi on humans was noticed while examining the factors (Enriquez Palomec, O. et al., 1997) that provoke allergy. It was revealed that Candida sp. and Fusarium sp. present predominant etiologic agents of allergy in the dry season.

Saprophytic fungal organisms, that are widely spread in nature, are in daily contact with humans and animals. Pets carry them on their skin and increase the possibility of contaminating the homes they live in the influencing the humans too. Mycotoxins that present metabolic products of these fungi, may influence the organisms in different ways and cause damages of certain tissues and organs. This depends on toxins, quantity and time of exposure to the toxins. The consequences are damages on liver and kidney, damage of immune system and haemapoiesis organs, and carcinogen changes on organs (Karakašević, B., 1989). The researchs of reproductive disorders in female dogs in Poland (Golinski, P. K., Nowak, T., 2004) show that mycotoxins have a potential estrogen effect. It was revealed that dog food contained unsteroid mycotoxins, Zearalenone, whose activity was similar to that of an estrogen, and caused reproductive disorders in the examined female dogs, which was manifested in complex pyogenic endometritis (EPC).

CONCLUSION

Saprophytic fungal organisms are present on the changed parts of dog skin in a very high percentage (95.6%). The findings point out that larger number of different fungi are present, and that this may have health implications on both animals, and the owners.

Saprophytic fungi from the soil and the environment may be found on skin. Due to their specific features, they have negative influence on animal and
human health and cause system infection. Their products, mycotoxins, in a long run, exhibit negative effects on the health of all the beings exposed.

Pets in urban environment increase the exposure of humans and animals to saprophytic fungi organisms and cause health problems. All these facts should influence the decisions regarding pets and reducing the potential of risks.

LITERATURE


ПРИСУСТВО И ЗНАЧАЈ САПРОФИТНИХ ГЉИВИЦА НА КОЖИ ПАСА

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Резиме

Пси спадају међу најчешће гајене животиње у граду и здравствени проблеми везани за њих могу утицати на здравље људи. Промене на кожи паса и етиолошки фактори који их изазивају су важан сегмент болести које ремете здравље ове врсте кућних љубимаца.
Предмет нашег рада су миколошка испитивања скарификата и брисева ко-же паса који су имали клиничке симптоме болести. Циљ нам је да утврдимо које се врсте гљивица налазе на промењеним деловима коже пса и да ли се, поред дерматофита, и сапрофитне гљивице из околине могу сматрати узроком промена и какав је њихов значај за домаћина. У току годину дана анализирано је 67 узорака брисева и скарификата коже паса на присуство гљивица. За миколошка испитивања узети узорци су засејавани на Сабуро дектрозни агар и инкубирани на 25°C, 10—21 дана. Израсле колоније су идентификоване на основу њиховог изгледа и боје, а микроскопски у односу на грађу њихових конидија, макрокони-дија и конидијофора.

Од укупно 67 анализа код 59 је утврђено присуство сапрофитних гљивица и то: Aspergillus sp., Penicillium sp., Alternaria sp., Mucor sp. и Fusarium sp. Присуство ових врста гљивица на кожи паса значи да се у домовима власника може очекивати значајно повећање ове врсте микробиолошке флоре које могу бити узрокачи системских микоза и алергијских реакција људи и животиња, као и могући контаминенти хране и узроочници миктоксиноза.