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THE OCCURRENCE OF TRICHOPHYTOSIS AMONG PEOPLE AND CATTLE ON A FARM IN VOJVODINA, SERBIA

ABSTRACT: Dermatophytoses are frequent contagious fungal skin diseases that affect the skin of people and animals. Zoophile dermatophytes pose a significant problem for both human and veterinary medicine, and they are especially present among bovines. In this paper we showed a simultaneous occurrence of trichophytosis among professionally exposed people and bovines on a farm in Vojvodina, Serbia. The tested samples (skin scrapings and hair) originating from people and animals, were positive for *Trichophyton verrucosum* dermatophyte which was determined by applying a direct microscopic examination of the smears, as well as the isolation and identification of the agents.

KEY WORDS: Bovines, dermatophytosis, people, trichophytosis, *Trichophyton*

INTRODUCTION

Dermatophytoses are frequent contagious fungal diseases that affect skin of people, animals and rarely birds (S a r g i s o n et al., 2002; C h e r m e t t e et al., 2008). These diseases are widespread around the world. The zoophile sorts of dermatophyte predominantly infect animals which become reservoirs of these agents, although sometimes the presence of geophile and anthropophile dermatophytes can be registered. Dermatophytes are represented by

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askomycetes that possess both keratophile and keratinolytic characteristics. A dominant sort of dermatophyte among bovines and other ruminants is *Trichophyton verrucosum* from the *Arthrodermataceae* (Chermette et al., 2008). A special problem for public health is seen in the capacity of the fungi *T. verrucosum* to infect people (Papi ni et al., 2009). Fungal infections of skin and nails are the most frequently reported among people. It is considered that one quarter of the population on this planet has superficial mycoses. The frequent dermatomycoses among people is more often noticed in the communities of lower social and economic status, i.e. among those with inadequate hygiene habits, as well as among people who have frequent and repeated direct contacts with the infected skin of animals (Havlic kova et al., 2008). Data collected in Serbia on the infections of people and animals caused by dermatophytes are scarce, although these diseases are quite frequent. Potk onj a k et al. have recently shown epizootological and clinical characteristics of the bovine infection with *T. verrucosum* on a bovine farm in the Autonomous Province of Vojvodina (Potk onj a k et al. 2011). The aim of this paper was to point to a simultaneous occurrence of the infection of people and bovines on a farm in Vojvodina, Serbia, with *T. verrucosum* being an agent.

MATERIAL AND METHODS

Total of 12 people and 566 animals were clinically examined and the sampling was performed at the same time. Out of 6 people with skin changes, which indicated a fungal infection, skin scrapings were taken from the edge of the efflorescence, previously processed with 70% alcohol. Out of the 20 bovines with clinical changes which indicated a fungal infection, hair samples and skin scrapings were collected from the edge of the efflorescence, previously processed with 70% alcohol. Regarding the laboratory testing, first a direct microscopic examination of the samples of hair and skin scrapings was done. The smears of these materials were prepared in a 10% solution of potassium hydroxide and in chlorlactophenol, and with multiple, brief exposure to open flame. The examination of the prepared smears was performed with a light microscope, magnification 400x, in order to identify the potential presence of arthroconidia. At the same time, a cultivation of bovine hair samples and bovine and human skin samples took place in the Sabouraud dextrose broth with chloramphenicol (Himedia Laboratory), at different temperatures (25° C and 37° C) during a four-week period. The identification of the grown colonies was done based on the growth rate, macroscopic and microscopic characteristics, urease test, and specific nutritive requirements for growth. A solution of lactophenol cotton blue (Himedia Laboratory) was used to examine microscopic features of the grown colonies and to stain the dermatophytes, while *Trichophyton* agar 1-7 (Difco™) was incubated at room temperature during a two-week period (Robert and Pihet, 2008).

RESULTS

A direct microscopic examination of the samples of bovine hair and skin scraping samples taken from people and bovines, proved an overwhelming presence of arthroconidia producing ectotrix chains. After 12 days of incubation at a temperature of 37° C, substantial, round whitish cobweb-like colonies incorporated into the foundation, which corresponded to trichophyton, while similar smaller colonies grew only after the third week of cultivation at a temperature of 25° C (Fig. 1). Using the microscope to examine a smear from the culture stained with diluted lactophenol cotton blue irregular and septate hyphae were noticed (Fig. 2). The urease test was negative for the isolated trichophyton sorts. Trichophyton agars number 1 and 2 did not grow, while mild increase was detected in test tubes number 4, 5 and 7. Satisfactory increase in the tested culture was observed in the trichophyton agar number 3, with additional inositol and thiamine. The colonies that grew on the Sabouraud dextrose broth with chloramphenicol were identified as *Trichophyton verrucosum*.

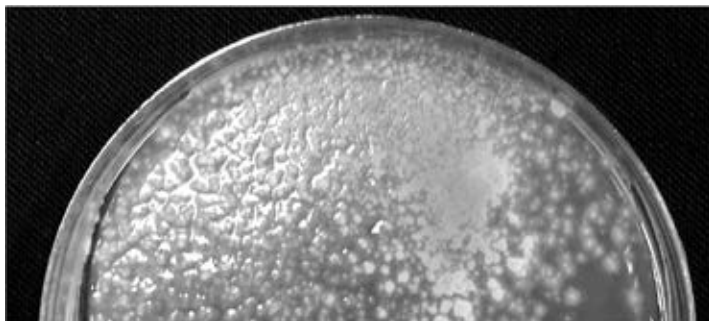


Fig. 1. – Appearance of *T. verrucosum* colonies grown on Saburo dextrose agar with chloramphenicol



Fig. 2. – Appearance of *T. verrucosum* hifa stained with lactophenol cotton blue

The analyzed material from all 6 patients proved the presence of the agent *Trichophyton verrucosum*. All the patients had characteristic efflorescences which were described as “red lumps” (Fig. 3). Material taken from bovines proved that all 20 of them were infected with *T. verrucosum*, and typical efflorescences were: grey-white, round with a desquamate, elevated, bordered, localized predominantly on the head and the neck (Fig. 4).



Fig. 3. – Appearance of efflorescence on human arm caused by *T. verrucosum*



Fig. 4. – Appearance of efflorescence on calf head caused by *T. verrucosum*

DISCUSSION

A g h a m i r i a n reported that zoophile dermatophytes pose a significant problem for human and veterinary medicine, and that they are especially present among bovines. In recent years, especially during winter, an increase

in the incidence of the infection with this agent has been reported among animals, and the most frequent reported agent is *Trichophyton verrucosum* in bovines, which is transferred to people via direct contact (Aghamirian and Ghiasian, 2011). Recently, clinical picture of dermatomycoses in people caused by zoophile dermatophytoses has been changed due to the inadequate immune response of the host, so granulomatose changes have been registered as well as invasive or deep mycoses, changes similar to mycetoma caused by *M. canis* and the ever increasing infections caused by agent *T. verrucosum* (Chermette et al., 2008). Papini reported a widespread infection caused by *T. verrucosum* in the rural area and added that it is frequently registered among cattle growers (Papini et al., 2009). Néji et al. isolated the agent *T. verrucosum* in 178 patients, which corresponded to 1.2% of all the registered dermatophytoses (Néji et al., 2011). Maslen reported that agent *T. verrucosum* was in most cases isolated from the materials originating from people who were at a professional risk of infection (farm workers or cattle slaughterhouses), or from children who lived on farms and were in direct contact with the infected bovines (Maslen, 2000). Nenoff said that each occurrence of infections caused by *T. verrucosum* and *T. erinacei* should be reported to the scientific and professional public (Nenoff et al., 2012).

CONCLUSION

In this paper, we have pointed to a simultaneous infection of people and bovines on a farm in AP Vojvodina, Serbia. Each occurrence of zoophile dermatophytes among animals can be expected to be followed by a simultaneous occurrence of the infection of directly exposed persons. Further epidemiological research, strict application of general prophylaxis, as well as vaccination of bovines are necessary in order to eradicate the source of this zoonosis.

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ПОЈАВА ТРИХОФИТОЗЕ КОД ЉУДИ И ГОВЕДА НА ФАРМИ У ВОЈВОДИНИ, СРБИЈА

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Резиме

Дерматофитозе представљају честа, контагиозна, гљивична обољења коже људи и животиња. Зоофилне дерматофите представљају значајан проблем у хуманој и ветеринарској медицини, а посебно су присутне код говеда. У раду смо приказали истовремену појаву трихофитозе код професионално експонираних људи и говеда на фарми у Војводини, Србија. У узорцима достављеним на испитивање (скарификати коже и длака) пореклом од људи и животиња, применом директног микроскопског прегледа препарата, као и изолације и идентификације узročника, идентификовано је присуство дерматофите *Trichophyton verrucosum*.

КЉУЧНЕ РЕЧИ: дерматофитоза, говеда, људи, *Trichophyton*, трихофитоза