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A Survey on Pityriasis Versicolor in the University Students in Southeast of Iran

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Abstract: The present study was aimed to determine the prevalence of pityriasis versicolor in the university students in Southeast of Iran. Clinical examination conducted and Wood's light (260-2600 A° UV light) utilized on 800 volunteer students including 400 males and 400 females. Consequently, the students presenting any macular lesion subjected to further examinations including direct smears, sellotape and culture methods for identification of *Malassezia* species. Pityriasis versicolor was clinically determined in 159 (39.75%) male and 179 (44.75%) female students. Wood's light examination was positive with yellowish-golden demonstration, in 32.5% of males and 39.5% of females, indicating the involvement of Pityriasis versicolor and *Malassezia* species. Direct examination and culture results demonstrated 84.50 and 80% positive, respectively. The study confirmed a high prevalence of pityriasis versicolor in the students living in university dormitories. This infection, therefore, should be noted as an important public health problem in the study area, particularly, where students live together. Also, the pathogenic consequences of *Malassezia* species and its predominant involvement in pityriasis versicolor should be considered.

Key words: Pityriasis versicolor, Zahedan, Iran

INTRODUCTION

Pityriasis Versicolor (PV) is a chronic or mild infection of the stratum corneum. The lesion are characterized by a branny or furfuraceous consistency; they are discrete or concrescent and appear as discolored or depigmented areas of the skin. The affected areas are principally on the chest, abdomen, upper limbs and back. The etiological agents are the lipophilic yeasts, *Malassezia* species (Schwartz, 2004). Yeasts of the genus Malassezia are known to be members of the skin microflora of human and other warm-blooded vertebrates (Midgley *et al*., 1998; Leeming *et al*., 1989). These lipophilic yeasts are associated (Gupta *et al*., 2002), with various human diseases, especially PV, a chronic superficial scaling dermatomycosis (Fitzpatrick and Johnson, 2001). This disease is common in late teens and young adults of both sex and characterized by well-demarcated scaling patches with variable pigmentation PV was described at the beginning of nineteen century (Eichstedt, 1846). The genus of Malassezia has undergone several taxonomic revisions (Midgley *et al*., 1998). In the last reclassification by Gueho *et al*. (1996) seven distinct species were recognized within this genus, namely *M. furfur*, *M. pachydermatis*, *M. sympodialis*, *M. globosa*, *M. obtusa*, *M. restricta* and *M. slooffiae*. Recently, four more species have been identified, *M. dermatis*, *M. japonica*, *M. yamatoensis* and *M. nana* and *M. furfur* has long been identified as the causative fungus of PV (Morishita *et al*., 2006).

Pityriasis versicolor (Tinea versicolor) has worldwide occurrence, its frequency is variable and depends on different climatic, occupational and socio-economic conditions (Borelli *et al*., 1991). PV has been reported to be common in different communities, in particular the crowded places like

dormitories. It has been studied in a variety of different geographical areas. Previous survey in Tehran-Iran showed high prevalence of PV, are due to these lipophilic yeasts Tarazooie *et al*. (2004). The present study was aimed to determine the prevalence of PV in the university students in Southeast of Iran and identification of the causative agents, *Malassezia* species.

MATERIALS AND METHODS

Eight hundred university students, including 400 males and 400 females accommodated in a number of university dormitories in Zahedan, Southeast of Iran, were randomly in October 2006-2007 selected. A questionnaire was used to collect the required information from every individual subject. Consequently, the clinical observation, wood's lamp test (260-2600 A° UV light) and mycological examinations were performed to confirm the diagnosis of pityriasis versicolor and the fungal species. Specimens were taken by scraping the lesions with a sterile scalpel.

Direct microscopy with 20% KOH and methylene blue staining were carried out for those with clinically assigned PV lesions. All samples were also inoculated in plates containing modified Dixon medium. The plates were incubated at 31°C for two weeks and examined at frequent intervals for observation of developing colonies (Tarazooie *et al*., 2004). A number of 200 male and female students (100 each) who were shown healthy (without any dermatosis) at physical observation, were also subjected to the mycological examinations as described above. Superficial skin samples were taken by sellotape from these normal students as well as the cases with no sufficient scales.

RESULTS AND DISCUSSION

The screening observation resulted in demonstration of pityriasis versicolor in 42.25% of the 800 investigated students; it was 39.75% in male and 44.75% in female students with no significant difference (Table 1). The Wood's lamp test was positive (showing golden yellow) in 32.5% of males and 39.5% of females, with no significant difference (Table 1). The most affected areas were the trunk and neck. The average age of the students was 20±3 years. The highest prevalence of PV 60% was seen in the student with 20-21 years of age. Misdiagnosis of PV demonstrated 7.25 and 5.25% in male and female by wood's lamp test comparing to the direct examination method. Direct examination and culture results of specimens was positive in 84.5 and 80% yielded *Malassezia* species, respectively (Table 2). A proportion of 86.5% of the positive specimens from PV lesions, presented hyphae together with budding yeasts. The laboratory examination of the specimens obtained from healthy students (control groups), showed for direct examination and culture, 30% PV and 25% *Malassezia* spp., respectively (16% females and 14% males).

The present study demonstrated a high prevalence of PV in the university students in Zahedan, Southeast of Iran. There was no association between sex and the rate of infection. This is similar to the

Table 1: The rate of pityriasis versicolor infection in the university students in Zahedan, Southeast of Iran

Method	Male (n = 400) No. (%)	Female (n = 400) No. (%)	Total (n = 800) No. (%)
Clinically positive	159 (39.75)	179 (44.75)	338 (42.25)
Wood's light positive	130 (32.50)	138 (39.50)	268 (33.50)

Table 2: The results of laboratory examination of pityriasis versicolor cases screened from the university students in Zahedan, Southeast of Iran

Method	Positive No. (%)	Negative No. (%)	Total No. (%)
Direct examination	286 (84.5)	52 (15.5)	338 (100)
Culture method	272 (80.5)	66 (19.5)	338 (100)

results obtained from a previous survey in Tehran, Iran, that showed a high prevalence of Pityriasis versicolor, in which almost 6% of all dermatosis and approximately 30% of dermatomycoses were found to be due to these lipophilic yeasts, *Malassezia* species (Tarazooie *et al*., 2004). Although the Pityriasis versicolor is a worldwide prevalent infection, it is variable in different areas and depends on climatic, occupational and socio-economic conditions (Borelli *et al*., 1991).

The highest rate of PV infection was seen in the students aged 20-21 years. The studied subjects were in a restricted range of ages (20±3 years) as they were of the student community, but other investigations also had presented similar results (Midgley *et al*., 1998; Crespo Erchiga *et al*., 1999a; Gupta *et al*., 2001a; Tarazooie *et al*., 2004), suggesting that the peak of the infection is coincided with ages when the sebum production is in the highest level. Although 60% of patients in age range of 10-20 years were female, this proportion was reversed in the age group 20-30. Lower maturity age in female compared with male can be considered as the possible reason of this dissimilarity. Pityriasis versicolor is uncommon in children (Gupta *et al*., 2001b).

The present study showed insignificant difference in PV infection between male and female. The role of sex in propensity to development of PV is still unclear and is the subject of discrepancy. Some studies found that PV is more common in men (Belec *et al*., 1991; Nakabayashi *et al*., 2000); whereas, others reported a higher incidence of the infection in women (Crespo Erchiga *et al*., 1999b; Gupta *et al*., 2001a, b; Crespo Erchiga and Delgado Florencio, 2002; Gaitanis *et al*., 2006), which may be due to extra attention of women to their beauty and skin hygiene. Also there are reports indicating no significant differences of PV between sexes (Crespo Erchiga *et al*., 1999a; Fitzpatrick and Johnson, 2001; Gupta *et al*., 2001a, b).

Although *Malassezia* species are considered as normal microflora of the human skin, these lipophilic yeasts are associated with many skin disorders in particular PV, in some circumstances. It is widely believed that endogenous factors such as administration of corticosteroids, malnutrition and increased plasma cortisol level are involved with the development of PV (Boardman and Malkinson, 1962; Borelli *et al*., 1991; Gupta *et al*., 2001a, b). Besides, the role of high temperature and humidity in this condition is well established (Faergemann, 1989; Midgley *et al*., 1998). In this regard, no significant differences were observed in culture results of students PV caused in comparison with controls. Similar to other investigations (Ashbee and Evans, 2002; Gupta *et al*., 2001a, b).

In this survey, the most affected areas were the trunk and neck, which is concordant with most of the previous studies (Gupta *et al*., 2001a, b). The distribution of *Malassezia* species on back and chest is parallel with the density and activity of pilocebaceous glands in these areas. Similar to previous studies (Gupta *et al*., 2001b), we found no statistical difference in the distribution of *Malassezia* species on various body sites.

Diagnosis of PV is generally simple and lies on the clinical manifestations and microscopic examinations of the lesions (Crespo Erchiga and Delgado Florencio, 2002). In the direct examination, 84.50% of PV samples yielded positive results, which is the same as the results reported by Crespo Erchiga *et al*. (1999b). Two cases with negative results in this study had also been received topical antimycotic treatment. Significant difference was obtained between the sensitivity of the preliminary test, wood's lamp (72%) and that of direct examination (84.50%). It can probably be attributed to the condition of the subjects on the day of sampling, i.e., receiving antibiotic treatment or possibly taking shower.

In 86.2% of positive cases of PV, classical feature so-called spaghetti and meatball forms were seen. Present results are consistent with those previously published and confirm the significance of the yeast-mycelium conversion in pathogenesis of this infection (Crespo Erchiga *et al*., 2000; Crespo Erchiga and Delgado Florencio, 2002; Crespo Erchiga and Florencio, 2006). Regarding high sensitivity and acceptable specificity of direct examination, diagnosis of PV is based on observation of short hyphae and yeast in the scales. However, in cases that only hyphae were presented in the

scales, direct examination of samples with KOH, especially by unskillful technicians, may fail to reveal the infection. Hence, we suggest staining the scales prior to performing light microscopic examination to avoid false-negative results.

Culture is necessary to distinguish the *Malassezia* species by morphological and physiological methods. In the present study, the recovery rate of *Malassezia* species from the PV lesions was 80%, which was mostly comparable to recent study by Nakabayashi *et al*. (2000). But, it was higher than that of some previous studies (Midgley, 2000; Gupta *et al*., 2001b; Sugita *et al*., 2001; Dutta *et al*., 2002). The difference may be due to the fact that margin of the PV lesions might be used to collect specimens. However as it was shown by Crespo Erchiga *et al*. (2000) unlike other dermatomycosis, center of the PV lesions yields more viable materials for culture. Hence, we scraped center of the lesions instead of the borders to increase recovery rate of the organism and avoid isolation of surrounding commonsal species (Midgley, 2000; Crespo Erchiga *et al*., 2000; Crespo Erchiga and Delgado Florencio, 2002).

Malassezia species are members of the normal skin flora and can be recovered from different sites of the body especially the sebaceous-rich areas. In healthy skin, we found *Malassezia* species by direct examination and culture with the frequency of 30 and 25%, respectively. These rates of positive results in our study are lower than those from recent study of Gupta *et al*. (2001a) and may suggest the difference in sampling method and culture medium. In this survey, similar to other studies (Sugita *et al*., 2001; Aspiroz *et al*., 2002; Tarazooie *et al*., 2004).

It was concluded that pityriasis versicolor is highly prevalent in the students living in university dormitories indicating an important public health problem in the study area, particularly, where students live together. Also, the pathogenic consequences of *Malassezia* species and its predominant involvement in PV should be considered.

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