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ORIGINAL ARTICLE

Prevalence of pityriasis versicolor in a group of Italian pregnant women

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Abstract

Background Although a predisposing role of pregnancy to *Malassezia* infections is referred, data on the prevalence of pityriasis versicolor (PV) in pregnant women are not available in literature.

Objective To investigate the frequency of PV during pregnancy, 60 pregnant women were clinically and microscopically investigated during and after pregnancy.

Results Fifty-two women completed all visits; three women were affected by PV at first or third trimester of pregnancy, and none at 6 months after delivery. Colonization due to *Malassezia* yeasts was very significantly ($P < 0.01$) or significantly increased ($P < 0.05$) at the third trimester and 6 months after delivery, respectively. No variation was observed between the end of pregnancy and the postpartum ($P > 0.05$).

Conclusion Frequency of PV during pregnancy (5.7%) does not seem different from that reported in general population living in temperate climates (2–5%). However, higher degree of colonization by *Malassezia* resulted at the end of pregnancy and postpartum.

Introduction

Pityriasis versicolor (PV) is a common chronic-relapsing superficial mycosis due to yeasts of the genus *Malassezia*; it usually affects sebum-rich areas of adolescents and young adults. *Malassezia* yeasts are a part of the normal skin flora;[1] however, several factors may favour their proliferation and transition into pathogen; endogenous factors include genetic predisposition, sebaceous hypersecretion, hyperhydrosis, congenital or acquired immune depression, and endocrine disorders.[2,3] The higher incidence of PV in the tropics than in temperate areas highlights the importance of environmental humidity and warmth as predisposing exogenous factors. Although a predisposing role of pregnancy to *Malassezia* infections, including PV and pityrosporum folliculitis (PF), is referred,[2,4] data on the prevalence of PV in pregnant women are not available in the literature. The aim of the present study is to prospectively investigate the frequency of PV in a group of pregnant women.

Materials and methods

From June 2001 to July 2002, 60 white women in the first trimester of pregnancy (6th to 12th week of gestation) were consecutively seen at the Department of Obstetrics and Gynaecology and sent to our Department of Dermatology for enrolment in the present study. Informed consent was obtained at the beginning of the observational period. The data were collected longitudinally until October 2003. All women were asked to avoid taking a shower in the 12 h preceding the examination. At the first visit (V_1), detailed cutaneous examination was done.

Clinical signs (erythema, hypopigmentation or hyperpigmentation, scaling, and follicular papules) and symptoms (itching) of PV lesions were scored from 0 to 3 (0, absent; 1, slight; 2, moderate; 3, severe). The entity of the involved area was scored referring to the percentage of the entire trunk [0, no lesions; 1, < 5% (slight); 2, 5–20% (moderate); 3, > 20% (severe)]. Wood's lamp examination was also done on the trunk (0, no fluorescence;

Table 1 Clinical and mycological findings of 52 pregnant women

Time of observation		V_1: 7th–12th week of pregnancy (mean ± SD, 9.76 ± 1.9), *n*	V_2: 31st–37th week of pregnancy (mean ± SD, 35.36 ± 1.3), *n*	V_3: 5th–8th month after delivery (mean ± SD, 6.05 ± 0.6), *n*
Clinical examination	Positive	2	3	0
	Negative	50	49	52
Microscopy*	0	35	26	21
	1	8	6	16
	2	7	17	15
	3	**2**	**3**	**0**
Fluorescence at Wood's lamp	Positive	2	2	0
	Negative	50	50	52

*0, absence of fungal elements; 1, few and isolated spores, < 10 in a 200x field; 2, spores in groups; 3, pseudohyphae and spores. Microscopical findings of women with PV are highlighted in the grey box.

1, evident fluorescence). Potassium hydroxide (10%) preparation for microscopic investigation was made on skin scrapings taken from the upper middle back if lesions were clinically absent or from suspected PV lesions.

After observation at 200× magnification, the results were defined: (0) absence of fungal elements, (1) few (< 10) and isolated spores in a field, (2) spores in groups, (3) pseudohyphae and spores. Clinical and microscopic examination were repeated at the third trimester of pregnancy (V_2) and about 6 months after delivery (V_3). The Wilcoxon two-sided test (significance for $P < 0.05$) was done by statistical package SYSTAT 11 (Systat Software, Inc., Point Richmond, CA, USA). A possible climatic effect has been tested by means of binary logistic regressions for each of the three control times. The seasonal times have been classified in two periods of cool (from October to April) and warm (from May to September) climate.

Results

Fifty-two women completed all visits; their age ranged from 26 to 41 years (mean ± SD, 32.9 ± 3.7). Clinical and mycological results are summarized in Table 1. Among the nine women (17%) who referred a previous episode of PV, two were clinically and microscopically positive for PV at V_1. Lesions were located on the trunk, and their extension was light to moderate. Both women were treated with dermatological soap containing 1.5% ciclopiroxolamine once a day. The product was left on the wet skin for 5 min and then washed off. Two weeks later, skin lesions had improved, noticeably in one case and partially in the second. However, spores with pseudohyphae were still present at microscopic examination. Topical treatment was continued for a further 2 weeks; after this period, clinical and microscopic cure were reached in one case, whereas the second patient did not come to the additional control visit. At the end of pregnancy, both women presented a relapse of PV. A third women developed PV only at the end of pregnancy (V_2). Topical antifungal treatment, as described above, was done for 1 month. Six months after delivery, none of the affected women had clinical evidence of PV, and microscopy on skin scraping showed a moderate degree of presence of *Malassezia*. In the remaining 49 cases, microscopic examination showed *Malassezia* yeasts in 17 women (32%) at V_1, in 26 women (50%) at V_2, and in 31 women (59.6%) at V_3.

The microscopic score related to colonization by *Malassezia* yeasts was very significantly increased between the first (mean, 0.54) and the third trimester (mean, 0.94) of pregnancy (V_1 vs. V_2, $P = 0.004$) and was still significantly increased (V_1 vs. V_3, $P = 0.011$) between the first trimester of pregnancy and 6 months after delivery (mean, 0.88). No variation was observed between the end of pregnancy and the after delivery (V_2 vs. V_3, $P = 0.608$).

An influence of warm temperature was registered only in V_1 with an odds ratio (OR) of 4.4 ($P = 0.03$); the following observations seem not to be influenced by climate (V_2: $P = 0.61$; OR, not significant; V_3: $P = 0.27$; OR, not significant).

No women showed PF at any time of study. Among the eight women who did not completed the study, two miscarried at the 11th week of pregnancy, whereas six other women abandoned the study before it ended and did not come to the second or, in one case, to the third visit; none of these women presented PV at V_1 or V_2.

Discussion

Depending on environmental conditions, prevalence of PV varies between 1% and 5% of the population in temperate climates to 30% to 40% in the tropics.[5]

Because of their lipid requirements, *Malassezia* yeasts cause PV more frequently in post-puberty and youth due to a higher sebaceous gland activity, stimulated by hormonal influences.[5] A possible relationship between pregnancy and *Malassezia* skin infections has been supposed, but no conclusive evidence is available in the literature, making this issue still unclear and, in some cases, controversial.[4,6,7] Among the reported pregnancy-related skin changes, increased sebaceous glandular activity could be a factor that favours *Malassezia* infections.[4] Objective data on glandular sebaceous activity in pregnant women are limited. Henderson *et al*. measured sebum excretion rates before and several weeks after delivery, showing higher values at the end of pregnancy in only 3 of 10 mothers.[8] In addition, the described increase of eccrine glandular activity, thought to be related to the increased thyroid function, may predispose to PV.[4] Moreover, it has been hypothesized that luteinizing hormone and human chorionic gonadotropin may regulate steroidogenic enzymes and play a part in thermoregulation through sweating.[9] Another factor predisposing to skin infections during pregnancy has been identified in the immunosuppressive effect of high serum levels of oestrogens.[10] An immunosuppressive status, to prevent foetal rejection, has been shown in animal models, consisting of a relative reduction in T lymphocytes and increase in B lymphocytes. The impairment of skin immunity involves cell-mediated response through a decrease of Langerhans cells in the epidermis, a reduction of both neutrophil function and natural killer cell activity.[11]

In spite of the different factors that potentially favour *Malassezia* infections during pregnancy, epidemiological data on the occurrence of PV are lacking.[6] Although it is reported that PF occurs most frequently in pregnant women,[4] only two cases of PF have been reported during pregnancy.[7,12] The prevalence of PV in our selected group of pregnant women (5.7%) was no higher than that reported in general population in Italy (2–5%).[13,14] Therefore, pregnancy does not seem a favouring factor for the development of PV. However, a higher degree of colonization was found by microscopic observation at the third trimester of pregnancy and still persisted after the delivery.

In our series, a relationship between warm temperature and increased colonization was found only in the first trimester of pregnancy. Probably a larger sample is needed to investigate the climatic effects during pregnancy. The pregnant women affected by PV required a very long topical treatment to achieve mycological and clinical cure, but they were disease-free 6 months after delivery. Pregnancy may perhaps favour, through the immunological and/or endocrine mechanism cited above, an increased colonization, which remains below the threshold of the clinical manifestation or, in genetically predisposed women, can lead to the disease. These or other favouring conditions could act even during the months following delivery, but evidence on this are lacking in the literature. In conclusion, in our study, pregnancy does not seem to increase the frequency of PV or PF. However, higher degree of colonization by *Malassezia* yeast resulted at the end of pregnancy and persists even postpartum. Other case–control studies could clarify whether changes in sebum excretion rate or sweating during and after pregnancy may influence the proliferation of *Malassezia* spp. on human skin. Phenotypic or genetic methods, like quantitative culture and/or molecular techniques,[15,16] could also be employed in the identification of a specific pattern of colonization the skin of pregnant women.

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