

The Skin as the Possible Reservoir for *Candida albicans* in the Oculo-cutaneous Candidiasis of Heroin Addicts

PHILIP ELBAZE¹, JEAN PHILIPPE LACOUR², JACQUELINE COTTALORDA¹, YVES LE FICHOUX³,
and JEAN PAUL ORTONNE²

Departments of ¹Bacteriology and ²Dermatology, Hôpital Pasteur, and ³Departement of Mycology, Hôpital de Cimiez, Nice, France

We describe 2 patients who injected themselves with the same brown heroin a few days before hospitalization. The first patient presented with characteristic oculo-cutaneous candidiasis. Blood samples remained sterile during the so-called 'septicemic syndrome' which represents the first phase of this syndrome and were positive for *Candida albicans* only when cutaneous nodules developed. The second patient was hospitalized for a stomach perforation and had no cutaneous or ocular candida involvement. Both patients were unusually colonized by *C. albicans* on their skin (particularly on hairy zones). These observations support the hypothesis that the skin may constitute the reservoir for *C. albicans* in oculo-cutaneous candidiasis. Key words: Folliculitis; Septicemia.

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P. Elbaze, Laboratoire de Bactériologie, Hôpital Pasteur, BP 69, 06002 Nice Cedex, France.

In recent years, outbreaks of candidiasis with an unusual presentation have been reported in heroin addicts (1–3). Skin (deep-seated scalp nodules and folliculitis in hairy zones), and eye lesions (mainly chorioretinitis) developed sequentially within 10 days of injection of brown heroin. The origin of the yeast is not well understood. Street drug, syringes and lemon juice used by some addicts to solubilize the drug have been suggested as the possible source of infection (4).

Attempts to cultivate *C. albicans* in these have been generally unsuccessful. Another possibility is that the micro-organism spreads hematogenously from a gastrointestinal source (2). However, none of these hypotheses is satisfactory. Moreover, the sequential development of candida lesions, the incidence of ocular involvement and the exclusive responsibility of *C. albicans* for this syndrome are not explained.

We describe here 2 patients who injected themselves with brown heroin from the same source. The skin of the first patient, who developed oculo-cutaneous candidiasis, and of the second patient, who remained free of cutaneous and visceral candidal lesions, was unusually colonized by *C. albicans* especially on hairy zones. These observations support the hypothesis that the skin itself is the reservoir of candida infection.

CASE REPORTS

Case 1

A 22-year-old woman with a 5-year history of heroin abuse was hospitalized for hyperthermia (39°C), shivers and profuse sweating 24 h after an injection of brown heroin from Iran. Numerous hemocultures were performed which remained sterile during this period. Physical examination and blood tests were normal. The hyperthermia dis-

appeared after the first day of hospitalization. Three days later while she was still in the hospital, multiple, painful erythematous nodules, 1–2 cm in diameter, developed very suddenly (less than 24 h) on the scalp and in the left axilla. She also had numerous pustules on the scalp and in the left axilla. Blood samples performed the same day showed the presence of *C. albicans* (two samples), which was also isolated from a skin biopsy of the scalp and from both axillae (samples taken with damp cotton wool swabs). Other regions remained free of *C. albicans*. She had no buccal or genital involvement. Funduscopic examination revealed right paramacular retinal involvement. Serological testing for *Candida* gave titres of 1/1280 by indirect immunofluorescence test and 1/4 by Candtec® test. She was positive for the HIV; CD₄ lymphocytes were 750/mm³. The patient had costal and right foot pain, but X-rays and scintigraphy were normal. She was treated successfully with intravenous amphotericin B and flucytosine.

Case 2

A 28-year-old female, friend of the first patient, who had taken heroin of the same origin some days after the first patient, was hospitalized for a perforation of a gastric stress ulcer. She had a 15-day history of heroin abuse (two injections) and had no fever and no cutaneous or ocular signs on admission. The patient did not use oral contraceptive agents. Daily samples were taken from the whole skin surface with damp cotton wool swabs, looking for colonization with *C. albicans*. On the first day *C. albicans* was isolated from the vagina and pubic region, without visible skin lesions, but not from other areas. Within 3 days the yeast was progressively found on all skin surfaces, in particular the hairy areas (pubis, axillar, scalp) but also on the abdomen and shoulders. Only the extensor surfaces of her limbs were not covered with *C. albicans*. There were no visible cutaneous lesions or fever, but the patient was perspiring profusely. On the fifth day she complained of scalp pain but had neither scalp nodules nor eye infection. The patient was discharged after 10 days without any other problems, *C. albicans* was not present on the skin surface one month later. Serum HIV tested during hospitalization proved negative. She had no other abnormal biological findings. The different strains of *C. albicans* of the 2 patients were not stored and no serological or DNA restriction fragment analysis could be performed.

DISCUSSION

The origin of cutaneous lesions in heroin addicts with oculo-cutaneous candidiasis is generally supposed without proof to be hematogenous (1–3) and the initial hyperthermic syndrome associated with this disorder is generally considered to be a 'septicemic' syndrome (2). We believe that the clinical signs presented by these patients (elevated temperature, headache, myalgia and profuse sweating) a few hours after injecting heroin could in fact correspond to a 'toxic syndrome' and not to septicemia. This clinical picture is relatively common in a milder form in addicts who inject themselves with heroin, particularly when they use brown heroin from Iran (3). In fact we were unable to find any report of candidemia during this phase and our first patient had no positive blood cultures during this period. Moreover, specific localization of the cuta-

neous signs on hairy zones is difficult to explain by metastatic localization of *Candida* septicemia. In fact, previous cutaneous regional colonization by a pathogen best explains a specific localization on the skin during 'sepsis' as the preferential apocrine localization of *Pseudomonas aeruginosa* ecthyma gangrenosum (5). *C. albicans* is said to be on skin and particularly on hairy zones, but such localization on the scalp is well known during chronic muco cutaneous candidiasis and a few cases of *Candida* folliculitis or nodules on the face have been described (6-7). This hypothesis is supported by the fact that our 2 patients had *C. albicans* on their skin. Moreover, we were able in the second patient to follow the progressive colonization of the skin by *C. albicans* after the injection of heroin - and then its disappearance.

The colonization by *Candida* could be explained in part by the profuse sweating which seems to be frequently induced by this kind of drug, especially on these areas (2-3). The rapid development of nodules secondary to folliculitis is probably due to the depressive action on cellular immunity of heroin (8). Moreover, it seems that brown heroin from Iran may have a specific depressive action on cellular immunity directed against *C. albicans* (9). The hypothesis of a cutaneous source for *C. albicans* offers a good explanation for the fact that only *C. albicans* was cultured during this syndrome and not other *Candida* species usually found in classic candidemia of drug addicts, because only this species has in fact been described as causing folliculitis (6).

In our hypothesis the ocular involvement in oculocutaneous candidiasis is due to invasion of the regional blood stream from scalp nodules. It is well known that the injection of drugs in the temporofrontal areas can occasionally induce homolateral loss of vision (10-11). The ocular involvement is explained in these cases by anastomotic circulation between the cutaneous branch of the superficial temporal arteria skin vessel and the central artery of the retina.

In conclusion, our observations support the hypothesis that

the reservoir of *C. albicans* during oculocutaneous candidiasis is the skin itself. This hypothesis explains the sequential feature of this syndrome.

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