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**A broad spectrum of presentations of scabies in the HIV-infected population**

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HIV infection poses a global threat today. An estimated 36, 9 (34,3-41,4) million people are living with HIV/AIDS, and there are some 2 (1,9-2,2) million new infections each year. Every day, more than 6800 people become infected with HIV and more than 5700 die, mostly because they have no access to HIV prevention, treatment and care services. More than 39 million people worldwide died from diseases that developed on the background of Acquired Immunodeficiency Syndrome [1]. According to WHO / UNAIDS Ukraine continues to be a region with high levels of HIV in Central Asia and Eastern Europe [2]. During 1987-2016 among the citizens of Ukraine 287,968 HIV - positive people were registered including 88,075 AIDS cases and 39,885 deaths from AIDS-related diseases [3].

One way to combat the spread of infection is early detection and treatment of people with HIV/AIDS, especially in the early stages of the disease when there is a change in the general state of the infected person. However, there are characteristics of infections which cause changes in the skin that are most accessible to visually review and diagnose. Therefore, knowledge of dermatological manifestations of HIV/AIDS is a necessary aspect to physicians of any specialty for early diagnosis and timely treatment of this serious disease.

HIV infection is characterized by a long course which is clinically associated with progressive decline in immunity. HIV has no specific pathognomonic signs, however, good epidemiological history and carefully conducted physical examination of the patient enables the doctor to make a preliminary clinical diagnosis which can be confirmed by specific laboratory diagnosis [25].

Currently, dermatologists along with other doctors are at the forefront of diagnosis of HIV infection and AIDS. This is because skin lesions and mucous membranes are most often affected by HIV infections [4].

Mucocutaneous findings occur throughout the course of HIV infection. The spectrum of skin lesions and mucous membranes in HIV infection is quite wide. They can be divided into three main groups: neoplastic, infectious (i.e viral, bacterial and fungal) and other dermatoses with unclear pathogenesis [4, 12].

Some of the infectious dermatoses (such as mucocutaneous candidiasis, molluscum contagiosum, herpes zoster, persistent herpes simplex infection, tinea infections and Kaposi sarcoma) and some inflammatory disorders (including eosinophilic folliculitis, papular pruritic eruption and seborrhoeic dermatitis) show an inverse relation with CD4 cell count. These dermatoses can be used as a proxy indicator of advanced immunosuppression to start ART in the absence of facilities to carry out CD4 cell counts [4].

HIV infection is associated with an increased risk for many common as well as uncommon skin and oral diseases. In addition with HIV infection, some of these conditions (e.g. molluscum contagiosum, scabies, tinea infections and oropharyngeal candidiasis) tend to be more severe, have atypical presentations, have poor response to therapy and relapse more frequently (requiring multiple courses of therapy) than in the uninfected population[11].

Scabies is a parasitic infection of the skin that is caused by the mite; Sarcoptes scabiei var. hominis. It occurs throughout the world with an estimated 150 million cases [14] but is a widespread problem in areas of poor sanitation, overcrowding and social disruption. The prevalence of scabies in children is estimated to be 0.2% to 24% globally, and 1.3% to 17% in sub-Saharan Africa [24].

In HIV-infected populations, prevalence has been reported as between 0.5% to 6% in adults and 2% to 10% in children [19].

Scabies has been described as an endemic and an epidemic. In industrialized countries, it occurs as an epidemic in institutional settings, such as in nursing homes and prisons. Scabies transmission occurs by direct skin-to-skin contact with an infected person; the higher the parasitic burden, the greater the likelihood of transmission. Transmission via fomites, such as shared clothing, is rare but may be seen in immunocompromised individuals [5, 7, 13].

Scabies infection is characterized by intensely pruritic and erythematous papules and papulovesicles. The classical sites of infestation are in the interdigital web spaces of the fingers, the wrists, axillary areas, female breasts (particularly the skin of the nipples), peri-umbilical area, the penis, scrotum and buttocks [6]. The average number of mites reported per patient is approximately 5 to 15. The female mite burrows downwards into the skin, consuming the horny layer of the epidermis and the sera that seeps into the burrow from the dermis. The burrows are often undetectable, but can be seen as greyish, short, wavy lines in affected areas. Atypical presentations are common in immunosuppressed patients, such as the HIV-infected, or in those with chronic infection. Nodules can occur in some cases, and can take several months to disappear after successful treatment [23]. Papules can develop into secondary lesions with infection, crusting and excoriations. Secondary infection with Staphyocccus and Streptococcus can occur, causing complications including impetigo, abscess, cellulitis and septicaemia, as well as immunologic diseases including glomerulonephritis.

Scabies in HIV- infected people: A broad spectrum of presentations of scabies occurs in the HIV-infected population. Scabies may present as atypical or crusted forms [20]. Crusted scabies is a severe, debilitating disease. It is an uncommon condition, most often presenting in immunocompromised individuals, such as those with HIV infection, especially in association with a low CD4 cell count [8], as well as the elderly. The infection is characterized by considerably high numbers of mites where multiplication continues unhindered, producing thousands to millions of mites. The clinical picture shows hyperkeratotic skin crusts that may be loose, scaly and flaky, or may have thick and adherent presentation. The crust contains high numbers of mites. The distribution may be localized or extensive and often in atypical patterns including the neck, face, scalp, eyelids and under the nails [6, 7].

Diagnosis of scabies is usually made on clinical findings. Confirmatory tests include microscopic identification of the mites, eggs or mite faeces. Secondary bacterial infection of the skin lesions may also occur.

Treatment. Scabies, especially crusted scabies, is associated with considerable patient distress due to itching and potential stigma, as well as being an entry point for secondary bacterial infection of the skin, which is a significant risk for morbidity and even mortality. Therefore, prompt resolution of the skin manifestations is a priority to patients and their families.

Permethrin appears to be the most effective treatment for scabies infection. It has been tested against topical crotamiton and oral ivermectin in RCTs and it appears to be superior in terms of minimizing treatment failure in participants with a clinical diagnosis of scabies. A few trials show no difference in cure rates between permethrin and topical benzyl benzoate. However, no serious adverse effects leading to death or permanent disability were reported.

Ivermectin is currently the only oral treatment for scabies that is in routine use. It appears to be more effective than both placebo and lindane but is less effective than permethrin.

The limited data on crusted scabies in HIV-infected patients suggest a good effect of oral ivermectin. Local ivermectin resistance needs to be assessed and considered.

Treatments should be based on severity with separate recommendations for the severe form of scabies with a very high mite burden including crusted scabies and for the classic mild/moderate type.

For mild/moderate disease in association with HIV infection, treatment efficacy appears to be similar to individuals in the HIV-negative population. A Cochrane review [21] included 22 studies involving 2,676 people without HIV (both children and adults)where one study was a controlled trial with a placebo, six studies including children, three studies including adults, and 13 studies including both children and adults. In HIV-negative study subjects with non-crusted scabies, topical permethrin appeared to be more effective than oral ivermectin (three trials). Permethrin appeared to be the most effective topical treatment for scabies and ivermectin appeared to be an effective oral treatment.

Currently there is no data on the best treatment for scabies in association with HIV. There is also no evidence that treatment of HIV-associated crusted scabies is different from treatment of non HIV-associated crusted scabies. The use of oral ivermectin (200 μg/kg in two doses, one to two weeks apart) was found to be successful in several reviews [15-16, 18, 22]. Keratolytics were shown to be useful in reducing the mite burden of scabies in all cases.

According to Guidelines on the treatment of skin and oral HIV-associated conditions in children and adults (WHO, 2014) [11]:

* For scabies in HIV-infected children and adults (including pregnant women) topical application of permethrin 5% (two applications) is recommended. If permethrin is not available, benzyl benzoate (at least two applications) should be used. If there is poor response to treatment, or permethrin treatment is not feasible, then oral ivermectin at 200 µg/kg is recommended.
* For severe or crusted scabies in HIV-infected children ≥15 kg and adults:
* Two doses (with one to two weeks in-between) of oral ivermectin;
* If ivermectin is not available, then treat with topical permethrin 5% (or alternatively benzyl benzoate) until clinically clear, as longer treatments may be required.
* For severe or crusted scabies in HIV-infected children <15 kg:
* Topical permethrin 5% (or alternatively benzyl benzoate) until clinically clear, as longer treatments may be required.
* In addition, a keratolytic, such as 5% salicylic acid, may be used to remove scale bulk.

Patients should be advised that the itch and rash may persist up to two weeks even after successful treatment.

In addition to individual patient management, contact tracing and treatment are necessary to prevent spread of disease and ensure treatment success. All family members and people in close contact should be treated simultaneously. In close-contact communities such as nursing homes, hospitals, schools and prisons, all patients and staff are required to have treatment. In addition household items such as clothes, towels and bedding should be washed in hot water, dried and ironed [21]. Alternatively, the clothes can be placed in sealed bags for a week, by which time the mites will have died.

The use of ART in HIV-infected patients with reconstitution of the immune system will probably reduce the frequency of crusted scabies.

**Conclusion**: Dermatologocal problems occur in > 90 % patients with HIV infection. Given the relative ease of examination of skin and because most skin diseases are amenable to diagnosis by inspection and biopsy, evaluation of skin remains an important tool in the diagnosis of HIV infection.

With HIV infection, some of skin infection (e.g. molluscum contagiosum, scabies, tinea infections and oropharyngeal candidiasis) tend to be more severe, have atypical presentations, have poor response to therapy and relapse more frequently (requiring multiple courses of therapy) than in the uninfected population [11].

Early and proper diagnosis of skin diseases in HIV-infected individuals allows for monitoring and improving the quality of life. On the other hand, because dermatological manifestations may be the first sign of HIV infection (and a surrogate marker of the severity of disease), therefore offering HIV testing to affected individuals can lead to early diagnosis and early treatment with ART, and in turn, to decrease of disease progression and reduction of onward HIV transmission [24].

**ШИРОКИЙ СПЕКТР КЛИНИЧЕСКИХ ПРОЯВЛЕНИЙ ЧЕСОТКИ В ВИЧ-ИНФИЦИРОВАННОЙ ПОПУЛЯЦИИ**

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**Резюме**. Одним из методов борьбы с распространением ВИЧ-инфекции является своевременное выявление и лечение лиц с ВИЧ / СПИДом, особенно на ранних стадиях заболевания. Статья посвящена описанию особенностей клинических проявлений, диагностики и лечения чесотки у ВИЧ-инфицированных.

**Ключевые слова**: ВИЧ-инфекция, чесотка, клинические признаки, диагностика, лечение, особенности.

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