

EPIDEMIOLOGICAL FEATURES OF SCABIES AND IMPROVEMENT OF ITS DIAGNOSTICS

Mamatkhuzhaev Azamatjon Saidakbarovich

Department of Infectious Diseases

Andijan State Medical Institute

Uzbekistan, Andijan

Eshboev Egamberdi Xusanovich

Republican specialised scientific and practical medical

center of dermatovenerology and cosmetology

Uzbekistan, Tashkent

ABSTRACT: This article discusses the epidemiological features of scabies and modern approaches to its diagnostics. Scabies remains a common parasitic disease in many regions of the world, and its epidemiology is highly dependent on socio-economic conditions, population density and the general level of medical literacy. Particular attention is paid to improving diagnostic methods: from classical methods (scraping microscopy) to modern technologies (dermatoscopy, confocal microscopy). Recommendations for improving screening and detection of the disease at early stages are presented.

Key words: scabies, *Sarcoptes scabiei*, epidemiology, dermatoscopy, diagnostics, microscopy, prevention, infectious diseases.

ЭПИДЕМИОЛОГИЧЕСКИЕ ОСОБЕННОСТИ ЧЕСОТКИ И СОВЕРШЕНСТВОВАНИЕ ЕЕ ДИАГНОСТИКИ

Маматхужаев Азаматжон Саидакбарович

Кафедра инфекционных болезней

Андижанского государственного медицинского института

Узбекистан, Андижан

Эшбоев Эгамберди Хусанович

Республиканский специализированный научно-практический медицинский центр

дерматовенерологии и косметологии

Узбекистан, Ташкент

РЕЗЮМЕ: В данной статье рассматриваются эпидемиологические особенности чесотки и современные подходы к её диагностике. Чесотка остаётся распространённым паразитарным заболеванием во многих регионах мира, причём её эпидемиология сильно зависит от социально-экономических условий, скученности населения и общего уровня медицинской грамотности. Особое внимание уделяется совершенствованию методов диагностики: от классических методов (микроскопия соскоба) до современных

технологий (дерматоскопия, конфокальная микроскопия). Представлены рекомендации по улучшению скрининга и выявления заболевания на ранних стадиях.

Ключевые слова: чесотка, *Sarcoptes scabiei*, эпидемиология, дерматоскопия, диагностика, микроскопия, профилактика, инфекционные заболевания.

INTRODUCTION

Scabies is a common parasitic skin disease caused by the scabies mite *Sarcoptes scabiei* var. *hominis* [1]. Characteristic signs include severe itching, especially at night, as well as rashes and characteristic mite "passages" on the skin. The disease is registered in all age groups, but is most widespread in crowded living conditions (dormitories, boarding schools, nursing homes), with a low level of hygiene and insufficient access to medical care [2].

The purpose of this article is to analyze current data on the epidemiological characteristics of scabies and highlight the prospects for improving its diagnostics, which can contribute to a more effective fight against this disease.

Epidemiological features

Prevalence - According to the World Health Organization, millions of cases of scabies are registered annually, and the true figures may be higher than the official ones [1].

Regional differences: The highest incidence rates are observed in developing countries in Africa, Asia and Latin America, where living conditions promote the rapid spread of the mite.

Seasonality: In some regions, there is a seasonal increase in the incidence of scabies, associated with climatic conditions (high humidity, crowded indoor spaces). However, there is no generally accepted pronounced seasonality in many countries [4].

Risk factors - Socioeconomic conditions: low income and insufficient health literacy make it difficult to detect and treat scabies in a timely manner. Overcrowded living conditions: places where people stay together (kindergartens, schools, barracks, prisons) create optimal conditions for the transmission of the scabies mite. Weakened immune system: people with immunodeficiencies may develop Norwegian (crusted) scabies, which is characterized by a more severe course. Untimely treatment: without timely therapy, the sick person continues to be a source of invasion, infecting others.

Transmission routes - The main route of transmission of scabies is direct skin-to-skin contact. Infection can also occur through household items (towels, bed linen), but this route is less significant than direct physical contact. Risk groups include members of the same family, sexual partners, and people living in the same room [5].

Modern aspects of diagnostics

Classical methods - Microscopic examination of scrapings. The essence of the method: taking a scraping from the lesion (most often from the mite "passage") and examining it under a microscope for the presence of an adult mite, eggs, or excrement. Disadvantages: Accuracy largely depends on the experience of the doctor and the correct location for collecting the material. False negative results may occur with a small number of mites (especially at an early stage or if the patient is very clean).

Fine-needle express diagnostics. - The essence of the method: opening the scabies passage with a needle and removing the mite for microscopy. Advantages: sometimes provides higher sensitivity compared to a regular scraping, but also requires careful technique.

Modern methods - Dermatoscopy. Used to visualize scabies passages, mites and other structures on the skin. Allows you to quickly determine the location for targeted scraping or needle biopsy. Advantage: non-invasive technique with fairly high sensitivity [3].

Confocal laser scanning microscopy. Allows you to obtain highly detailed images of the superficial layers of the skin in real time. Advantage: does not require invasive material collection and can detect mites in the early stages. Disadvantages: high cost of equipment and the need for special training of personnel.

Fluorescent methods - Use of special dyes to detect the mite and its "waste products" under a fluorescent microscope. Limited use in routine practice due to the complexity and high cost of reagents.

Clinical diagnostics - In addition to instrumental methods, clinical assessment of complaints and examination of the skin are important. Characteristic signs: intense itching, worse at night; typical localization of rashes (interdigital spaces, wrists, flexor surfaces of the forearms, groin areas, in children - soles, palms); presence of "scabies passages"; involvement of several family members or a group [5]. However, the clinical picture may be blurred in individuals with good hygiene or in the early stages of the disease (Heukelbach & Feldmeier, 2006).

Ways to improve diagnostics - Widespread introduction of dermatoscopy. Training health workers in dermatoscopy skills can improve the accuracy and speed of diagnosis, especially in primary health care. Combination of classical and new methods. The combination of dermatoscopy and scraping microscopy provides higher sensitivity than each method alone. Development of rapid tests. In the future, it is possible to develop simple and inexpensive rapid tests that can quickly detect mite fragments or specific proteins (antigens). Telemedicine and artificial intelligence [6]. With the development of digital technologies, it is possible to create algorithms based on neural networks that can automatically recognize scabies from photographs of rashes taken using a smartphone or a digital dermatoscope [7].

DISCUSSION

Given the high contagiousness of scabies, early diagnosis is of paramount importance in the fight against the disease. The optimal approach involves a comprehensive assessment: a thorough anamnesis (the presence of itching in family members), a clinical examination using a dermatoscope and confirmation of the diagnosis by a laboratory method.

In socially disadvantaged regions, where access to modern methods is limited, classical diagnostic methods (scraping microscopy) remain important. At the same time, the introduction of dermatoscopy and telemedicine solutions can significantly simplify the process of identifying scabies and rationalize the appointment of treatment, which is especially important in closed groups.

Preventive and organizational aspects - Timely detection and treatment: reducing the risk of spread is achieved through active detection (screening) in children's institutions, hostels, boarding schools, etc.

Hygiene and education: informing the population about the need to maintain personal and household hygiene, regularly change linen, reduce close contacts when signs of the disease appear.

Quarantine measures: in case of scabies outbreaks in organized groups, it may be necessary to isolate infected individuals and treat all contacts simultaneously.

Personnel training: it is important to improve the qualifications of general practitioners, dermatologists and nurses, teaching them modern methods of scabies diagnosis and treatment.

CONCLUSION

Scabies remains a pressing public health problem in many countries, especially in areas with low socio-economic development and high population density. The epidemiological features of the disease are determined by factors such as social infrastructure, hygienic conditions and the quality of health care.

Modern diagnostic methods, including dermatoscopy and confocal microscopy, can significantly improve the accuracy of scabies detection, but require financial costs and specialist training. At the same time, classical methods (scraping, needle technique) remain accessible and in demand, especially in resource-limited settings.

Further improvement of diagnostics is possible through the introduction of digital technologies, telemedicine and the development of rapid tests. An integrated approach that includes preventive and organizational measures will effectively combat the spread of scabies and reduce its incidence globally.

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