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OPPORTUNISTIC INFECTIONS IN PATIENTS WITH DIABETES MELLITUS

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✓ **Resume**

Diabetes mellitus (DM) is a chronic disease accompanied by impaired carbohydrate metabolism, which has a systemic impact on the immune system. This study aims to investigate the spectrum of opportunistic infections in 12 patients with type 2 diabetes mellitus aged 35-50 years. The assessment was conducted based on the analysis of medical records, clinical examination, and the results of laboratory tests. The results showed a high frequency of respiratory and urogenital infections in this group of patients. The data obtained indicate the need for a comprehensive approach to the management of patients with type 2 diabetes mellitus, including the prevention and timely diagnosis of infectious diseases.

Keywords: Diabetes mellitus, opportunistic infections, immunity, bacterial infections, clinical study.

Introduction

Type 2 Diabetes Mellitus (T2DM) is one of the most prevalent chronic diseases. It causes metabolic disorders and negatively impacts the immune system, creating prerequisites for the development of infectious complications. Patients with T2DM have an increased risk of bacterial and fungal infections in various locations. Hyperglycemia impairs phagocytosis, chemotaxis, and reduces the antimicrobial activity of neutrophils, which contributes to increased susceptibility to pathogenic microorganisms. Patients with T2DM are more susceptible to infections and tend to experience more severe infections, requiring longer treatment and leading to higher mortality rates. The increased susceptibility to infections in T2DM is due to a number of factors, including impaired immune function, micro- and macroangiopathy, neuropathy, and impaired phagocyte function. Hyperglycemia, in particular, has a negative effect on immune cells, reducing their ability to chemotaxis, phagocytosis, and cytokine production.

The aim of this work is to assess the structure and frequency of infectious complications in patients with T2DM aged 35–50 years, and to identify the relationship between glycemia levels and susceptibility to infections. This age range is important because many patients are diagnosed with T2DM for the first time at this age, and it is particularly important during this period to identify and control risk factors associated with infections.

Materials and methods

The study included 12 patients with a confirmed diagnosis of T2DM, aged 35 to 50 years. The average duration of the disease was 9.1 years. Patients underwent a comprehensive clinical and laboratory examination, including:

- general and biochemical blood tests,
- determination of glucose and glycated hemoglobin (HbA1c) levels,
- bacteriological studies,
- instrumental diagnostics as needed.

Results

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Infectious complications were identified in 10 out of 12 patients (83%). Urinary tract infections were the most common, occurring in 6 patients, with Escherichia coli being the etiological agent in all cases. Skin bacterial infections, including furunculosis, were observed in 3 patients. One patient had pneumonia. Two patients were diagnosed with chronic fungal infections of the skin and nails.

In 9 out of 12 patients, the HbA1c level exceeded 8.5%, indicating inadequate glycemic control. An elevated C-reactive protein level, indicative of an inflammatory process, was found in 8 patients. In patients with a diabetes duration of more than 10 years, infections were recurrent.

Two patients showed no signs of infectious complications. Their HbA1c level did not exceed 7.8%, and their duration of diabetes did not exceed 6 years.

Table 1. Clinical characteristics of patients

№	Age	Gend.	W/exp. (years)	HbA1c (%)	Type of infection	Localization	CRP↑	Repeated infections
1	49	W	14	9.2	Bacterial	Genitourinary	Yes	Yes
2	44	M	11	8.8	Cutaneous (furunculosis)	Skin	Yes	Yes
3	41	W	6	7.4	Absent	—	No	No
4	35	M	5	8.1	Bacterial	Genitourinary	Yes	No
5	50	W	13	9.8	Пневмония	Easy	Yes	Yes
6	38	M	7	8.6	Fungal	Nails	No	No
7	42	W	10	9.1	Skin	Skin	Yes	Yes
8	36	W	3	7.8	Genitourinary	Genitourinary	No	No
9	47	M	15	10.2	Bacterial	Skin, genitourinary	Yes	Yes
10	39	W	9	8.3	Fungal	Skin	No	No
11	45	M	8	8.9	Genitourinary	Genitourinary	Yes	No
12	40	W	6	7.7	Absent	—	No	No

Discussion

The data from the present observation demonstrate a high frequency of infectious complications among middle-aged patients with T2DM. Over 80% of the examined individuals suffered from infections of various localizations, with urogenital infections and skin bacterial lesions being the most common. This confirms the findings of previous studies indicating the vulnerability of these organs in the context of impaired glucose metabolism.

A pronounced correlation was found between the level of glycated hemoglobin (HbA1c) and the frequency of infections. The majority of patients with HbA1c >8.5% experienced recurrent infections, which confirms the negative impact of chronic hyperglycemia on immune resistance. Moreover, patients with a diabetes duration of >10 years more often had multifocal or recurrent infections.

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The elevated C-reactive protein level in 66.7% of patients indicates the presence of a systemic inflammatory process. This can serve as an additional criterion for the early detection of latent or chronic foci of infection in patients with diabetes mellitus.

It is also noteworthy that fungal infections of the skin and nails were less common but, as a rule, had a chronic course.

Thus, clinicians should consider the high risk of infection in T2DM, especially with poor glycemic control. Active prevention, timely detection and treatment of infections, as well as regular monitoring of inflammatory markers, are necessary.

Conclusion

Patients with type 2 diabetes mellitus are at high risk of developing comorbid infections, predominantly of bacterial origin. Elevated HbA1c levels and the duration of the disease are the main risk factors. A comprehensive approach to treatment, including adequate glycemic control and early diagnosis of infections, can reduce the frequency of complications and improve the quality of life for patients.

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