PREDICTING THE COURSE OF DIABETIC FOOT SYNDROME

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Annotation. The authors of the article present the results of observation of 352 patients with purulent-necrotic complications in the lower extremities on the background of diabetes mellitus. Clinical (podiatric examination of the foot, collection of clinical signs and anamnesis), laboratory (biochemical, microbiological, immunological and morphological) and instrumental (ultrasonic echoosteometry, chemical examination of bone composition, ultrasound Doppler, radiography) studies were carried out. Based on the study of 8 parameters that most strongly affect the course and outcome of treatment, a scoring scale for assessing the severity of diabetic foot syndrome was developed. As a result of the analysis of the values of the total score, 3 degrees of severity of the diabetic foot syndrome (mild, moderate and severe) were identified.

Key words: diabetes mellitus, diabetic foot syndrome, course.

Relevance. Recently, works have appeared in the literature that present the results of analyzes of the main reasons for the low efficiency of care for patients with purulent-necrotic complications of the lower extremities on the background of diabetes mellitus (1,2,6). The main treatment and diagnostic errors are the lack of a differentiated approach according to clinical forms and an incorrect assessment of the severity of the diabetic foot syndrome without taking into account physical, laboratory and instrumental data (3,4,5,7).
The purpose of the study: to study and predict the course of purulent-necrotic processes in the lower extremities against the background of diabetes mellitus, taking into account clinical, laboratory and instrumental studies.
Material and research methods. We examined 352 patients with purulent-necrotic complications in the lower extremities on the background of diabetes mellitus. Clinical (podiatric examination of the foot, collection of clinical signs and anamnesis), laboratory (biochemical, microbiological, immunological and morphological) and instrumental (ultrasonic echoosteometry, chemical examination of bone composition, ultrasound Doppler, radiography) studies were carried out.
The course of purulent-necrotic complications of the lower extremities against the background of diabetes mellitus was characterized by the stages and clinical forms of the diabetic foot syndrome.

Rice. 1. View of the patient's foot at stage 0 according to Wagner.

Rice. 2. View of the patient's foot at stages I-II according to Wagner.
There is an infected trophic ulcer on the plantar surface of the foot.

Rice. 3. View of the foot at stage III according to Wagner. Phlegmon of the dorsum of the foot.

Figure 4. View of the foot at stage IV according to Wagner. Gangrene of the first toe of the right foot.

Rice. 5. View of the foot at stage V according to Wagner. Progressive gangrene of the foot.

We consider the establishment of the clinical forms of the diabetic foot syndrome (neuropathy, ischemia and osteoarthropathy) and the depth and spread of the purulent-necrotic process with the interpretation of the results of laboratory and instrumental studies to be an obligatory condition for the choice of treatment tactics. This situation served as a prerequisite for the creation of a working scale for an objective assessment of the severity of the condition of patients with purulent-necrotic complications of the lower extremities in diabetes mellitus. At the same time, we took into account 8 parameters that most strongly affect the course and outcome of DFS treatment. When creating this scale, we relied on the results of our own studies, the identified features of the course of the diabetic foot syndrome. Based on the studies and anamnestic data, 3 gradations were identified, which were assessed by the corresponding points (I - 1, II - 2 and III - 4 points) (Table 1). clinical forms of diabetic foot syndrome.

Table 1.

Diabetic Foot Syndrome Severity Scale

№	Indicators	Scale of points		
		I	II	III
1	Severity of clinical forms	Severity of clinical forms Neuropathy, no ischemia and osteoarthropathyi	Non-critical ischemia, non-destructive osteoarthropathy	Critical ischemia, destructive osteoarthropathy
2	The state of purulent-necrotic process according to Wagner	stage I-II (superficial and deep trophic ulcer)	stage III (phlegmon and osteomyelitis of the foot)	stage IV-V (progressive gangrene of fingers and feet)
3	Degree of diabetes compensation	Compensation (up to 7 mmol/l)	Sub-compensation (7.1-7.5 mmol/l)	Decompensation (more than 7.5 mmol/l)
4	4 Duration of diabetes	Up to 5 years	5-10 years	More than 10 years
5	Microbial contamination*	No microbial growth	Microbial growth below critical numbers (1.2x103 in 1 gram of tissue)	Microbial growth above critical numbers (2.1x104-5 in 1 gram of tissue)*
6	Immunological studies*	Within normal limits	Unsignificant decrease in cellular and humoral immunity	Significant decrease in cellular and humoral immunity *
7	Morphological studies*	Absence of necrotic masses	Elements of inflammation	Elements of inflammation with necrotic masses

			without necrotic masses	
8	Concomitant pathologies	No comorbidity	1 pathology	2 or more

Note: * - changes in indicators of one of these studies.

Results. As a result of the analysis of the values of the total score, 3 degrees of severity of the diabetic foot syndrome were identified (Table 2).

Table 2.

The severity of purulent-necrotic complications of the lower extremities in patients with diabetes mellitus before treatment.

Groups	I degree, mild II degree	II degree	III degree, severe	Total
I group	35 (31,3%)	38 (33,9%)	39 (34,8%)	112 (100%)
II group	20 (24%)	36 (43,4%)	27 (32,5%)	83 (100%)
III group	30 (31,6%)	34 (35,8%)	31 (32,6)	95 (100%)
IV group	12(19,4%)	24(38,7%)	26 (41,9%)	62 (100%)

I degree, mild - from 8 to 10 points. A purulent-necrotic process proceeded with a tendency to delimit the infectious process, the prognosis was considered favorable. Mostly minor surgical interventions (necrectomy) were performed.

II degree, moderate - from 11 to 16 points. These patients underwent emergency surgical interventions only according to strict indications (opened purulent foci, drainage, removal of destructive areas). Basically, the operations were performed after a thorough preoperative preparation, which was aimed at correcting the identified changes. All performed operations were organ-preserving in nature (small amputations of fingers and feet).

III degree, severe - more than 17 points. The prognosis in this category of patients was considered unfavorable. Given these features, operations in this group were performed after a decrease in the severity. Mostly in this group of patients, high limb amputations were performed for health reasons.

Discussion. Thus, our results are important in the course and choice of treatment for diabetic foot syndrome. In the management of patients with purulent-necrotic complications in the lower extremities against the background of diabetes mellitus, for a correct assessment of the severity of the diabetic foot syndrome, a prerequisite is to determine the clinical form (neuropathy, ischemia, osteoarthropathy or mixed forms), the depth and spread of the destructive process. Accounting and interpretation of the results of clinical, laboratory and instrumental studies plays an important role in the choice of treatment tactics for diabetic foot syndrome. Timely surgical treatment, taking into account the severity of the course of the diabetic foot syndrome, makes it possible to stop the destructive process in the lower extremities.

Conclusions. During the management and choice of treatment tactics for patients with purulent-necrotic complications in the lower extremities against the background of diabetes mellitus, we consider it necessary to solve the following tasks:

- to determine the clinical form of the diabetic foot syndrome;
-determine the depth of the lesion and the prevalence of the purulent-necrotic process, i.e. stage of diabetic foot syndrome;
-assess the condition of bone structures;
-identify pathogenic microflora and determine its sensitivity to antibiotics;
- evaluate the protective properties of the body for the timely correction of immune mechanisms;
-determine the degree of compensation for the underlying pathology;
-conducting and interpreting laboratory, instrumental studies.

Literature index.

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