Improvement Of Treatment Protocols Of Pain Syndrome In Patients With Chronic Brucellosis

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Abstract

Despite the fact that brucellosis is a particularly dangerous, socially significant endemic infectious disease, to date, there are very few published scientific research on complex treatment, taking into account the pathogenetics of the disease.

Materials and methods. The data of 52 patients, with a diagnosis of chronic brucellosis accompanied by pain syndrome, were analyzed. Based on the received treatment, all patients were divided into 3 groups. The dynamics of treatment was evaluated by laboratory tests, and the perception of pain was evaluated by a 10-point visual analogue scale.

Results. The analysis showed that in all groups there was a positive trend, but the trend of the dynamics was different. The highest rate of improvement in the general condition of patients and reduction of pain was observed in the third group (p-trend<0.0001), which received B vitamins, along with antibiotic therapy and non-steroidal anti-inflammatory drugs (NSAIDs). A lower rate of improvement was observed in the group of patients receiving antibiotic therapy and NSAIDs.

Conclusions. Treatment of chronic brucellosis should be rational and comprehensive, taking into account neurological symptoms, the course, the nature and severity of the pain syndrome. It is advisable to prescribe vitamins of group B, along with NSAIDs and antibiotics, to provide a more rapid improvement in the general condition of the patient.

Keywords: chronic brucellosis, neurobrucellosis, pain syndrome, treatment

1. INTRODUCTION

Brucellosis is a particularly dangerous and socially significant infectious disease that causes significant economic damage and a high level of disability among patients. A steady increase in the incidence of brucellosis is a global problem [1,2]. According to the WHO, there are more than five million patients with brucellosis in the world and their number is

increasing annually by 500,000 [3]. One of the regions where this disease is widespread is Central Asia [4].

Clinical signs of brucellosis are often acute and nonspecific, which complicates the diagnosis of the disease in the early stages [5]. It affects almost all body systems [6, 7]. The most common symptoms of brucellosis are fever, general fatigue, sweating, and myalgia [8]. Disorders from the nervous system are most common in chronic brucellosis, and lesions of both the central nervous system are revealed, the clinic of which fits into the syndromes of arachnoiditis, meningoencephalitis, myelitis, and the peripheral department in the form of polyneuropathies, radiculopathies, plexitis, neuritis [9].

At the present stage, there are many approaches and directions for the treatment of patients with acute and chronic brucellosis [10,11,12], but the most attention is paid to the issues of rehabilitation treatment, which is the most promising directions in the treatment of patients with peripheral nervous system damage in chronic brucellosis.

The development of medicine was reflected in the features of damage to the nervous system during brucellosis: damage to the peripheral nervous system became softer, and impairment of the central nervous system became rarer or not observed at all. So, in chronic brucellosis, neurological syndromes often occur with a variety of diffuse symptoms, complex types of disorders of sensitivity and motor sphere, the most common symptoms of a functional nature in the form of neuralgia [13].

The purpose of the study: to analyze the main characteristics and some methods of treatment of pain with damage to the nervous system in patients with brucellosis, in order to improve existing protocols of the chronic brucellosis treatment.

2. MATERIALS AND METHODS

Data from 52 patients with a confirmed diagnosis of chronic brucellosis who were treated in the neurological department from January 2015 to December 2019 was used in the study. Patients with complaints of pain syndrome were included to the study. The diagnosis of chronic brucellosis was confirmed by clinical and epidemiological examination with specific laboratory diagnostics (enzyme-linked immunosorbent assay with the determination of antibodies to the pathogens of brucellosis Br. Abortus, Br. Melitensis) [14]. Additional diagnostic methods included clinical and biochemical studies and radiography of the joints and spine.

Based on the received treatment, all patients were divided into 3 groups:

Group 1 (17 patients): those who received traditional treatment (two or three antibiotics from the tetracycline, streptomycin, doxycycline and rifampicin series in combination with a sulfonamide antibiotic) [15,16,17];

Group 2 (17 patients): those who received traditional treatment + non-steroidal anti-inflammatory drugs;

Group 3 (18 patients): those who received traditional treatment + non-steroidal anti-inflammatory drugs + a complex vitamins of B group (composition: thiamine hydrochloride 100 mg, pyridoxine hydrochloride 100 mg, cyanocobalamin 1 mg and excipients);

Patients were randomly assigned to treatment groups, but since the age, sex and severity of the patient's condition are strong parameters that can have a significant impact on

the study outcome, control barriers were used in the sample so that all groups were similar in these characteristics.

The dynamics of treatment was assessed by laboratory studies, and pain perception was assessed using a 10-point visual analogue scale (VAS) before, at 2-, 4- and 8-weeks (after the end) of treatment [18, 19].

Microsoft Excel (Microsoft Office Professional Plus 2019) was used for statistical processing. Mainly, one-way analysis of variance and Student's t-test were used to compare the mean values of variables from different groups.

3. RESULTS AND THEIR DISCUSSION

There were 52 patients under observation, with complaints of pain syndrome, of which women - 44 (85%), men - 8 (15%). The age of the patients varied from 39 to 84 years, the average age was 53.7 years, 38.5% of all patients belonged to the age group from 50 to 60 years (Table 1).

Table 1. Age composition of patients

#	Age groups	Frequency
1	from 24 to 30	6 (11,5%)
2	from 30 to 40	10 (19,2%)
3	from 40 to 50	8 (15,4%)
4	from 50 to 60	20 (38,5%)
5	60 and older	8 (15,4%)

The occupational nature of the disease with a contact route of infection was established among 32 (61.5%) patients by the preliminary epidemiological anamnesis collection: 20 (38.5%) patients turned out to be meat-packing plant workers, who did not receive specific prophylaxis regularly; 4 (7.7%) patients were veterinarians; 6 (11.5%) patients were milkmaids; 2 (3.8%) patients presumably with a mixed (aerogenic and alimentary) route of infection. The remaining 20 (38.5%) patients were infected by the alimentary route by eating unboiled milk and raw dairy products: feta cheese, cream, sour cream, etc.

All patients were divided into 3 treatment groups. The distribution did not take into account the routes of infection, but control was carried out so that the groups turned out with similar demographic and clinical indicators, so that the results were not biased due to the prevalence of any indicator in one group (Table 2).

Table 2. General demographic and clinical characteristics of the treatment groups

	1st group	2nd group	3rd group
General characteristics			
Number of parients	16	18	18
Mean age (STD)	46 (231,5)	49,4 (195,8)	49,1 (174,2)
Gender (female, %)	14 (87,5%)	15 (83,3%)	15 (83,3%)
Clinical indicators *frequency of patients with:*			
fever	82%	84%	82%
severe pain syndrome	100%	100%	100%
damage to the musculoskeletal system	4 (25%)	5 (27,8%)	4 (22,2%)
severity of neurological pain syndrome	6,6	6,8	6,4

(mean VAS, min-max values)	5,1-8,2	5,2-8,4	5,2-8,2
	p=0,3753		

As a result of the treatment of patients in all three study groups, a positive trend was observed in the form of a decrease in pain syndrome or its complete relief, an improvement in the neurological status, as well as their mental and physiological state.

The patients' condition was assessed at 2-, 4- and 8-weeks of treatment. In all groups there was an improvement in the general condition, but rather good results were noted in the 3rd group (table 3). The dynamic VAS scores were statistically significantly better than the scores of groups 1 and 2 when analyzing the VAS score within each group in terms of assessment time, as well as between groups, taking into account the assessment time.

Table 3. Dynamics of VAS indicators at 2-, 4- and 8-weeks of treatment (min-max).

	Initial state	2-week	4-week	8-week	Between group p-value
1-group	6,6 (5,1-8,2)	6,2 (4,8-8,0)	6,1 (4,8-8,0)	5,1 (4,4-5,6)	p<0,0001
2-group	6,8 (5,2-8,4)	6,4 (4,8-8,0)	4,9 (4,3-5,5)	4,1 (3,5-4,7)	p<0,0001
3-group	6,4 (5,2-8,2)	4,7 (4,3-5,4)	3,4 (2,4-4,0)	2,8 (2,2-3,3)	p<0,0001
Within group p-value	p=0,3753	p<0,0001	p<0,0001	p<0,0001	

The first group, which received traditional treatment, showed a slow recovery over 8 weeks and the average VAS decreased by 1.5 points. In patients of the second group, a decrease of 2.7 points was noted over the same period of time. In the third group, the VAS indicator decreased by 3.6 points. In all groups, the downward trend was statistically significant with a standard error p<0.0001.

Published studies have very often considered the issues of etiotropic therapy of patients (6, 7, 20, 21, 22). In practice, the treatment of neurobrucellosis is a difficult issue, with the determination of the severity of damage to organs and body systems, requires a more broadly pathogenetic approach. The epidemiological history plays an important role. A special approach requires the predominance of latent or primary chronic forms with low activity of the neuro-vegetative system.

Comparative analysis of the results of tested different treatment methods showed that the treatment of neurobrucellosis with the use of antibiotics and non-steroidal anti-inflammatory drugs with a complex vitamins of group B is more effective for the speedy recovery and rehabilitation of a patient with pain syndrome than those who received anti-microbial treatment itself or anti-microbial treatment in combination with non-steroidal anti-inflammatory therapy only.

In our observations, we evaluated the results of treatment and evaluated on the basis of an enzyme-linked immunosorbent assay with the determination of antibodies to the causative agents of brucellosis Br. Abortus and Br. Melitensis, as well as clinical and biochemical studies. All laboratory parameters showed positive dynamics. Since, in many works, laboratory parameters had a fairly wide discussion, in this work we focused on the dynamics of pain syndrome.

4. CONCLUSIONS

Thus, the treatment of pain in brucellosis of the nervous system should be rational and complex. It is preferable to connect non-steroidal anti-inflammatory drugs together with B vitamins to traditional anti-bacterial treatment. Inclusion of non-steroidal anti-inflammatory drugs together with B vitamins to the treatment contributes to faster recovery with low rates of residual signs complication of the disease.

Also, it is important to take into account the intensity of the neurological symptoms, the characteristics of the disease's progress, the nature and severity of the pain syndrome.

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