Observation on the influence of ulinastatin for the cerebral protection and inflammatory reaction of patients with craniocerebral injury surgery during the perioperative period

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ABSTRACT

Objective: To observe the influence situation of ulinastatin for the cerebral protection and inflammatory reaction of patients with craniocerebral injury surgery during the perioperative period, in order to understand the application value of ulinastatin in the patients with craniocerebral injury surgery. Methods: A total of 54 patients with craniocerebral injury surgery in our hospital from July 2014 to May 2015 were selected as the study object, and 54 patients were randomly divided into two groups, 27 patients in control group were treated with conventional perioperative treatment, 27 patients in observation group were treated with ulinastatin on the conventional perioperative treatment, then the cerebral blood flow parameters, serum nerve function related indexes, pro-inflammatory cytokines and anti-inflammatory cytokines of two groups before the treatment and at 1st, 3rd and 5th day after the treatment were analyzed and compared. Results: The cerebral blood flow parameters, serum nerve function related indexes, pro-inflammatory cytokines and anti-inflammatory cytokines of two groups before the treatment were compared, while those statistical indexes of observation group at 1st, 3rd and 5th day after the treatment were all better than those of control group, the differences were all significant. Conclusion: The influence role of ulinastatin for the cerebral protection and inflammatory reaction of patients with craniocerebral injury surgery during the perioperative period is better, and its application value for the patients with craniocerebral injury surgery is relatively higher.

1. Introduction

Traumatic brain injury is a relatively serious clinical phenomena, it is one of the focus of the disease that neurological status related aspects of such patients. Inflammatory stress and disease treatment, especially for patients with surgical treatment, the need of clinical treatment improvement is relatively higher[1,2]. In recent years, clinical study about the use of ulinastatin after operation on craniocerebral injury patients are more and more common[3], but the effects is inadequate that ulinastatin on craniocerebral injury patients who undergo perioperative period, require cerebral protection and inflammatory reaction. Therefore, we carry on this research on this aspect. The result is reported at follow article.

2. Data and Methods

2.1. Clinical Data

In the period of July 2014-2016 May, Fifty-four patients who fall in traumatic brain injury are selected as the research object, this patients were randomly divided into two groups. The control group includes 27 patients that make up with 21 males, 6 females, who’s age between 18-72 years old, average age (38.0±6.7) years. The injury type is cerebral contusion and laceration in 12 patients, 10 cases of patients with epidural hematoma, 5 cases of other patients; the origin of injury: caused by traffic accident injury in 20 patients, drop caused by injuries and other reasons caused by trauma patients in 3 cases. The observation group includes 27 patients that make
up with 20 males, 7 females, who's age between 18-73 years old, average age (38.1±6.4) years, damage type: brain contusion and laceration of 13 patients with, 10 cases of patients with epidural hematoma, other 4 patients; injury causes: caused by traffic accident injury in 20 patients, drop caused by injuries and other reasons caused by trauma patients in 3 cases. There was no significant difference in the statistical data between the two groups of patients with brain surgery, P>0.05, two objects are comparable.

2.2. Method

2.2.1. Therapeutic method

There was no significant difference between the two groups in the operation mode of the same patients. On this basis, the control group was treated with conventional anti infection, dehydration, nutritional support and other symptomatic treatment. The observation group which base on the control group add the ulinastatin 10 million units to saline for intravenous infusion, respectively in intraoperative and postoperative after 7 d application. Then the two groups of patients before and after treatment, 1 d, 3 d and 5 d in the cerebral blood flow parameters, serum nerve function related indicators, inflammatory factors and anti-inflammatory factors were statistically compared.

2.2.2. Observation index and detection method

Monitoring index: cerebral blood flow parameters including carotid Qmean, Zc and DR, drawing venous blood which were centrifuged, we can get the serum, indicator for the detection of neural function related indicators, induced by inflammatory cytokines and anti-inflammatory cytokines, nerve function index of NSE and S100B and NGF, causing inflammation factors include cytokines and anti-inflammatory cytokines, nerve function index related indicators, induced by inflammatory factors and anti-inflammatory factors were statistically compared.

2.3. Statistical processing

Using the software SAS 6.0 data detection, data processing methods for the t test and $\chi^2$ test, $\alpha=0.05$.

3. Results

3.1. The comparison of cerebral blood flow parameters between two groups of patients before treatment and after treatment with 1 d and 5 d.

Before treatment, the comparison between two groups with carotid Qmean, Zc and Dr. P>0.05. After treatment 1 d, 3 d and 5 d, two groups of patients on carotid qmean, Zc and Dr continued to improve, and the observation group of Qmean and ZC and Dr were better than that of the control group, mainly for Qmean was significantly higher than that of the control group at the same time point level detection, and ZC and DRP was significantly lower than that of the control group at the same time point level detection, P<0.05, enumerate Table 1.

3.2. The comparison of serum nerve function indexes between two groups of patients before and after treatment with 1 d, 3 d and 5 d.

Before treatment, two groups patient’s index are compared, such as NSE, S100B and NGF, P>0.05, and treatment after 1 d, 3 d and 5 d, two groups of patients with NSE, S100B and NGF presented first increased and then decreased and was observed in the group of NSE and S100B and NGF were significantly below control group at the same time point level detection, P<0.05, enumerate Table 2.

3.3. The comparison of serum levels of 1 d, 3 d and 5 d in two

Table 1. The comparison of cerebral blood flow parameters between two groups of patients before treatment and after treatment with 1 d, 3 d and 5 d.

<table>
<thead>
<tr>
<th>Time</th>
<th>Control group (n=27)</th>
<th>Observation group (n=27)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Qmean (mL/s)</td>
<td>Zc</td>
</tr>
<tr>
<td>Before treatment</td>
<td>10.52±1.45</td>
<td>259.89±18.73</td>
</tr>
<tr>
<td>After treatment 1 d</td>
<td>12.57±1.65</td>
<td>242.59±17.38</td>
</tr>
<tr>
<td>After treatment 3 d</td>
<td>17.35±2.16</td>
<td>223.53±16.84</td>
</tr>
<tr>
<td>After treatment 5 d</td>
<td>21.78±2.31</td>
<td>205.71±15.28</td>
</tr>
</tbody>
</table>

Table 2. The comparison of serum nerve function indexes between two groups of patients before and after treatment with 1 d, 3 d and 5 d.

<table>
<thead>
<tr>
<th>Time</th>
<th>Control group (n=27)</th>
<th>Observation group (n=27)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NSE (µ g/L)</td>
<td>S100B (ng/mL)</td>
</tr>
<tr>
<td>Before treatment</td>
<td>16.86±1.75</td>
<td>0.48±0.06</td>
</tr>
<tr>
<td>After treatment 1 d</td>
<td>19.92±2.23</td>
<td>0.61±0.08</td>
</tr>
<tr>
<td>After treatment 3 d</td>
<td>15.24±1.60</td>
<td>0.53±0.07</td>
</tr>
<tr>
<td>After treatment 5 d</td>
<td>13.14±1.32</td>
<td>0.40±0.05</td>
</tr>
</tbody>
</table>

After treatment 1 d, 3 d and 5 d, observation group compare with the control group, P<0.05.
groups before and after treatment

Before treatment, two groups patient’s index are compared, such as IL-6, TNF-α and IL-12 comparison. *P>0.05. After treatment 1 d, 3 d and 5 d, two groups of patients with IL-6 and TNF-α, presented first increased and then decreased. IL-12 showed increased first and then decreased. The state and observation group of IL-6 and TNF-α were significantly below control group at the same time point detection level. IL-12 were significantly higher than the control group at the same time point level detection and 5 d, two groups of patients with IL-6 and TNF-α presented first increased and then decreased, IL-12 showed increased first and then decreased. The state and observation group of IL-6 and TNF-α were significantly below control group at the same time point level detection, *P<0.05. Enumerate Table 3.

3.4. Comparison of serum anti inflammatory factors between two groups of patients before and after treatment with 1 d, 3 d and 5 d

Before treatment, the index about patients all in the two groups that include IL-4, IL-10 and IL-13 are compared. *P>0.05, and treatment after 1 d, 3 d and 5 d, two groups of patients with IL-4, IL-10 and IL-13 showed first increased and then decreased and was observed in the group of IL-4, IL-10 and IL-13 were significantly below control group at the same time point level detection, *P<0.05. Enumerate Table 4.

4. Discussion

The clinical harm of cranioencebral injury is extremely bad, for cranioencebral injury related research shows, these patients not only can disturbance of consciousness, headache, nausea and vomiting[4], but also more obvious blood flow to the brain is abnormal, furthermore, the body's overall anomaly shows obvious[5,6], which inflammatory stress is very prominent. Therefore, in the treatment of such patients in the process of monitoring and improvement in many aspects, including brain protection and inflammatory reaction of the focus of the intervention. In order to achieve a better brain protection, the improvement of related indicators of cerebral blood flow and neurological function is the key aspect of[7]. Qmean, VZc and DR as a representative index of cerebral blood flow parameters, the need for improvement is higher, can effectively respond to the blood supply of the brain[8,9]. Also in nerve function index of NSE and S100B and NFG is for the neurological status, including brain states have responded positively to the value of the index, in these patients showed higher expression levels, so the were expression level of control is also very necessary[10]. Moreover, inflammatory reaction is extremely close index and body disease status relationship, which induced by inflammatory cytokines and anti-inflammatory cytokines has a balanced relationship, so the were expression modulate the clinical significance of high[11,12]. At the same time the adjustment function of the above indicators is also an important reference for the evaluation of the treatment effect of patients. Ulinastatin is a kind of drug clinical application in recent years rate is higher, the for multi class disease in patients with multiple system organ protective effects have been sure[13]. Ulinastatin on cranioencebral injury patients applied research is not uncommon, but about its role in such patients with cerebral protection and inflammatory reaction intervention study is very insufficient, so research in this aspect is extremely necessary.

In this paper we will observe and study of ulinastatin on brain injury effect of perioperative cerebral protection and inflammatory reaction of patients, mainly for the study of brain surgery patients will be applied and application of ulinastatin treatment were compared. The results show that the advantage of application of ulinastatin is more obvious, the specific performance after treatment in patients with 1D, 3D and 5D of the cerebral blood flow parameters and serum related index, nerve function of proinflammatory and anti-inflammatory cytokines and expression level is relatively better, indicating the patient's brain blood supply and nerve function improvement were better, while inflammatory state regulation effect is also good, which affirmed the application effect of ulinastatin injury patients and

Table 3.
The comparison of serum levels of 1 d, 3 d and 5 d in two groups before and after treatment.

<table>
<thead>
<tr>
<th>Time</th>
<th>Control group(n=27)</th>
<th>Observation group(n=27)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IL-6 (pg/mL)</td>
<td>TNF-α (ng/mL)</td>
</tr>
<tr>
<td>Before treatment</td>
<td>8.98±1.11</td>
<td>1.12±0.24</td>
</tr>
<tr>
<td>After treatment 1 d</td>
<td>14.56±1.35</td>
<td>1.98±0.35</td>
</tr>
<tr>
<td>After treatment 3 d</td>
<td>15.10±1.39</td>
<td>2.04±0.38</td>
</tr>
<tr>
<td>After treatment 5 d</td>
<td>10.41±1.26</td>
<td>1.48±0.30</td>
</tr>
</tbody>
</table>

After treatment 1 d, 3 d and 5 d, observation group compare with the control group, *P<0.05.

Table 4.
Comparison of serum anti inflammatory factors between two groups of patients before and after treatment with 1 d, 3 d and 5 d.

<table>
<thead>
<tr>
<th>Time</th>
<th>Control group(n=27)</th>
<th>Observation group(n=27)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IL-4 (ng/mL)</td>
<td>IL-10 (pg/mL)</td>
</tr>
<tr>
<td>Before treatment</td>
<td>0.99±0.13</td>
<td>19.97±2.35</td>
</tr>
<tr>
<td>After treatment 1 d</td>
<td>1.78±0.20</td>
<td>26.78±2.78</td>
</tr>
<tr>
<td>After treatment 3 d</td>
<td>2.14±0.24</td>
<td>31.34±3.25</td>
</tr>
<tr>
<td>After treatment 5 d</td>
<td>1.51±0.16</td>
<td>24.21±2.48</td>
</tr>
</tbody>
</table>

After treatment 1 d, 3 d and 5 d, observation group compare with the control group, *P<0.05.
clinical value of brain. In summary, we believe that the effects of ulinastatin on craniocerebral injury patients with confining effect of cerebral protection and inflammatory reaction better. For application of this kind of operation of craniocerebral injury patients is relatively high.

Reference


