The efficacy of pancreatic kallikrein treatment of early-onset preeclampsia and which impact of patient D-dimer

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Objective: To analyze the pancreatic kallikrein treatment of early-onset preeclampsia therapeutic effect and impact on patients D-dimer.

Methods: 94 cases of early-onset preeclampsia patients were divided into the control group and the observation group. In the control group patients were treated with magnesium sulfate treatment. In the observation group patients were treated with pancreatic kallikrein based on the control group use of common treatment.

Results: After treatment, D-dimer levels in serum in the observation group patients were lower than that of the control group, significant differences (P<0.01). After treatment, 24 h urine protein, random urine protein/creatinine ratio in urine in the observation group patients were lower than that of the control group, significant differences (P<0.01). The incidence of severe neonatal asphyxia was 4.26% in the observation group patients were lower than that of the control group was 29.79%, significant differences (P<0.01). After treatment, Pregnancy was prolonged (12.43±4.31) days, gestational age newborns (35.84±2.71) weeks, birth weight (2564.21±507.19) g in the observation group patients were higher than that of the control group, significant differences (P<0.01).

Conclusions: Pancreatic kallikrein treatment of early-onset preeclampsia can effectively improve the treatment, ameliorate the hypercoagulable state and renal function of the patients’ blood, extend the number of days of pregnancy, and reduce the incidence of severe neonatal asphyxia.

1. Introduction

Early hairstyle preeclampsia refers to one of the common disease during pregnancy that hypertension and proteinuria occur in pregnant woman whose blood pressure was normal before pregnancy[1]. With early onset, concealing and fast progress, it can seriously leads to maternal and infant complications and threatens the lives of mother and baby[2]. It is reported that the pathogenesis of preeclampsia is probably associated with the thrombus induced by vascular endothelial injury[3]. In the present study, we aimed to treat early hairstyle preeclampsia by pancreatic kallikrein.
difference in both group, which was comparable \((P>0.05)\).

2.2. Treatment and grouping

Patients in both groups were treated with conventional therapy treatments, including bed rest, sedation, depressurization and fetal lung maturating therapies. In control group, patients were also given magnesium sulfate (Hebei Meitu Pharmaceutical Co., Ltd., approved by H13022000); patients were given 20 mL of 0.9% normal saline and 30 mL of 25% magnesium sulfate by microinfusion pump twice a day. In observation group, on the basis of treatment of control group, patients were also given pancreatic kallikrein (Changzhou Qianhong Biochemical Pharmaceutical Co., Ltd., Approved by H20067914) for common treatment. Patients were given 1.5 mL water for injection and injected with 40 U pancreatic kallikrein for twice a day.

2.3. Index observation

The changes of systolic pressure and diastolic blood pressure were observed in two groups before and after treatment. The conditions of PT, APTT, FBG and D-dimer were also observed in two groups\(^4\). The 24 h urine protein, uric acid, urea nitrogen, serum creatinine and urinary albumin to creatinine ratio of the two groups were examined. The pregnancy complications, severe neonatal asphyxia, death of perinatal period and extended days of pregnancy of the two groups patients were observed\(^5\).

2.4. Statistical analysis

Data were analyzed by SPSS 17.0 software. Measurement data were expressed as mean±SD and analyzed by \(t\) test. Enumeration data was analyzed by \(\chi^2\) test. \(P<0.05\) was considered significantly different.

### 3. Result

3.1. Comparison of blood pressure and coagulation function in two groups

After treatment, the blood pressure of patients in both groups was decreased compared with that before treatment, which has significant difference \((P<0.01)\), while the blood pressure and coagulation function of the two groups had no significant difference \((P>0.05)\). The serum D-dimer level of observation group after treatment was lower than that of in control group and the difference was significant \((P<0.01)\) (Table 1).

3.2. Comparison of the renal function in two groups

After treatment, the 24 h urine protein and urinary albumin to creatinine ratio in observation group was lower than that of in control group with significant difference \((P<0.01)\) (Table 2).

3.3. Comparison of complications in patients of two groups

In observation group, the incidence of severe neonatal asphyxia was 4.26\% (2/47), which was lower than that of in control group [29.79\% (14/47)] with significant difference \((P<0.01)\).

3.4. Comparison of outcome of mother and fetus in patients of two groups

After treatment, the extended days of pregnancy (12.43±4.31) d, neonatal gestational age (35.84±2.71) weeks and infant weight (2 564.21±507.19) g in observation group were higher than that in control group (8.04±2.72) d, (32.32±1.51) weeks, and (2 001.36±432.15) g, respectively, which had significant difference \((P<0.01)\).

<table>
<thead>
<tr>
<th>Time</th>
<th>Group</th>
<th>Systolic pressure (mmHg)</th>
<th>Diastolic pressure (mmHg)</th>
<th>FBG (g/L)</th>
<th>PT (s)</th>
<th>APTT (s)</th>
<th>D– dimer ((\mu \text{g/L}))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before treatment</td>
<td>Control ((n=47))</td>
<td>165.51±10.72</td>
<td>105.91±7.32</td>
<td>4.78±0.65</td>
<td>11.51±0.73</td>
<td>33.25±4.04</td>
<td>362.72±194.23</td>
</tr>
<tr>
<td></td>
<td>Observation ((n=47))</td>
<td>168.15±11.22</td>
<td>106.23±8.41</td>
<td>4.69±0.71</td>
<td>11.52±0.56</td>
<td>33.51±4.12</td>
<td>353.13±210.24</td>
</tr>
<tr>
<td>(t)</td>
<td>1.166</td>
<td>0.197</td>
<td>0.641</td>
<td>0.075</td>
<td>0.309</td>
<td>0.230</td>
<td></td>
</tr>
<tr>
<td>(P)</td>
<td>&gt;0.05</td>
<td>&gt;0.05</td>
<td>&gt;0.05</td>
<td>&gt;0.05</td>
<td>&gt;0.05</td>
<td>&gt;0.05</td>
<td></td>
</tr>
<tr>
<td>After treatment</td>
<td>Control ((n=47))</td>
<td>130.82±11.25*</td>
<td>96.76±6.37*</td>
<td>4.61±0.70</td>
<td>11.87±2.27</td>
<td>33.72±5.13</td>
<td>354.51±178.32</td>
</tr>
<tr>
<td></td>
<td>Observation ((n=47))</td>
<td>129.51±9.16*</td>
<td>97.95±7.02*</td>
<td>4.91±0.97</td>
<td>12.76±2.35</td>
<td>33.85±4.71</td>
<td>253.10±179.32</td>
</tr>
<tr>
<td>(t)</td>
<td>0.619</td>
<td>0.861</td>
<td>1.719</td>
<td>1.867</td>
<td>0.128</td>
<td>2.749</td>
<td></td>
</tr>
<tr>
<td>(P)</td>
<td>&gt;0.05</td>
<td>&gt;0.05</td>
<td>&gt;0.05</td>
<td>&gt;0.05</td>
<td>&gt;0.05</td>
<td>&lt;0.01</td>
<td></td>
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</tbody>
</table>
4. Discussion

Preeclampsia is a disease during pregnancy that hypertension and proteinuria occur in pregnant women whose blood pressure was normal before pregnancy[6]. Early hairstyle preeclampsia is one of the common diseases during the pregnancy and puer-peral period, which easily leads to a variety of complications in pregnant women and fetus[7]. Systemic small artery spasm is the basic pathophysiological change of hypertensive disorder complicating pregnancy[8]. Clinical features of pregnancy-induced hypertension are the abnormal elevation of blood pressure and urine protein[9]. Renal lesion is one of the common complications in early hairstyle preeclampsia, and 24 h urine protein is one of the important indicators to assess the degree of kidney damage in preeclampsia[10]. Antithrombotic therapy is generally used for clinical treatment of early-onset preeclampsia[11]. In the present study, we found that the 24 h urine protein in observation group after treatment was (12.53±1.32) g/24 h, which was significantly lower than that of in control group (31.12±2.21) g/24 h. This illustrated that pancreatic kallikrein can effectively improve the treatment of early hairstyle preeclampsia and prevent the incidence of kidney disease. We also found that the blood pressure of the patients in two groups had no significant difference, which showed that pancreatic kallikrein did not have obvious advantage in treating the blood pressure of early hairstyle preeclampsia, but it had antithrombotic function and obvious effect of dredging microcirculation and maintaining heart, liver, kidney and the placenta.

D-dimer is a kind of specific degradation products generated by cross-linked fibrin with the action of fibrinolysin, which is a specific process of fibrinolytic markers[12]. D-dimer will increase as long as the activated thrombosis and fiber dissolving activity are formed in body's blood vessels[13]. In the present study, we found that the D-dimer level in observation group after treatment was (253.10±179.32) μg/L, which was significantly lower than that of in control group (354.51±178.32) μg/L. This illustrated that pancreatic kallikrein can effectively decrease the D-dimer level in the treatment of early hairstyle preeclampsia. It was also found that the incidence of severe neonatal asphyxia in observation group (4.26%) was significantly lower than that of in control group (29.79%), and the extended days of pregnancy, neonatal gestational age and weight were obviously better than that of in control group. This indicated that pancreatic kallikrein can effectively decrease the incidence of severe neonatal asphyxia, extend the days of pregnancy and increase the neonatal weight. We believe that this may be because of Kallidinogenase, also called kallikrein or pancreatic kallikrein, which is a kind of proteolytic enzyme extracted from animal pancreas and is composed of 18 amino acids and sugars. Pancreatic kallikrein can make kininogen degrade into plasmakinin so as to dilate blood vessels, improve micirculation and regulate blood pressure. Meanwhile, as the activating factor, pancreatic kallikrein can also activate the plasminogen to prevent blood clotting and thrombus[14].

In conclusion, pancreatic kallikrein treatment of early-onset preeclampsia can effectively improve the treatment, ameliorate the hypercoagulable state and renal function of the patients’ blood, extend the number of days of pregnancy, and reduce the incidence of severe neonatal asphyxia.

References