Analysis of montelukast in combined with extended care applied in children with bronchial asthma

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Objective: To explore the application effect of montelukast in combined with extended care in children with bronchial asthma.

Methods: A total of 80 children with bronchial asthma who were admitted in our hospital from May, 2014 to May, 2015 were included in the study and randomized into the observation group and the control group with 40 cases in each group. The patients in the two groups were given routine treatments and pidotimod granules. On this basis, the patients in the observation group were given additional montelukast and extended care after discharge. The fasting peripheral venous blood before treatment and 3 months after treatment in the two groups was collected. The immunoturbidimetry was used to detect the serum IgA, IgG, and IgM. The pulmonary function detector was used to detect FEV1, FVC, and PEF. Follow-up visits were paid to record the asthma attack times, readmission rate, re-first aid rate, and first aid times after discharge within 1 year.

Results: IgA and IgG after treatment in the two groups were significantly elevated (P<0.05), while IgM had no significant change (P>0.05). The elevated degree of IgA and IgG in the observation group was significantly greater than that in the control group (P<0.05). FEV1 (L), FVC (L), and PEF (L/min) after treatment in the two groups were significantly elevated when compared with before treatment (P<0.05). The elevated degree of FEV1, FVC, and PEF in the observation group was significantly greater than that in the control group (P<0.05). The asthma attack times, readmission rate, re-first aid rate, and first aid times after discharge within 1 year in the observation group were significantly lower than those in the control group (P<0.05).

Conclusions: The routine treatment in combined with montelukast can better effectively control the symptoms in children with asthma, and improve the pulmonary function. After discharge, the extended care can be more beneficial to control the asthma attack, and enhance the living quality.

1. Introduction

Bronchial asthma is a common chronic respiratory disease in childhood, with a long course, about 1/3-1/2 of which can delay to the adult, which can severely affect the physical and mental health and family life quality[1]. Currently, much attention is paid to the asthma attack control and health education in the clinic in children with bronchial asthma, no attention of which after discharge can cause the instability of condition control, and the repeated attack[2]. Some researches demonstrate that LT plays a vital role in the pathogenesis of bronchial asthma. Montelukast and pidotimod are the drugs commonly used in the treatment of bronchial asthma in children in the clinic. Montelukast can block the inflammation-causing effect of CyIts, effectively improve the pulmonary function, and control the asthma attack. Pidotimod can regulate the balance of Th1 and Th2, enhance the immunological function, and reduce the occurrence rate of respiratory infection. The study is aimed to explore the application effect of montelukast in combined with extended care in children with bronchial asthma.

Corresponding author: Xue Li (1972-), Female, M.B., Associate Chief Nurse. Tel: 13933027448 E-mail: lirxin1972@163.com Foundation Project: The study was supported by the Scientific and Technological Achievement Project of Hebei Province with the number of 20120747.
2. Materials and methods

2.1. General materials

A total of 80 children with bronchial asthma who were admitted in our hospital from May, 2014 to May, 2015 were included in the study, among which 36 were male, and 44 were female; aged from 6 to 12 years old; course from 1 to 3 years old, with an average course of (1.4±0.5) years old. All the patients were in accordance with the diagnostic criteria of bronchial asthma[3], and informed consents were obtained from all the relatives. Those who had heart, liver, and kidney diseases, and non-hormone dependent treatments were excluded from the study.

2.2. Methods

The patients were randomized into the observation group and the control group with 40 cases in each group. The difference of age, gender, and course between the two groups was not statistically significant (P>0.05). The patients in the two groups were given pidotimod granules (produced by Zhejiang Xinju Pharmaceutical Co. Ltd, Approval No. H20030325), 0.4 g/time, 2 times/d, instead of 1 time/d after 1 week, and routine treatments. On this basis, the patients in the observation group were given montelukast (produced by Lunan Beite Pharmaceutical Co. Ltd, Approval No. H20083372), 4 mg/time, 1 time/d, and extended care after discharge. The extended care content were in the following[4,5]: (1) daily management: appropriately opening the widow for ventilation, maintaining the environment clean, comfortable, hygiene, and appropriate temperature; reducing the exposure to allergens to prevent the respiratory infection; avoiding eating seafood, milk, egg, and other allergic and irritable food, and being suitable to have slight diet rich in vitamins, and forming good diet habits; (2) psychological counseling: guiding patients related psychological knowledge by telephone, listening to light music, learning to communicate with others to distract attention, alleviating the children’s mental stress, giving psychological comfort to children, and citing successful cases to enhance their confidence to overcome the disease; (3) medication guidance: guiding relatives and children to accurately grasp the inhalation therapy, persisting in long-term and standard inhalation therapy, reminding and helping relatives to obey the prescribed medication, avoiding adding or subtracting the dosage at will and withdrawing the drugs by themselves; (4) exercise guidance: guaranteeing adequate sleep, appropriate exercise, not suitable to vigorous exercise, strengthen the physique, and enhance the adaptability and tolerance to the environment; (5) prevention guidance: emphasis on prevention, timely increasing or decreasing clothes according to the climate, performing cold-proof and warm keeping, preventing to catch a cold to induce the attack of asthma, and reducing the attack times and severity degree; (6) extended care sequential guidance: reasonable arrangements were performed according to the children’s specific conditions, and paying a return visit to the clinic for patients with no explanation and aggravated conditions.

2.3. Observation indicators

The fasting peripheral venous blood before treatment and 3 months after treatment in the two groups was collected. The immunoturbidimetry was used to detect the serum IgA, IgG, and IgM. The pulmonary function detector was used to detect FEV1, FVC, and PEF. Follow-up visits were paid to record the asthma attack times, readmission rate, re-first aid rate, and first aid times after discharge within 1 year.

2.4. Statistical analysis

SPSS 18.0 software was used for the statistical analysis. The measurement data were expressed as mean±SD, and t test was used. Chi-square test was used for the enumeration data. P<0.05 was regarded as statistically significant difference.

3. Results

3.1. Comparison of immunological function before and after treatment between two groups

IgA and IgG after treatment in the two groups were significantly elevated (P<0.05), while IgM showed no significant change (P>0.05). The elevated degree of IgA and IgG in the observation group was significantly greater than that in the control group (P<0.05) (Table 1).

3.2. Comparison of pulmonary function before and after treatment between two groups

FEV1, FVC, and PEF after treatment in the two groups were significantly elevated (P<0.05), when compared with before treatment (P<0.05). The elevated degree of FEV1, FVC, and PEF in the observation group was significantly greater than that in the control group (P<0.05) (Table 2).

3.3. Comparison of asthma attack within 1 year through follow up visit

The asthma attack times, readmission rate, re-first aid rate, and

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### Table 1

Comparison of immunological function before and after treatment between two groups (g/L).

<table>
<thead>
<tr>
<th>Groups</th>
<th>n</th>
<th>Time</th>
<th>IgA</th>
<th>IgG</th>
<th>IgM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observation</td>
<td>40</td>
<td>Before treatment</td>
<td>1.07±0.12</td>
<td>7.16±1.75</td>
<td>1.45±0.31</td>
</tr>
<tr>
<td>Control</td>
<td>40</td>
<td>Before treatment</td>
<td>1.81±0.17</td>
<td>13.16±1.24</td>
<td>1.47±0.28</td>
</tr>
<tr>
<td></td>
<td></td>
<td>After treatment</td>
<td>1.05±0.27</td>
<td>7.21±1.46</td>
<td>1.43±0.24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>After treatment</td>
<td>1.37±0.18</td>
<td>9.72±1.83</td>
<td>1.45±0.35</td>
</tr>
</tbody>
</table>

*P<0.05, when compared with before treatment; #P<0.05, when compared with the control group.
Table 2
Comparison of pulmonary function before and after treatment between two groups.

<table>
<thead>
<tr>
<th>Groups</th>
<th>n</th>
<th>Time</th>
<th>FEV1 (L)</th>
<th>FVC (L)</th>
<th>PEF (L/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observation group</td>
<td>40</td>
<td>Before treatment</td>
<td>1.27±0.53</td>
<td>2.34±1.25</td>
<td>1.98±0.59</td>
</tr>
<tr>
<td></td>
<td></td>
<td>After treatment</td>
<td>3.16±0.24&lt;sup&gt;★&lt;/sup&gt;</td>
<td>4.16±0.71&lt;sup&gt;★&lt;/sup&gt;</td>
<td>3.63±0.35&lt;sup&gt;★&lt;/sup&gt;</td>
</tr>
<tr>
<td>Control group</td>
<td>40</td>
<td>Before treatment</td>
<td>1.28±0.48</td>
<td>2.37±0.97</td>
<td>1.97±0.68</td>
</tr>
<tr>
<td></td>
<td></td>
<td>After treatment</td>
<td>2.09±0.27&lt;sup&gt;★&lt;/sup&gt;</td>
<td>3.11±0.52&lt;sup&gt;★&lt;/sup&gt;</td>
<td>2.58±0.32&lt;sup&gt;★&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>★</sup>P<0.05, when compared with before treatment;<sup>★</sup> P<0.05, when compared with the control group.

first aid times after discharge within 1 year in the observation group were (1.28±0.31) times, 7.5% (3), 5.0% (2), and (0.54±0.61) times; while those in the control group were (5.12±0.45) times, 30.3% (12), 22.5% (9), and (2.87±1.12) times. The asthma attack times, readmission rate, re-first aid rate, and first aid times after discharge within 1 year in the observation group were significantly lower than those in the control group (P<0.05).

4. Discussion

Bronchial asthma is a common respiratory disease in the pediatrics in the clinic, whose pathogenesis is associated with the airway inflammation caused by various cytokines, with repeated attack, which can severely affect the children’s physical and mental health[6]. The stimulating factors can stimulate the airway to cause extensive airway spasm and stenosis, inflammatory exudation, mucosa edema, and hypersecretion, and induce asthma attack[7].

Various cells and mediators are involved in the attack of bronchial asthma in children, with airway hyperresponsiveness as its pathological characteristic. Some researches demonstrate that LT plays a vital in the pathogenesis of bronchial asthma. Blocking the combination of LT with its receptors to inhibit the inflammatory reaction can reach the goal of anti-inflammation and anti-asthma. Montelukast, belonging to high selective LT receptor antagonist, can inhibit the eosinophil infiltration, relieve the airway smooth muscle spasm, reduce the vascular permeability, alleviate the respiratory mucosa edema, and improve the pulmonary function in order to reduce the attack of asthma. Moreover, montelukast has functions of anti-inflammation, immunoregulation, and pulmonary function improvement. Pidotimod, as an immunoregulation mediator, can promote the phagocytic activity of neutrophils and macrophages, enhance the chemotaxis, regulate the imbalance of T cell subsets, activate NK cells, strengthen the anti-infection activity, inhibit the inflammatory reaction, and alleviate the asthma symptoms. The results in the study showed that the elevated degree of IgA and IgG in the observation group was significantly greater than that in the control group (P<0.05); the elevated degree of FEV1, FVC, and PEF in the observation group was significantly greater than that in the control group (P<0.05), suggesting that montelukast in combined with pidotimod can effectively control the asthma symptoms, and improve the pulmonary function. The extended care is a kind of newtype nursing concept. The whose sequential nursing can provide children with continuous follow-up visit and guidance. Establishment of extended care center can regularly provide children with follow-up visit by telephone, and accurate evaluation can be performed. Detailed guidance is conducted according to the children’s specific conditions to achieve better therapeutic effect, and promote the rehabilitation[9]. The results in the study showed that the asthma attack times, readmission rate, re-first aid rate, and first aid times after discharge within 1 year in the observation group were significantly lower than those in the control group (P<0.05), indicating that the extended care is more suitable for the rehabilitation in children with bronchial asthma.

In conclusion, the routine treatment in combined with montelukast can better effectively control the symptoms in children with asthma, and improve the pulmonary function. After discharge, the extended care can be more beneficial to control the asthma attack, and enhance the living quality.

References