Application analysis of pidotimod in the treatment of allergic rhinitis in children accompanied by allergic asthma

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Abstract

Objective: To observe the application effect of pidotimod in the treatment of allergic rhinitis in children accompanied by allergic asthma. Methods: A total of 60 children with allergic rhinitis accompanied by allergic asthma who were admitted in our hospital from January, 2013 to January, 2015 were included in the study and randomized into the treatment group and the control group with 30 cases in each group. The patients in the two groups were given routine treatments in combined with sublingual immunotherapy. On this basis, the patients in the treatment group were given additional pidotimod. The immunological function, inflammatory cytokine level, and pulmonary function improvement in the two groups were observed. Results: The immunological function, inflammatory cytokine level, and pulmonary function improvement in the treatment group were significantly superior to those in the control group. Conclusions: Pidotimod can significantly enhance the immunological function in children with allergic rhinitis in children accompanied by allergic asthma, alleviate the inflammatory reaction, and promote the pulmonary function improvement, with an accurate efficacy.

1. Introduction

Allergic rhinitis (AR) and asthma belong to the allergic diseases, have cross connections in the epidemiology and pathological immunity, and are even deemed to the homologous disease induced by the allergens[1,2]. The symptomatic treatment is mainly involved in the treatment of AR and asthma in the clinic, but the efficacy is different, with a easy recurrence[3]. Due to the incomplete maturity of immune system in children with AR and asthma, much attention should be paid to the regulation of immunological function during the treatment process[4]. Pidotimod is a newtype artificially synthetized dipeptide with high purity, has broad immunological enhancement, can not only promote the non-specific immunity, but also can promote the specific immunity in order to play the strong anti-bacterial and anti-viral effect[5,6]. The study is aimed to observe the application effect of pidotimod in the treatment of allergic rhinitis in children accompanied by allergic asthma.

2. Materials and methods

2.1. Clinical materials

A total of 60 children with allergic rhinitis accompanied by allergic asthma who were admitted in our hospital from January, 2013 to January, 2015 were included in the study, among which 35 were male, and 25 were female; aged from 5 to 14 years old, with an average age of 8 years old; course from 6 months to 5 years, with an average age of 2 years; 45 had intermittent allergic rhinitis symptoms, and 15 had persistent allergic rhinitis symptoms; 33 had mild rhinitis, 29 had moderate rhinitis, and 8 had severe rhinitis; asthma course from 3 months to 4 years, with an average course of 1 years; 51 had intermittent asthma symptoms, and 9 had persistent asthma symptoms; 26 had mild asthma, 31 had moderate asthma, and 3 had severe asthma. All the patients were in accordance with the diagnostic criteria of allergic rhinitis in children in the Diagnostic and Treatment Guideline of Allergic Rhinitis in Children[7] and the Diagnostic Criteria of Bronchial Asthma in the Diagnostic and Treatment Guideline of Asthma in Children[8]. The
2.2. Methods

The patients were randomized into the treatment group and the control group with 30 cases in each group. The patients in the two groups were given routine symptomatic treatments in GINA and IRIA Guidelines, and sublingual administration of dermatophagoides farinae drops (produced by Zhejiang WOLW PHARM, Approval No. S20060012, Specification: 2 mL (1 000 ug/mL)), swallowing after 1-3 min, 1 time/d, with an increasing dosage within 1 to 3 weeks. No. 1 was taken on the first week, No. 2 was taken on the second week, No. 3 was taken on the third week, 1, 2, 3, 4, 6, 8, and 10 drops according to the instructions every 1-7 d. No. 4 was taken on the fourth week, 1 time/d, 3 drops/time, No. 5 was taken from the sixth week or following the doctor’s advice, 1 time/d, 2 drops/time. The treatment was maintained for 1 year. During the treatment process, if there was an acute attack of asthma or other acute diseases, the dosage of dermatophagoides farinae drops was timely adjusted, meanwhile, positive symptomatic treatments were given. On this basis, the patients in the treatment groups were given pidotimod (produced by DOPPEL FARMACEUTICI S.r.l., Approval No. H20090934), 0.4 g/time, every 1 time in the morning and evening, adjusting to 1 time before breakfast after 1-week administration. Four-week treatment was regarded as one course, continuously for 3 weeks.

2.3. Observation indicators

ELISA was used to detect IgM, IgA, and IgG levels before treatment and 3 courses after treatment. FCM was used to detect CD3+, CD4+, and CD8+ levels, and CD4+/CD8+ was calculated.

2.4. Statistical analysis

SPSS 18.0 software was used for the statistical analysis. The measurement data were expressed as mean ± SD. The group t test was used for the comparison among groups, and paired t test was used for the intra-group comparison. The enumeration data were expressed as percentage, and chi-square test was used. P<0.05 was regarded as statistically significant.

3. Results

3.1. Comparison of the immunological indicators before and after treatment

IgM(g/L), IgG(g/L), IgA(g/L), CD3+(%), CD4+(%), and CD4+/CD8+ after treatment in the two groups were significantly elevated when compared with before treatment (P<0.05), while CD8+(%) level was significantly reduced (P<0.05). The improved degree of various indicators after treatment in the treatment group was significantly superior to that in the control group (P<0.05) (Table 1).

3.2. Comparison of the inflammatory cytokine levels before and after treatment

CRP (mg/L), IL-8 (pg/mL), and TNF- α (pg/mL) levels after treatment in the two groups were significantly reduced when compared with before treatment (P<0.05). CRP, IL-8, and TNF- α levels were reduced compared with before treatment (P<0.05) (Table 2).
**Table 3**

Comparison of the pulmonary function before and after treatment (%).

<table>
<thead>
<tr>
<th>Groups</th>
<th>Time</th>
<th>FEV1</th>
<th>PEF</th>
<th>PEF25</th>
<th>PEF50</th>
<th>PEF75</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>Before treatment</td>
<td>71.15±1.86</td>
<td>72.18±1.76</td>
<td>51.35±1.38</td>
<td>51.98±1.36</td>
<td>46.26±1.18</td>
</tr>
<tr>
<td></td>
<td>After treatment</td>
<td>90.18±2.15*</td>
<td>91.35±1.88*</td>
<td>78.36±1.65*</td>
<td>79.68±1.76*</td>
<td>72.24±1.38*</td>
</tr>
<tr>
<td>Control</td>
<td>Before treatment</td>
<td>71.12±2.05</td>
<td>72.45±1.86</td>
<td>51.64±1.56</td>
<td>52.08±1.75</td>
<td>46.45±1.38</td>
</tr>
<tr>
<td></td>
<td>After treatment</td>
<td>82.36±2.68*</td>
<td>83.25±3.56</td>
<td>68.25±1.36*</td>
<td>70.35±1.86*</td>
<td>65.35±2.38*</td>
</tr>
</tbody>
</table>

*P<0.05, when compared with before treatment; *P<0.05, when compared with the control group.

levels after treatment in the treatment group were significantly lower than those in the control group (P<0.05) (Table 2).

### 3.3. Comparison of the pulmonary function before and after treatment

FEV1, PEF, PEF25, PEF50, and PEF75 after treatment in the two groups were significantly increased when compared with before treatment (P<0.05). FEV1, PEF, PEF25, PEF50, and PEF75 after treatment in the treatment group were significantly higher than those in the control group (P<0.05) (Table 3).

### 4. Discussion

Allergic rhinitis is an inflammatory disease of nasal mucosa mediated by IgE and driven by Th2 after exposure to inhaled allergens, with main manifestations of running nose, sneezing, rhinocesmus, and nasal congestion, with an increasing morbidity and daily aggravating burden, and has been the global health issue[9]. Currently, the main prevention principal of allergic rhinitis is the combination of prevention and control, and quaternity[10]. With the application of drug therapy, specific immunotherapy, and surgical treatment, a preferable control of its attack has been achieved, but there are still no methods for the thorough curing[11]. During the treatment process, the organized and planned health education to the children and parents should be performed from psychology, medication, diet, environment to appropriate exercise in order to realize the individualized management of nursing scheme.

Bronchial asthma is short for asthma, is a chronic inflammatory disease of airway with inflammatory cells, airway structure cells, and cell components[12]. Currently, it is widely believed that the allergic rhinitis and asthma have the similar immunological and pathological mechanisms, and highly consistent pathological change[13]. The immunotherapy is the only etiological treatment recommended by WHO, with a fully affirmed efficacy. Due to being placed in the key stage of growth and development and immature immune system in children, the expression levels of IgG, IgA, and other immune factors with protecting effects are low, and the immunological function is low, the pathogenic infection is easy to be caused, and the balance of T lymphocyte subsets is destroyed, leading to the immunological dysfunction; therefore, special attention should be paid to the regulation of immunological function in children during the treatment process[14]. Pidotimod is a kind of new-type immunostimulant, can strengthen the non-specific and specific immunoreaction, heighten the cellular immune response through stimulating IL-2 and γ-interferon, activate the natural killer cells, strengthen the phagocytosis of phagocytes to enhance their chemotaxis, increase CD4+ number, recover CD4+/CD8+, promote the lymphocyte proliferation caused by mitogens, activate the complements, and strengthen the opsonization of C3[15]. Pidotimod has an accurate efficacy in the treatment of respiratory disease, bacterial infectious disease, and viral infectious disease, with a high safety, convenient medication, and good tolerance. The results in the study showed that the immunological function, inflammatory cytokine level, and pulmonary function improvement in the treatment group were significantly superior to those in the control group (P<0.05), indicating that the routine treatments in combined with pidotimod can enhance the immunological function in children with allergic rhinitis accompanied by asthma, alleviate the inflammatory reaction, promote the improvement of pulmonary function, and enhance the efficacy.

In conclusion, on the basis of routine treatments, pidotimod can significantly enhance the immunological function in children with allergic rhinitis in children accompanied by allergic asthma, alleviate the inflammatory reaction, and promote the pulmonary function improvement; therefore, it deserves to be widely recommended in the clinic.

### References


