doi: 10.3978/j.issn.2095-6959.2019.07.009
View this article at: http://dx.doi.org/10.3978/j.issn.2095-6959.2019.07.009

舌下含服粉尘螨滴剂联合氯雷他定治疗儿童过敏性哮喘伴变应性鼻炎的疗效及机制

闫晶晶

(陆军军医大学第二附属医院耳鼻咽喉科，重庆 400037)

[摘　要]　**目的：**观察儿童过敏性哮喘伴变应性鼻炎应用舌下免疫疗法(sublingual immunotherapy，SLIT)联合氯雷他定治疗效果及其作用机制。**方法：**选取80例过敏性哮喘伴变应性鼻炎患儿，按照随机数字法则分为联合治疗组和标准治疗组，其中标准治疗组给予氯雷他定进行治疗，联合治疗组患儿给予舌下含服粉尘螨滴剂联合氯雷他定治疗，治疗前和治疗后3个月，对患儿的哮喘和鼻炎严重程度、肺通气功能进行评价，对比两组患儿的免疫因子、T淋巴细胞亚群和炎症指标。**结果：**治疗前，两组患儿哮喘症状评分、鼻炎症状评分、肺通气功能、免疫因子、T淋巴细胞亚群和炎症指标差异无统计学意义(P>0.05)；治疗后两组哮喘症状评分和鼻炎症状评分均明显低于治疗前(P<0.05)，且联合治疗组与标准治疗组相比更低，差异具有统计学意义(P<0.05)；两组FEV1，FVC和PEF均明显高于治疗前(P<0.05)，且联合治疗组明显高于标准治疗组，差异具有统计学意义(P<0.05)；两组IFN-γ水平均明显升高，IL-4和IL-17水平均明显下降(P<0.05)，联合治疗组变化最为显著，与标准治疗组相比，差异具有统计学意义(P<0.05)；两组IgE水平均明显下降，IgG4水平均明显升高(P<0.05)，联合治疗组变化最为显著，与标准治疗组相比，差异具有统计学意义(P<0.05)；两组患儿的$CD3^+$，$CD4^+$及$CD4^+/CD8^+$水平均明显升高，$CD8^+$水平均明显下降(P<0.05)，联合治疗组变化最为显著，和标准治疗组相比，差异具有统计学意义(P<0.05)。**结论：**舌下含服粉尘螨滴剂联合氯雷他定治疗小儿变应性鼻炎合并哮喘效果显著，提高免疫功能、降低炎症反应和促进肺功能改善可能是其作用机制。

[关键词]　哮喘；变应性鼻炎；炎性指标；免疫功能；粉尘螨滴剂

Clinical effect and its mechanism of sublingual administration of dust mite drops combined with loratadine in the treatment of children with allergic asthma complicated with allergic rhinitis

YAN Jingjing

(Department of Otolaryngology, Army Military Medical University Second Affiliated Hospital, Chongqing 400037, China)

Abstract　**Objective:** To observe the efficacy and mechanism of the treatment of children with allergic asthma complicated

收稿日期 (Date of reception)：2019–01–15
通信作者 (Corresponding author)：闫晶晶，Email: yanjingjinglj@163.com

with allergic rhinitis with sublingual immunotherapy combined with loratadine. **Methods:** Eighty cases of children with allergic asthma complicated with allergic rhinitis were selected and divided into a combined treatment group and a standard treatment group according to the method of random numbers. The standard treatment group was treated with loratadine, and the combined treatment group was treated with sublingual administration of dust mite drops combined with loratadine. Before and after the treatment for 3 months, the severity of asthma and rhinitis, pulmonary ventilation function of the patients were evaluated; the immune factors, T lymphocyte subgroup and inflammation index between the two groups were compared. **Results:** Before the treatment, the asthma symptom scores, rhinitis symptom scores, pulmonary ventilation function, immune factors, T lymphocyte subgroup and inflammation index had no statistical significance (P>0.05); after the treatment, asthma symptom scores and rhinitis symptom scores were significantly lower than those before the treatment (P<0.05), and the scores in the joint treatment group were significantly lower than those in the standard treatment group (P<0.05); FEV1, FVC and PEF were significantly higher than those before the treatment in the two groups (P<0.05), and the levels in the combined treatment group was significantly higher than those in the standard treatment group (P<0.05). IFN-γ level was significantly increased in both groups, and IL-4 and Il-17 levels were significantly decreased (P<0.05), the changes in the combined treatment group were more significant than those in the standard treatment group (P<0.05). IgE level was significantly decreased and IgG4 level were significantly increased in both groups (P<0.05), and the changes were more significant in the combined treatment group when compared with the standard treatment group (P<0.05). $CD3^+$, $CD4^+$ and $CD4^+/CD8^+$ levels were significantly increased and $CD8^+$ levels were significantly decreased in the two groups (P<0.05); the changes were more significant in the combined treatment group when compared with the standard treatment group (P<0.05). **Conclusion:** Sublingual dust mite drops combined with fratadine in the treatment of pediatric allergic rhinitis with asthma has a significant effect.

Keywords asthma; allergic rhinitis; inflammatory index; immune function; dust mite drops

变应性鼻炎(allergic rhinitis，AR)和过敏性哮喘(allergic asthma，AS)是临床常见的呼吸道疾病[1]。数据[2]显示近十年来由尘螨引起的过敏性哮喘和变应性鼻炎发病率呈逐年递增趋势，对患儿的身心健康造成极大的影响，同时也给家庭和社会带来沉重的负担。氯雷他定作为治疗过敏性皮肤病的常用药物，不仅能够抑制组胺释放，还能降低炎症介质合成，稳定细胞膜因此临床也常将其作为治疗变应性鼻炎合并哮喘的药物[3]。文献[4-5]报道称变异性鼻炎以及哮喘患儿的气道分泌物中存在大量的IgE，其既是疾病的主要病理特征也是引起病情发展的重要媒介。由于儿童的免疫系统尚未发育成熟，呼吸道中具有保护作用的免疫因子IgG等均处于较低的水平，所以容易受病原菌感染[6]。临床常采用变应原特异性免疫治疗，其主要是通过舌下免疫治疗(sublingual immunotherapy，SLIT)。因此本研究将二者联合应用观察舌下含服粉尘螨滴剂联合氯雷他定治疗小儿哮喘合并变应性鼻炎的效果及作用机制。

1 对象与方法

1.1 对象

2015年9月至2017年5月在陆军军医大学第二附属医院收治哮喘合并变应性鼻炎患儿作为研究对象。纳入标准：1)符合《儿童变应性鼻炎诊断和治疗指南》[7](2010年中华医学会耳鼻咽喉分会在重庆制定)中的变应性鼻炎诊断标准和《儿童支气管哮喘的诊断及治疗》[8]中的支气管哮喘诊断标准；2)能够准确表述自己症状，依从性好；3)过敏原皮试阳性。排除标准：1)有支气管哮喘病史或变应性疾病家族史；2)入组前4周经口服糖皮质激素或其他免疫调节剂治疗；3)急性发作期的危重度哮喘患儿；4)智力发育迟缓，伴随有精神障碍。本次研究共纳入80例患儿，年龄6~16(10.5±3.1)岁，男46例，女34例，体重25~45(45.67±10.29) kg，其中50例>30 kg，30例≤30 kg。按照随机数字法则分为两组，每组40例，其中联合治疗组年龄7~16(10.7±3.2)岁，男24例，女16例，体重25~45(45.72±10.28) kg，

其中26例>30 kg，14例≤30 kg；标准治疗组年龄6~16(10.4±2.9)岁，男22例，女18例，体重在25~45(45.61±10.11) kg，其中24例>30 kg，16例≤30 kg。两组一般资料差异无统计学意义(P>0.05)。本研究经陆军军医大学第二附属医院医学伦理委员会批准。

1.2 方法

两组接受丙酸氟替卡松气雾剂(商品名：辅舒酮，葛兰素史克制药有限公司，国药准字H20010387)。标准治疗组在基础治疗的基础之上，口服氯雷他定(商品名：开瑞坦，上海先灵葆雅制药有限公司，国药准字H10970410)，剂量为患儿>30 kg，10 mg/(次·d)；患儿≤30 kg，5 mg/(次·d)。

联合治疗组在标准治疗组的基础之上再给予SLIT，即在夜间睡前30 min于舌下滴注标准化粉尘螨变应原滴剂，在舌下保持1~3 min然后吞下。递增期：在第1周使用滴剂1号(1 μg/mL)、第2周给予滴剂2号(10 μg/mL)、第3周给予滴剂3号(100 μg/mL)，第1~7天分别滴入1，2，3，4，6，8，10滴。在维持阶段，年龄<14岁的给予滴剂4号(330 μg/mL)，3滴/次，年龄≥14周岁的患儿给予滴剂5号(1 000 μg/mL)，2滴/次，连续治疗1年。

1.3 评价指标

分别于治疗前和治疗后3个月对患儿的哮喘和鼻炎严重程度、肺通气功能进行评价，同时留取患儿的外周血，用于免疫因子、T淋巴细胞亚群和炎症指标检测。

1.3.1 哮喘和鼻炎严重程度评价标准

鼻炎症状评分标准[9]，该评分标准包含流涕、鼻塞、打喷嚏、咽痒、眼痒和鼻痒6个症状，每个症状评分为0~3，其中0分表示无症状；1分表示症状轻微不影响日常活动和睡眠；2分表示症状明显影响到日常活动；3分表示症状严重且影响到日常活动和夜间睡眠。各症状评分相加即为鼻炎症状总评分。哮喘严重程度评分标准[10]，该评分标准包含急性发作严重程度、夜间症状、日常活动影响、活动受限程度、β2-受体激动剂应用5个方面，其中β2-受体激动剂应用评分为1~3，其余均为0~4分。5个方面评分相加即为哮喘严重程度总评分。

1.3.2 肺通气功能

采用AS-507肺功能仪检测患儿肺功能指标水平，即第1秒用力呼气容积(forced expiratory volume in one second，FEV1)、用力肺活量(forced vital capacity，FVC)和峰值呼气流速(peak expiratory flow，PEF)。

1.3.3 IgE和IgG4、T淋巴细胞亚群免疫炎性因子检测

采用BNII全自动蛋白分析仪测定免疫球蛋白E和免疫球蛋白G4浓度，采用流式细胞仪检测$CD3^+$，$CD4^+$，$CD8^+$以及$CD4^+/CD8^+$，免疫炎性因子IFN-γ，IL-4以及IL-17采用ELISA法进行检测。

1.4 统计学处理

采用软件SPSS 16.0对实验数据进行分析，计量资料采用均数±标准差($\bar{x}\pm s$)来表示，组间比较采用独立t检验，组内治疗前后对比采用配对t检验，计数资料组间比较采用χ^2检验。P<0.05表示差异具有统计学意义。

2 结果

2.1 两组治疗前后哮喘和鼻炎严重程度评分对比

两组治疗前哮喘症状评分和鼻炎症状评分差异无统计学意义(P>0.05)；治疗后两组哮喘症状评分和鼻炎症状评分均明显低于治疗前(P<0.05)，且联合治疗组与标准治疗组相比更低，差异具有统计学意义(P<0.05，表1)。

2.2 两组治疗前后肺通气功能对比

两组治疗前FEV1，FVC和PEF差异无统计学意义(P>0.05)，治疗后两组患儿的FEV1、FVC和PEF均明显高于治疗前(P<0.05)，且联合治疗组明显高于标准治疗组，差异具有统计学意义(P<0.05，表1)。

2.3 两组治疗前后 IFN-γ，IL-4 及 IL-17 水平比较

治疗前两组IFN-γ，IL-4及IL-17水平差异无统计学意义(P>0.05)；治疗后两组IFN-γ水平均明显升高，IL-4和IL-17水平均明显下降(P<0.05)，联合治疗组变化最为显著，与标准治疗组相比，差异具有统计学意义(P<0.05，表2)。

2.4 两组治疗前后 IgE 和 IgG4 水平比较

治疗前两组IgE和IgG4水平差异无统计学意义(P>0.05)；治疗后两组IgE水平均明显下降，IgG4水平均明显升高(P<0.05)；联合治疗组变化最为显著，与标准治疗组相比，差异具有统计学意义(P<0.05，表2)。

2.5 两组治疗前后 $CD3^+$，$CD4^+$，$CD8^+$ 以及 $CD4^+/CD8^+$ 比较

治疗前两组$CD3^+$，$CD4^+$，$CD8^+$以及$CD4^+/CD8^+$水平差异无统计学意义($P>0.05$)；治疗后两组$CD3^+$，$CD4^+$及$CD4^+/CD8^+$水平均明显升高，$CD8^+$水平均明显下降($P<0.05$)；联合治疗组变化最为显著，与标准治疗组相比，差异具有统计学意义($P<0.05$，表3)。

表1 两组治疗前后哮喘和鼻炎严重程度评分、肺通气功能对比($n=40$)

Table 1 Comparison of severity scores of asthma and rhinitis and pulmonary ventilation function before and after treatment between the two groups ($n=40$)

组别	哮喘症状评分	鼻炎症状评分	FEV1/L	FVC/L	PEF/($L\cdot s^{-1}$)
联合治疗组					
治疗前	5.62 ± 0.67	8.63 ± 0.89	1.22 ± 0.17	2.43 ± 0.29	4.08 ± 0.41
治疗后	2.17 ± 0.32*#	3.13 ± 0.76*#	2.19 ± 0.31*#	3.54 ± 0.36*#	5.77 ± 0.46*#
标准治疗组					
治疗前	5.69 ± 0.61	8.58 ± 0.91	1.23 ± 0.15	2.44 ± 0.31	4.04 ± 0.41
治疗后	3.28 ± 0.57*	4.73 ± 0.74*	1.78 ± 0.17*	2.87 ± 0.34*	4.84 ± 0.44*

与治疗前相比，*$P<0.05$；与标准治疗组相比，#$P<0.05$。

Compared with before the treatment, *$P<0.05$; compared with the normal treatment group, #$P<0.05$.

表2 两组治疗前后IFN-γ，IL-4，IL-17以及IgE和IgG4水平比较($n=40$)

Table 2 Comparison of IFN-γ, IL-4, IL-17, IgE and IgG4 levels before and after treatment between the two groups ($n=40$)

组别	IFN-γ/($pg\cdot mL^{-1}$)	IL-4/($pg\cdot mL^{-1}$)	IL-17/($pg\cdot mL^{-1}$)	IgE/($g\cdot L^{-1}$)	IgG4/($g\cdot L^{-1}$)
联合治疗组					
治疗前	5.61 ± 0.42	11.23 ± 1.24	45.53 ± 3.11	280.91 ± 31.21	0.53 ± 0.11
治疗后	8.01 ± 0.81*#	5.13 ± 0.76*#	20.89 ± 3.10*#	189.13 ± 28.19*#	0.89 ± 0.10*#
标准治疗组					
治疗前	5.72 ± 0.41	11.03 ± 1.51	45.62 ± 3.12	281.03 ± 30.54	0.52 ± 0.12
治疗后	6.28 ± 0.37*	9.13 ± 1.14*	38.61 ± 3.08*	268.13 ± 29.14*	0.61 ± 0.08*

与治疗前相比，*$P<0.05$；与标准治疗组相比，#$P<0.05$。

Compared with before the treatment, *$P<0.05$; compared with the normal treatment group, #$P<0.05$.

表3 两组治疗前后$CD3^+$，$CD4^+$，$CD8^+$以及$CD4^+/CD8^+$比较($n=40$)

Table 3 Comparison of $CD3^+$, $CD4^+$, $CD8^+$ and $CD4^+/CD8^+$ before and after treatment between the two groups ($n=40$)

组别	$CD3^+$/%	$CD4^+$/%	$CD8^+$/%	$CD4^+/CD8^+$
联合治疗组				
治疗前	51.21 ± 6.22	30.51 ± 4.11	28.22 ± 3.71	1.23 ± 0.31
治疗后	69.11 ± 7.14*#	38.81 ± 4.10*#	24.59 ± 2.10*#	1.69 ± 0.30*#
标准治疗组				
治疗前	51.03 ± 6.31	30.52 ± 4.12	28.29 ± 3.56	1.24 ± 0.32
治疗后	58.17 ± 7.15*	35.62 ± 4.08*	26.61 ± 2.15*	1.38 ± 0.33*

与治疗前相比，*$P<0.05$；与标准治疗组相比，#$P<0.05$。

Compared with before the treatment, *$P<0.05$; compared with the normal treatment group, #$P<0.05$.

3 讨论

变应性鼻炎属于一种由IgE参与介导的I型变态反应疾病，Th17细胞受损的反应在变应性鼻炎的发生和激素抵抗中起着举足轻重的作用，变应原与抗原递呈细胞和肥大细胞表面的IgE结合，引起Th1，Th2以及Th17细胞免疫反应出现失衡[11]。有报道[12]称Th2细胞释放的IL-4免疫炎症因子，对IgE的水平具有调节作用。IFN-γ是由Th1细胞分泌，可以抑制IL-4诱导IgE的合成，因此IL-4和IFN-γ二者平衡才能保证免疫反应处于稳定状态。目前临床治疗变应性鼻炎的原则是“防控结合，四位一体”，尚未有彻底根治的方案。变应性鼻炎常常会合并哮喘，因此二者发生密切相关，尤其在儿童当中[13]。变应性鼻炎和哮喘的免疫病理机制、变态反应和病理改变相同，多数学者[14-15]均认为变应性鼻炎是支气管哮喘的高危因素，二者对药物的反应高度一致，因此临床强调二者协同治疗。

免疫疗法作为WHO推荐的唯一治疗变应性鼻炎和哮喘的手段，主要是调节体液和细胞免疫平衡，抑制Th2免疫反应，刺激Th1反应，从而达到治疗的目的[16]。文献[17]报道称应变原特异性治疗在变应性鼻炎、哮喘等变态反应性疾病中疗效确切。临床常用的免疫疗法有5种，分别是皮下免疫治疗(subcutaneous immunotherapy，SCIT)、SLIT、口服免疫治疗、鼻内免疫以及气管免疫治疗，最常用的是SCIT和SLIT。粉尘螨滴剂的主要成分为粉尘螨变应原活性蛋白，多采用舌下含服后吞咽，能够达到皮下注射的效果。哮喘和变应性鼻炎相互作用会对肺通气功能造成损害，且鼻炎加重时炎性细胞分泌物形成后鼻漏吸入肺内，会进一步的加重哮喘，恶化肺通气功能[18]。FEV1，FVC和PEF可以直观反映通气功能，当气道受阻，FEV1，FVC和PEF会出现下降，本研究结果显示治疗后联合治疗组FEV1，FVC和PEF水平明显升高，与邱若庆等[19]研究结果一致，联合治疗后患儿的同期功能得到明显改善，同时联合治疗组的哮喘和鼻炎严重程度评分明显低于标准治疗组，提示舌下含服粉尘螨滴剂联合氯雷他定能够明显缓解通气功能障碍，改善病情。

研究[20-21]表明：IFN-γ能够增强吞噬细胞的杀伤能力，同时还能促进IgE的表达，抑制IgG4的表达，而IL-4也是IgE合成刺激剂，能够促进IgG4转变为IgE，同时增强B淋巴细胞合成IgE，因此本研究检测治疗前后IgE和IgG4水平，结果显示治疗后两组IgE水平均明显下降，IgG4水平均明显升高，联合治疗组最为显著。小儿免疫系统发育尚未成熟，其呼吸道的免疫蛋白和保护因子水平降低，免疫功能低下，容易受到病原菌感染，从而破坏T淋巴细胞亚群平衡，引起机体免疫功能出现紊乱[22]。本研究结果显示治疗后两组$CD3^+$，$CD4^+$及$CD4^+/CD8^+$水平均明显升高，$CD8^+$水平均明显下降，联合治疗组变化最为显著，和标准治疗组相比，差异具有统计学意义。文春秀等[23]也发现粉尘螨滴剂能够通过调节机体的T淋巴细胞亚群平衡来治疗过敏性鼻炎，进一步提示舌下含服粉尘螨滴剂在治疗小儿变应性鼻炎合并哮喘中有显著优势，其优势在细胞因子水平、免疫球蛋白和T淋巴细胞亚群中得到了证实。

综上所述，舌下含服粉尘螨滴剂联合氯雷他定治疗小儿变应性鼻炎合并哮喘效果显著，提高免疫功能、降低炎症反应和促进肺功能改善可能是其作用机制。

参考文献

1. Wang XD, Zheng M, Lou HF, et al. An increased prevalence of self-reported allergic rhinitis in major Chinese cities from 2005 to 2011[J]. Allergy, 2016, 71(8): 1170-1180.
2. Lee SM, Gao B, Dahl M, et al. Decreased FoxP3 gene expression in the nasal secretions from patients with allergic rhinitis[J]. Otolaryng Head Neck, 2016, 140(2): 197-201.
3. 李小敏, 洪海裕, 郭剑玲, 等. 变应性鼻炎特异性免疫治疗远期疗效评价及氯雷他定预防性用药的疗效观察[J]. 广东医学, 2014, 35(2): 282-284.
   LI Xiaomin, HONG Haiyu, GUO Jianling, et al. Evaluation of long-term efficacy of specific immunotherapy for allergic rhinitis and observation of curative effect of loratadine prophylaxis[J]. Guangdong Medical Journal, 2014, 35(2): 282-284.
4. 林航, 车淑玉, 林荣军, 等. 变应性鼻炎患儿舌下免疫治疗的疗效分析[J]. 临床耳鼻咽喉头颈外科杂志, 2016, 30(3): 230-232.
   LIN Hang, CHE Shuyu, LIN Rongjun, et al. Analysis of the efficacy of sublingual immunotherapy in children with allergic rhinitis[J]. Journal of Clinical Otolaryngology, 2016, 30(3): 230-232.
5. Anderson AE, Swan DJ, Wong OY, et al. Tolerogenic dendritic cells generated with dexamethasone and vitamin D3 regulate rheumatoid arthritis CD4+ T cells partly via transforming growth factor-β1[J]. Clin Exp Immunol, 2017, 187(1): 113-123.
6. Yu S, Han B, Liu S, et al. Derp1-modified dendritic cells attenuate allergic inflammation by regulating the development of T helper type1

(Th1)/Th2 cells and regulatory T cells in a murine model of allergic rhinitis[J]. Mol Immunol, 2017, 90: 172-181.

7. 中华耳鼻咽喉头颈外科杂志编辑委员会鼻科组, 中华医学会耳鼻咽喉头颈外科学分会鼻科学组, 小儿学组. 儿童变应性鼻炎诊断和治疗指南(2010年重庆)[J]. 中华耳鼻咽喉头颈外科杂志, 2011, 46(1): 7-8.
Chinese journal of otolaryngology, head and neck surgery editorial board, division of rhinology, division of rhinology, branch of otolaryngology, head and neck surgery, Chinese medical association, division of pediatrics. Guidelines for the diagnosis and treatment of allergic rhinitis in children (Chongqing, 2010)[J]. Chinese Journal of Otorhinolaryngology Head and Neck Surgery, 2011, 46(1): 7-8.
8. 陈育智. 儿童支气管哮喘的诊断及治疗[M]. 北京: 人民卫生出版社, 2010.
CHEN Yuzhi. Diagnosis and treatment of bronchial asthma in children[M]. Beijing: People's Health Publishing House, 2010.
9. 马迪辉, 张耀强, 赖微微. 广州番禺区成人支气管哮喘合并过敏性鼻炎的流行病学调查分析[J]. 中国现代药物应用, 2017, 11(12):186-188.
MA Dihui, ZHANG Yaoqiang, LAI Weiwei. Epidemiological investigation and analysis of adult bronchial asthma with allergic rhinitis in panyu district, guangzhou[J]. China Modern Drug Application, 2017, 11(12):186-188.
10. 余雷, 资文杰. 哮喘患者血清高敏C-反应蛋白与哮喘控制测试评分相关性研究[J]. 成都医学院学报, 2012, 7(2): 273-275.
YU Lei, ZI Wenjie. Relation between serum high-sensitivity C-reactive protein level and asthma control test score between the correlation research patients with asthma[J]. Journal of Chengdu Medical College, 2012, 7(2): 273-275.
11. Xu F, Yu S, Qin M, et al. Hydrogen-rich saline ameliorates allergic rhinitis by reversing the imbalance of Th1/Th2 and up-regulation of CD4+CD25+Foxp3+ regulatory T cells, interleukin-10, and membrane-bound transforming growth factor-β in guinea pigs[J]. Inflammation, 2018, 41(1): 81-92.
12. Jerzynska J, Stelmach W, Rychlik B, et al. The clinical effect of vitamin D supplementation combined with grass-specific sublingual immunotherapy in children with allergic rhinitis[J]. Allergy Asthma Proc, 2016, 37(2): 105-114.
13. 万弦, 崔玉霞, 黄玉瑛,等. SLIT治疗儿童过敏性哮喘合并变应性鼻炎的临床疗效观察[J]. 重庆医学, 2016, 45(8): 1086-1088.
WAN Xian, CUI Yuxia, HUANG Yuying, et al. SLIT treatment of allergic asthma combined with allergic rhinitis in children: a clinical observation of efficacy[J]. Chongqing Medical Journal, 2016, 45(8): 1086-1088.
14. 陈艳洋, 曾莺, 邓丽莎. 培元生金通窍汤联合西药治疗儿童支气管哮喘合并变应性鼻炎疗效观察[J]. 海南医学, 2016, 27(24): 4039-4041.
CHEN Yanyang, ZENG Ying, DENG Lisha. Observation on the efficacy of pei-yuan-sheng jin tongqiao tang combined with western medicine in the treatment of children's bronchial asthma complicated with allergic rhinitis[J]. Hainan Medical Journal, 2016, 27(24): 4039-4041.
15. Allen KJ, Koplin JJ, Ponsonby AL, et al. Vitamin D insufficiency is associated with challenge-proven food allergy in infants[J]. J Allergy Clin Immun, 2013, 131(4): 1109-1116.
16. 杨旺盛, 杨敬平, 李桂平. 特异性免疫治疗在变应性鼻炎合并哮喘治疗中的地位和作用[J]. 临床肺科杂志, 2013, 18(4): 723-724.
YANG Wangsheng, YANG Jingping, LI Guiping. Role of specific immunotherapy in the treatment of allergic rhinitis with asthma[J]. Journal of Clinical Pulmonary Medicine, 2013, 18(4): 723-724.
17. 邓邦鱼. 变应性鼻炎和变应性鼻炎合并支气管哮喘特异性免疫治疗的疗效研究[J]. 临床耳鼻咽喉头颈外科杂志, 2015, 29(12): 1090-1093.
DENG Bangyu. Efficacy study of specific immunotherapy for allergic rhinitis and allergic rhinitis combined with bronchial asthma[J]. Clinical Journal of Otolaryngology Head and Neck Surgery, 2015, 29(12): 1090-1093.
18. 皇惠杰, 刘晓颖, 侯晓玲, 等. 尘螨变应原免疫治疗联合药物治疗对哮喘合并变应性鼻炎患儿临床疗效及气道高反应性的影响[J]. 首都医科大学学报, 2016, 37(5): 568-573.
HUANG Huijie, LIU Xiaoying, HOU Xiaoling, et al. Effects of dust mite allergy immunotherapy on clinical efficacy and airway hyperresponsiveness in allergic asthma and rhinitis children sensitized to dust mite[J]. Journal of Capital University of Medical Sciences, 2016, 37(5): 568-573.
19. 邱若庆, 吴湘萍, 李洁, 等. 舌下含服粉尘螨滴剂联合氯雷他定治疗小儿哮喘合并变应性鼻炎的通气功能及血生化指标评估[J]. 海南医学院学报, 2017, 23(6): 782-785.
QIU Ruoqing, WU Xiangping, LI Jie, et al. Assessment of ventilation function and blood biochemical indexes of sublingual dust mite drops combined with loratadine in the treatment of pediatric asthma with allergic rhinitis[J]. Journal of Hainan Medical College, 2017, 23(6): 782-785.
20. Živković Z, Djurić-Filipović I, Živanović S. Current issues on sublingual allergen-specific immunotherapy in children with asthma and allergic rhinitis[J]. Srp Ark Celok Lek, 2016, 144(5/6): 345-350.
21. Elhanafi S, Ma GK, Kerner C, et al. 313-novel approach for dysplasia evaluation in IBD surveillance with the application of chromoendoscopy-guided probe based confocal laser endomicroscopy: Prospective cohort study[J]. Gastroenterology, 2017, 152(5): S81.
22. Elliott J, Kelly SE, Johnston A, et al. Allergen immunotherapy for the treatment of allergic rhinitis and/or asthma: an umbrella review[J].

CMAJ Open, 2017, 5(2): E373.

23. 文春秀, 谢小娟, 甘金梅, 等. 粉尘螨滴剂通过改善机体免疫功能治疗过敏性鼻炎[J]. 中国免疫学杂志, 2016, 32(2): 244-246.
WEN Chunxiu, XIE Xiaojuan, GAN Jinmei, et al. Treatment of allergic rhinitis with dust mite drops by improving immune function[J]. Chinese Journal of Immunology, 2016, 32(2): 244-246.

本文引用： 闫晶晶. 舌下含服粉尘螨滴剂联合氯雷他定治疗儿童过敏性哮喘伴变应性鼻炎的疗效及机制[J]. 临床与病理杂志, 2019, 39(7): 1441-1447. doi: 10.3978/j.issn.2095-6959.2019.07.009

Cite this article as: YAN Jingjing. Clinical effect and its mechanism of sublingual administration of dust mite drops combined with loratadine in the treatment of children with allergic asthma complicated with allergic rhinitis[J]. Journal of Clinical and Pathological Research, 2019, 39(7): 1441-1447. doi: 10.3978/j.issn.2095-6959.2019.07.009