

doi: 10.13241/j.cnki.pmb.2024.03.032

宣肺解痉清热方治疗青年热哮患者疗效及其预后影响因素分析*

彭飞飞¹ 观云² 田雪娇¹ 韩培英¹ 郭洁¹

(河北省中医院 1呼吸科;2呼吸重症科 河北石家庄 050000)

摘要 目的:探究宣肺解痉清热方治疗青年热哮患者疗效及其预后影响因素。**方法:**选择2019年10月~2021年9月本院收治的60例青年热哮患者为本次研究对象,依据不同治疗方法将其分为2组,观察组,n=30,对照组,n=30。对照组在吸氧、化痰等常规治疗基础上,依据其严重程度,开展布地奈德福莫特罗粉吸入剂治疗。观察组在对照组基础上,增加宣肺解痉清热方辅助治疗。比较组间治疗前后相关因子、成人哮喘生存质量评分表(AQLQ)、治疗效果,并依据患者预后效果,将其分为预后良好组(n=40)及预后不佳组(n=20),对热哮患者预后予以单因素分析,并开展 Logistic 回归分析,判断影响预后的独立因素。**结果:**治疗前,观察组及对照组白细胞介素-4(IL-4)、干扰素- γ (IFN- γ)、FEV₁第1秒用力呼气容积/用力肺活量(FEV₁/FVC)水平及AQLQ评分比较无差异($P>0.05$),治疗后,与治疗前比较,IL-4水平均降低,且观察组水平更低,IFN- γ 水平、FEV₁/FVC水平及AQLQ评分均升高,且观察组水平更高($P<0.05$);观察组治疗有效率较对照组高($P<0.05$);青年热哮预后影响因素分析中,结果显示,病程、BMI、过敏性鼻炎、遗传因素、起病年龄、呼吸道感染次数、吸烟史、发作频率等因素均是影响热哮预后的单因素($P<0.05$),依从性、皮肤湿疹、给药途径均未对热哮预后效果产生较大影响($P>0.05$);将影响热哮预后的单因素予以赋值,纳入 Logistic 回归分析,以病程、BMI、过敏性鼻炎、遗传因素、起病年龄、呼吸道感染次数、吸烟史、发作频率为自变量,结果显示,病程、BMI、过敏性鼻炎、遗传因素、吸烟史、发作频率是影响热哮预后的独立因素($P<0.05$)。**结论:**宣肺解痉清热方可有效调节青年热哮患者机体炎症因子及肺功能,提高生活质量及治疗效果,依据热哮患者预后效果,病程、BMI、过敏性鼻炎、遗传因素、吸烟史、发作频率是影响热哮预后的独立因素,可予以针对性干预,以提升患者预后效果。

关键词:宣肺解痉清热方;青年患者;热哮喘;预后

中图分类号:R562.25;R243 文献标识码:A 文章编号:1673-6273(2024)03-568-06

Analysis on The Curative Effect and Prognostic Factors of Xuanfei Jieasmolasqingrefang in the Treatment of Young Patients with Heat Asthma*

PENG Fei-fei¹, GUAN Yun², TIAN Xue-jiao¹, HAN Pei-ying¹, GUO Jie¹

(1 Department of Respiration; 2 Department of Respiratory Intensive Care, Hebei Hospital of Traditional Chinese Medicine,

Shijiazhuang, Hebei, 050000, China)

ABSTRACT Objective: To explore the efficacy and prognostic factors of Xuanfei Jiaoqi Qingre decoction in the treatment of young patients with hot wheezing. **Methods:** Sixty young patients with febrile croup admitted to our hospital from October 2019 to September 2021 were selected as the subjects of this study, and they were divided into 2 groups according to different treatment methods, observation group, n=30, and control group, n=30. The control group was treated with budesonide formoterol powder inhalation based on their severity on the basis of conventional treatment such as oxygenation and sputum dissolution. In the observation group, based on the control group, the adjuvant treatment of Xuanfei antispasmodic and clearing heat formula was added. The relevant factors, adult asthma survival quality rating scale (AQLQ) and treatment effect were compared before and after treatment between the groups, and the patients were divided into good prognosis group (n=40) and poor prognosis group (n=20) according to their prognosis effect, and the prognosis of patients with febrile croup was analyzed unilaterally and logistic regression analysis was conducted to determine the independent factors affecting prognosis. **Results:** Before treatment, there was no difference in the comparison of interleukin-4 (IL-4), interferon- γ (IFN- γ), FEV₁ st second expiratory volume/exertional spirometry (FEV₁/FVC) levels and AQLQ scores between the observation and control groups ($P>0.05$), after treatment, compared with before treatment, IL-4 levels were lower in the observation group, and IFN- γ levels, FEV₁/FVC levels and AQLQ scores were higher in the observation group, and the levels were higher in the observation group ($P<0.05$); Treatment group effective rate in the observation group was higher than control group ($P<0.05$); In the analysis of influencing factors for the prognosis of hot wheezing in adolescents, the results showed that the course of disease, BMI, allergic rhinitis, genetic factors, age of onset, number of respiratory tract infections, smoking history, and frequency of attacks were all single factors affecting the prognosis of hot wheezing ($P<0.05$). Compliance, skin eczema and route of administration did not have a great influence on the prognosis of hot

* 基金项目:河北省中医药管理局科研计划项目(2020025)

作者简介:彭飞飞(1986-),女,硕士研究生,主治医师,研究方向:中西医结合治疗呼吸系统疾病,E-mail:fdms3368238@163.com

(收稿日期:2023-06-10 接受日期:2023-06-30)

wheeze ($P>0.05$)。The single factors affecting the prognosis of heat asthma were assigned values and included in the Logistic regression analysis. The course of disease, BMI, allergic rhinitis, genetic factors, age of onset, frequency of respiratory tract infection, smoking history and frequency of attack were used as independent variables. Course, BMI, allergic rhinitis, genetic factors, smoking history, seizure frequency is the independent factors influencing the prognosis of hot xiao ($P<0.05$). **Conclusions:** Xuanfei spasmolysis heat can effectively regulate young fever patients body inflammation factor and lung function, improve the quality of life and treatment effect, according to the prognosis of effect in patients with fever, course, BMI, allergic rhinitis, genetic factors, smoking history, attack frequency is an independent factor affecting the prognosis of fever, can be targeted intervention, to improve the prognosis effect in patients.

Key words: Xuanfei Jieasmolasqingrefang; Young Patients; Heat asthma; Prognosis

Chinese Library Classification(CLC): R562.25; R243 **Document code:** A

Article ID: 1673-6273(2024)03-568-06

前言

近年,随着人们生活方式的改变及空气质量降低,支气管哮喘病发病率呈现逐年上升趋势,据流行病学研究显示,目前我国支气管哮喘的发病率约为 2.1%,对人们的身体健康产生严重影响,值得广泛关注^[1,2]。支气管哮喘是一种以气道高反应性、气道重塑、气道受阻为主要特征的支气管慢性炎症,现阶段,临床尚未得出诱发支气管哮喘的相关机制,但随着对支气管哮喘疾病的深入性研究,临床认为,气道慢性炎症、免疫稳态失衡等是导致其发病的重要因素^[3,4]。现国内外对支气管哮喘的治疗手段多以糖皮质激素及联合受体激动剂等为主要治疗手段,可在一定程度上扩张支气管,减轻气道高反应及气流受阻等症状,但由于哮喘为终身性疾病,长期应用会导致患者出现不同程度的激素抵抗、骨质疏松,还会增加感染风险,影响治疗效果^[5,6]。中医辨证学将临床支气管哮喘,归于“喘证”、“哮病”范畴,且急性发作期多以热哮喘为常见证型,并依据热哮喘的病机特点,认为临床应以疏风解痉、清宣理肺为主要干预方向^[7]。宣肺解痉清热方具有平喘清肺,解痉祛风之功,可达标本兼治之效^[8]。但由于热哮喘为终身性疾病,因此了解其预后及影响预后的危险因素是确保患者生活质量提升的关键。鉴于此,本研究拟讨论宣肺解痉清热方治疗青年热哮患者疗效及其预后影响因素,现报道如下:

1 资料与方法

1.1 一般资料

选择 2019 年 10 月~2021 年 9 月本院收治的 60 例青年热哮患者为本次研究对象,依据不同治疗方法将其分为 2 组,观察组, $n=30$, 对照组, $n=30$ 。观察组年龄 19-35 岁,平均(28.56±4.01)岁;男 17 例、女 13 例;病程 2-9 年,平均(4.91±0.59)年;体质量指数(BMI)21-30 kg/m²,平均(24.56±2.12)kg/m²;对照组年龄 19-34 岁,平均(27.98±3.95)岁;男 15 例、女 15 例;病程 1.5-9 年,平均(5.52±0.66)年;体质量指数(BMI)22.3-30.5 kg/m²,平均(24.62±2.17)kg/m²。组间基线资料比较($P>0.05$)。

纳入标准:(1)均符合哮喘相关诊断标准^[9];(2)符合中医辨证中热哮喘指征,主要症状包括喘息气粗、喉中痰鸣如吼、咳呛;次症状有口苦、咯痰色白或黄、常口渴、胸高胁胀、舌苔黄腻、伴身热、舌质红等;(3)经肺功能指标、病史、临床表现及影像学检查确诊为热哮喘;(4)对药物无不良表现;(5)知情同意。排除标准:(1)合并肝肾功能障碍;(2)伴随心功能异常;(3)合

并恶性肿瘤;(4)支气管发育异常;(5)合并支气管异物、支气管感染等疾病;(6)近期开展免疫治疗;(7)认知及精神异常。

1.2 方法

对照组在吸氧、化痰等常规治疗基础上,应用予吸入布地奈德福莫特罗粉吸入剂(商品名:信必可都保,生产企业:AstraZeneca AB,规格:160 μg/4.5 μg)治疗,每次 1 吸,bid。4 周为 1 疗程,共治疗 1 疗程。

观察组在对照组基础上,增加宣肺解痉清热方辅助治疗,方剂组成如下:防风 12 g,荆芥 10 g,蝉蜕 10 g,僵蚕 12 g,地龙 10 g,陈皮 10 g,清半夏 10 g,厚朴 10 g,灸麻黄 6 g,苦杏仁 8 g,炙甘草 6 g,桑白皮 10 g,浙贝母 10 g,瓜蒌 10 g,黄连 6 g,日 1 剂,早晚各 200 mL 温服。4 周为 1 疗程,共治疗 1 疗程。

1.3 观察指标

(1)因子水平及生活质量分析:分别于治疗前后,利用抗凝试管对两组患者开展 5 mL 空腹肘静脉血采集,以 3000 r/min 的离心速率,15 min 离心时间及 10 cm 的离心半径开展常规离心处理,离心结束后,利用无菌试管采集上层血清,并置于 -70℃ 环境待检。利用双抗体夹心酶联免疫吸附试验(试剂盒厂家:江西艾博因生物科技有限公司)检验白细胞介素 -4(IL-4)、干扰素 - γ (IFN- γ)指标水平;使用肺功能检测仪检测 FEV₁ 第 1 秒用力呼气容积/用力肺活量(FEV₁/FVC);生存质量测定运用“成人哮喘生存质量评分表(AQLQ)”进行评估。

(2)治疗效果分析:依据《中药新药临床研究指导原则(试行)》^[10]标准,评估临床治疗效果,治疗后,患者热哮喘相关症状得到改善,但仍需接受支气管扩张剂或糖皮质激素干预为显效;治疗后,患者热哮喘相关症状存在好转,仍需及接受支气管扩张剂及糖皮质激素干预为有效;治疗后,患者热哮喘相关症状未见好转,甚至出现加重为无效;有效率=(显效+有效)/例数×100%。

(3)对所以患者开展一般资料问卷调查,并结合患者病例资料及影像学资料收集信息,包括病程、BMI、过敏性鼻炎、遗传因素、起病年龄、呼吸道感染次数、吸烟史、发作频率、依从性、皮肤湿疹、给药途径等资料。

(4)开展 Logistic 回归分析,分析影响热哮患者预后的独立风险因素。

1.4 统计学方法

应用 SPSS20.0,以表示计量资料,采用 t 检验;计数资料用百分比表示,采用 χ^2 检验,多因素予以 Logistic 回归方程予以分析, $P<0.05$ 为差异具有统计学意义。

2 结果

2.1 宣肺解痉清热方治疗热哮对相关因子水平的调及生活质量的影响分析

治疗前, 观察组及对照组 IL-4、IFN- γ 、FEV₁/FVC 水平及 AQLQ 评分比较无差异($P>0.05$), 治疗后, 与治疗前比较, IL-4 水平均降低, 且观察组水平更低, IFN- γ 水平、FEV₁/FVC 水平及 AQLQ 评分均升高, 且观察组水平更高($P<0.05$), 见表 1。

表 1 宣肺解痉清热方治疗热哮对相关因子水平的调及生活质量的影响($\bar{x} \pm s$)

Table 1 The regulation of related factors and the quality of life($\bar{x} \pm s$)

Groups	IFN- γ (pg/mL)		t	P	IL-4(pg/mL)		t	P
	Pre-treatment	Post-treatment			Pre-treatment	Post-treatment		
Observation group(n=30)	111.44 \pm 11.21	134.89 \pm 9.21	64.220	<0.001	6.19 \pm 1.03	3.40 \pm 0.50	28.833	<0.001
Control group (n=30)	116.40 \pm 10.51	129.65 \pm 9.62	81.543	<0.001	6.41 \pm 1.06	5.01 \pm 0.83	33.340	<0.001
t	1.768	2.155	-	-	0.815	9.101	-	-
P	0.082	0.035	-	-	0.418	<0.001	-	-

续表 1

Continuation table 1

Groups	FEV ₁ /FVC(%)		t	P	AQLQ grade		t	P
	Pre-treatment	Post-treatment			Pre-treatment	Post-treatment		
Observation group(n=30)	50.45 \pm 4.91	67.38 \pm 7.04	10.804	<0.001	4.32 \pm 0.26	5.72 \pm 1.31	5.742	<0.001
Control group (n=30)	50.53 \pm 5.01	63.15 \pm 6.55	10.681	<0.001	4.33 \pm 0.27	5.14 \pm 0.64	6.387	<0.001
t	0.062	2.409			0.146	2.179		
P	0.951	0.019			0.884	0.035		

2.2 宣肺解痉清热方治疗热哮的疗效

观察组高于对照组($P<0.05$), 见表 2。

观察组治疗有效率为 93.33%, 对照组治疗有效率为 73.33%,

表 2 宣肺解痉清热方治疗热哮的疗效[n(%)]

Table 2 The curative effect of Xuanfei Jieasmolasingrefang in the treatment of asthma[n(%)]

Groups	Apparent effect	Effective	Void	Effective rate
Observation group(n=30)	18(60.00)	10(33.33)	2(6.67)	28(93.33)
Control group(n=30)	13(43.33)	9(30.00)	8(26.67)	22(73.33)
t	-	-	-	4.320
P	-	-	-	0.038

2.3 影响热哮患者预后单因素分析

青年热哮预后影响因素分析中, 结果显示, 病程、BMI、过敏性鼻炎、遗传因素、起病年龄、呼吸道感染次数、吸烟史、发作频率等因素均是影响热哮预后的单因素($P<0.05$), 依从性、皮肤湿疹、给药途径均未对热哮预后效果产生较大影响($P>0.05$), 见表 3。

2.4 热哮预后效果 Logistic 回归分析

将影响热哮预后的单因素予以赋值, 纳入 Logistic 回归分析, 以病程、BMI、过敏性鼻炎、遗传因素、起病年龄、呼吸道感染次数、吸烟史、发作频率为自变量, 结果显示, 病程、BMI、过敏性鼻炎、遗传因素、吸烟史、发作频率是影响热哮预后的独立危险因素($P<0.05$), 见表 4。

3 讨论

现代医学研究认为, 支气管哮喘发病多由于结构细胞、炎性因子、趋化因子等联合作用导致, 进一步诱发气道高反应、气道气流受阻及慢性炎症等症状, 而中医辨证研究表明, 哮喘为主因伏痰内蕴, 而肺失宣降、痰热胶结, 二者病理过程相似^[11-13]。糖皮质激素治疗哮喘可有效缓解临床症状, 且用时较短, 便于操作, 但长时间使用会产生依赖性, 影响依从性, 而基于常规治疗的基础上, 增加宣肺解痉清热方辅助治疗, 可产生协同作用, 二者优势互补, 减少糖皮质激素的不良影响, 标本兼治, 提升疾病治疗效果, 改善患者预后^[14,15]。

表 3 影响热哮患者预后单因素分析
Table 3 Analysis of single factors influencing prognosis of patients with heat asthma

Clinical index	Good prognosis group (n=40)	Poor prognosis group (n=20)	Statistical value	P
Course of disease (years)	3.25± 1.21	6.25± 2.01	t=7.211	<0.001
BMI(kg/m ²)				
<28	26(65.00)	7(35.00)	$\chi^2=4.849$	0.028
≥28	14(35.00)	13(65.00)		
Allergic rhinitis				
Yes	14(35.00)	14(70.00)	$\chi^2=6.563$	0.010
No	26(65.00)	6(30.00)		
Genetic factor				
Yes	15(37.50)	13(65.00)	$\chi^2=4.051$	0.044
No	25(62.50)	7(35.00)		
Compliance				
Better	24(60.00)	8(40.00)	$\chi^2=2.143$	0.143
Poor	16(40.00)	12(60.00)		
Age of onset (years)				
19-25	13(32.50)	13(65.00)	$\chi^2=5.735$	0.017
26-35	27(67.50)	7(35.00)		
Eczema cutis				
Yes	14(35.00)	11(55.00)	$\chi^2=2.194$	0.139
No	26(65.00)	9(45)		
Route of administration				
Oral administration	17(42.50)	12(60.00)	$\chi^2=1.635$	0.201
Inhalation	23(57.50)	8(40.00)		
Number of respiratory infections (time)				
<5	30(75.00)	6(30.00)	$\chi^2=11.250$	0.001
≥5	10(25.00)	14(70.00)		
Smoking history				
Yes	11(27.50)	13(65.00)	$\chi^2=7.813$	0.005
No	29(72.50)	7(35.00)		
Attack frequency (times/month)				
≤2	24(60.00)	6(30.00)	$\chi^2=4.800$	0.029
>2	16(40.00)	14(70.00)		

本研究结果显示, 治疗前, 观察组及对照组 IL-4、IFN- γ 、FEV₁/FVC 水平及 AQLQ 评分比较无差异, 治疗后, 与治疗前比较, IL-4 水平均降低, 且观察组水平更低, IFN- γ 水平、FEV₁/FVC 水平及 AQLQ 评分均升高, 且观察组水平更高。这一研究结果同侯硕^[9]等相关研究中, 利用 " 宣肺解痉、化浊解毒法 " 治疗支气管哮喘对血清因子的改善效果一致。分析原因在于, 热哮喘反复发作的原因主要是因为网络调控过程中, 细

胞因子受到炎性因子、趋化因子、炎症细胞的相关作用, 而出现调控异常, 损伤上皮细胞、暴露黏膜下神经、增厚基底层胶原纤维, 导致气道重塑, 发生恶性循环^[17,18]。宣肺解痉为君, 臣药为炒苦杏仁、炒紫苏子、厚朴、瓜蒌、清半夏降气化痰, 佐以桑白皮、黄芩、浙贝母、枇杷叶清热化痰, 地龙、蝉蜕加强解痉之功, 炙甘草为使药调和诸药。全方以清热化痰为主, 并配以辛温药物, 平调寒热, 使热痰得出。并以宣肺为主, 配以降气, 使气机宣降条

表 4 热哮预后效果 Logistic 回归分析
Table 4 Logistic regression analysis of prognosis effect of heat asthma

Independent variable	The assignment
Course of disease (years)	Actual value
BMI(kg/m ²)	<28=0, ≥28=1
Allergic rhinitis	If no =0, if yes =1
Genetic factor	If no =0, if yes =1
Age of onset (years)	19-25=0, 26-35=1
Number of respiratory infections (time)	<5=0, ≥5=1
Smoking history	If no =0, if yes =1
Attack frequency (times/month)	≤2 =0, >2=1

续表 4

Continuation table 4

Independent variable	β	SE	Wald χ^2	OR(95%CI)	P
Course of disease (years)	1.210	0.431	7.767	2.251(0.082~9.517)	0.022
BMI(kg/m ²)	1.205	0.397	6.219	4.029(2.101~8.629)	0.028
Allergic rhinitis	1.162	0.429	12.140	3.769(1.142~10.105)	0.012
Genetic factor	1.305	0.419	8.101	4.625(0.829~7.987)	0.019
Smoking history	1.114	0.425	8.685	3.425(1.105~8.107)	0.020
Attack frequency (times/month)	1.365	0.451	6.202	4.863(2.151~7.924)	0.029

畅,诸药共伍可进一步缓解血管淤积、缓解支气管平滑肌痉挛、改善炎性因子水平,调节机体炎症反应^[19,20]。本研究结果显示,观察组治疗有效率为 93.33%,对照组治疗有效率为 73.33%,观察组高于对照组。郭洁等^[21]相关研究中,针对支气管哮喘患者,予以化痰解毒、宣肺解痉法进行治疗,治疗效果同研究结果类似。分析原因在于,宣肺解痉清热方诸药共伍,可达平喘降逆、解痉祛风、调理气机、清肺止咳、清热疏风之效,标本兼治,在此基础上,联合西药辅以,二者优势互补,增加药效,促进治疗有效率的显著提升^[22,23]。将影响热哮预后的单因素予以赋值,纳入 Logistic 回归分析,结果显示,病程、BMI、过敏性鼻炎、遗传因素、吸烟史、发作频率是影响热哮预后的独立因素。分析原因在于,① 病程:本研究结果中显示,哮喘病程会在一定程度上影响患者的治疗预后,哮喘发作期间,会在一定程度上引发血管收缩,导致心脏负担增加,而病程越长,此种风险发生概率越大,因此,会对预后产生一定影响,但部分研究结果与本研究存在一定差异,应扩大样本,予以进一步研究;② BMI: Xu S 等^[24]相关研究结果显示,肥胖会对哮喘产生一定影响,提升发病频率,而本研究中的 BMI ≥ 28 kg/m² 时即表示当前为肥胖状态,过度肥胖会在一定程度上上抬膈肌,从而增加热哮患者的气道受阻程度,阻碍顺畅呼吸,增加胸闷、咳嗽气喘等疾病症状发生程度,影响患者预后,研究结果与其类似;③ 过敏性鼻炎:患者具有家族遗传过敏史,或自身存在过敏性鼻炎时,其机体的抵抗力及免疫力相较于不过敏体质较低,在外界环境及自身生活习惯的影响下,更易导致哮喘反复,出现持久不愈现象,进而影响

患者预后,结果与 Ohta K 等^[25]相关研究结果类似;④ 遗传因素:据相关研究显示^[26],伴随遗传性哮喘史的患者,发生典型哮喘风险的概率是常规患者的 4.414 倍,而本研究中,结果显示,伴随遗传哮喘病的患者在治疗后,其预后的效果较无遗传病患者相对较差,结果与 García-Menaya JM 等^[27]相关研究结果类似;⑤ 吸烟史:香烟中含有尼古丁成分,会对肺部产生不良影响,而对于哮喘病患者,吸烟会使其症状加重,增加哮喘复发频率,造成哮喘恶化,还会在不同程度上加速肺功能衰退速率,由于吸烟影响气道的自觉能力及心肺功能,可使哮喘患者出现呼吸受阻、呼吸困难等症状,影响其恢复,对预后产生不良影响,结果与 Lee YM 等^[28]相关研究结果类似;⑥ 发作频率: Lietzen R 等^[29]相关研究中,哮喘发作频率会对机体预后产生一定影响,结果与本研究类似。哮喘频繁发作会对机体产生较大影响,导致机体免疫力透支,在不断发作过程中易造成合并性感染,增加继发性细菌感染的风险,影响治疗效果及患者预后^[30]。

综上所述,宣肺解痉清热方可有效调节青年热哮患者机体炎症因子及肺功能,提高生活质量及治疗效果,依据热哮患者预后效果,病程、BMI、过敏性鼻炎、遗传因素、吸烟史、发作频率是影响热哮预后的独立因素,可予以针对性干预,以提升患者预后效果。

参考文献 (References)

[1] Al Ghamdi BR, Koshak EA, Ageely HM, et al. Prevalence and factors associated with adult bronchial asthma in Aseer region, Southwestern Saudi Arabia[J]. Ann Thorac Med, 2019, 14(4): 278-284.

- [2] Yan SF, Yu T, Li FS, et al. Effectiveness and safety of 3 different traditional Chinese therapies for asthma in minors: A protocol for systematic review and network meta-analysis [J]. *Medicine* (Baltimore), 2020, 99(47): 21-29.
- [3] Ruman-Colombier M, Rochat Guignard I, Di Paolo ER, et al. Prevalence and risk factors of lactic acidosis in children with acute moderate and severe asthma, a prospective observational study[J]. *Eur J Pediatr*, 2021, 180(4): 1125-1131.
- [4] Lo D, Beardsmore C, Roland D, et al. Risk factors for asthma attacks and poor control in children: a prospective observational study in UK primary care[J]. *Arch Dis Child*, 2022, 107(1): 26-31.
- [5] Jing X, Yan W, Zeng H, et al. Qingfei oral liquid alleviates airway hyperresponsiveness and mucus hypersecretion via TRPV1 signaling in RSV-infected asthmatic mice [J]. *Biomed Pharmacother*, 2020, (67): 128-140.
- [6] Asano T, Kanemitsu Y, Takemura M, et al. Small airway inflammation is associated with residual airway hyperresponsiveness in Th2-high asthma[J]. *J Asthma*, 2020, 57(9): 933-941.
- [7] Yang H, Zhang C, Gan W, et al. A randomized controlled trial study protocol for Xiao-Qing-Long decoction in the treatment of refractory asthma: Study protocol clinical trial (spirit compliant)[J]. *Medicine* (Baltimore), 2020, 99(5): 911-921.
- [8] Yang WJ, Zeweng YZ, Zhang Y, et al. Analysis on composition principles of Tibetan medicine containing Terminalia chebula by data mining[J]. *China J Chin Mat Med*, 2017, 42(6): 1207-1212.
- [9] 中华医学会呼吸病学分会哮喘学组. 支气管哮喘防治指南(支气管哮喘的定义、诊断、治疗和管理方案) [J]. *中华结核和呼吸杂志*, 2008, 31(3): 177-485.
- [10] 郑筱萸. 中药新药临床研究指导原则(试行)[M]. 北京:中国医药科技出版社, 2002, 32(47): 60-66.
- [11] Sun R, Xu G, Gao D, et al. To Predict Anti-Inflammatory and Immunomodulatory Targets of Guizhi Decoction in Treating Asthma Based on Network Pharmacology, Molecular Docking, and Experimental Validation [J]. *Evid Based Complement Alternat Med*, 2021, 20(46): 903-921.
- [12] Xue B, Zhao Q, Chen D, et al. Network Pharmacology Combined with Molecular Docking and Experimental Verification Reveals the Bioactive Components and Potential Targets of Danlong Dingchuan Decoction against Asthma[J]. *Evid Based Complement Alternat Med*, 2022, 10(67): 271-279.
- [13] Cui J, Lv Z, Teng F, et al. RNA-Seq Expression Analysis of Chronic Asthmatic Mice with Bu-Shen-Yi-Qi Formula Treatment and Prediction of Regulated Gene Targets of Anti-Airway Remodeling[J]. *Evid Based Complement Alternat Med*, 2021, 18(56): 571-579.
- [14] Lyu Y, Chen X, Xia Q, et al. Network Pharmacology-Based Study on the Mechanism of Pinellia ternata in Asthma Treatment [J]. *Evid Based Complement Alternat Med*, 2020, 63(70): 973-976.
- [15] Meurs H, Zaagsma J, Maarsingh H, et al. Recent Patents in Allergy/Immunology: Use of arginase inhibitors in the treatment of asthma and allergic rhinitis[J]. *Allergy*, 2019, 74(6): 1206-1208.
- [16] 侯硕, 郭洁, 冯天骄, 等. 宣肺解痉、化浊解毒法联合西药治疗支气管哮喘疗效及对肺功能和血清 ECP、IgE、IL-4、IFN- γ 的影响[J]. *现代中西医结合杂志*, 2019, 28(32): 3553-3556+3648.
- [17] Wang Y, Chen YJ, Xiang C, et al. Discovery of potential asthma targets based on the clinical efficacy of Traditional Chinese Medicine formulas[J]. *J Ethnopharmacol*, 2020, 24(57): 635-677.
- [18] Ban GY, Kim SC, Lee HY, et al. Risk Factors Predicting Severe Asthma Exacerbations in Adult Asthmatics: A Real-World Clinical Evidence[J]. *Allergy Asthma Immunol Res*, 2021, 13(3): 420-434.
- [19] Zhou L, Lapping S, Liao X, et al. The thromboprotective effect of traditional Chinese medicine Tongji 2 granules is dependent on anti-inflammatory activity by suppression of NF- κ B pathways [J]. *PLoS One*, 2020, 15(11): 607-617.
- [20] 王强, 杨继, 张焱, 等. "清宣理肺、舒风解痉"法对60例支气管哮喘急性发作期热哮患者肺功能、ACT评分及气道炎症因子影响[J]. *辽宁中医杂志*, 2020, 47(2): 113-116.
- [21] 郭洁, 李佃贵, 冯天骄, 等. 化浊解毒、宣肺解痉法治疗支气管哮喘疗效及对炎性细胞因子和下丘脑-垂体-肾上腺轴的影响 [J]. *现代中西医结合杂志*, 2019, 28(31): 3429-3433+3503.
- [22] Chen X, Zhang R, Duan X, et al. Effectiveness of Xiaoyin Jiedu granules in the treatment of psoriasis vulgaris in patients with blood-heat symptom patterns in terms of Traditional Chinese Medicine[J]. *J Tradit Chin Med*, 2020, 40(5): 863-869.
- [23] Wang MH, Chen C, Yeh ML, et al. Using Traditional Chinese Medicine to Relieve Asthma Symptoms: A Systematic Review and Meta-Analysis[J]. *Am J Chin Med*, 2019, 47(8): 1659-1674.
- [24] Xu S, Gilliland FD, Conti DV. Elucidation of causal direction between asthma and obesity: a bi-directional Mendelian randomization study[J]. *Int J Epidemiol*, 2019, 48(3): 899-907.
- [25] Ohta K, Tanaka H, Tohda Y, et al. Asthma exacerbations in patients with asthma and rhinitis: Factors associated with asthma exacerbation and its effect on QOL in patients with asthma and rhinitis[J]. *Allergol Int*, 2019, 68(4): 470-477.
- [26] Diab N, Patel M, O'Byrne P, et al. Narrative Review of the Mechanisms and Treatment of Cough in Asthma, Cough Variant Asthma, and Non-asthmatic Eosinophilic Bronchitis [J]. *Lung*, 2022, 200(6): 707-716.
- [27] García-Menaya JM, Córdoba-Durán C, García-Martín E, et al. Pharmacogenetic Factors Affecting Asthma Treatment Response. Potential Implications for Drug Therapy [J]. *Front Pharmacol*, 2019, 21(46): 520-522.
- [28] Lee YM, Lee JH, Kim HC, et al. Effects of PM10 on mortality in pure COPD and asthma-COPD overlap: difference in exposure duration, gender, and smoking status[J]. *Sci Rep*, 2020, 10(1): 2402-2420.
- [29] Lietzén R, Suominen S, Sillanmäki L, et al. Multiple adverse childhood experiences and asthma onset in adulthood: Role of adulthood risk factors as mediators [J]. *J Psychosom Res*, 2021, 143(67): 388-421.
- [30] Hallit S, Assi TB, Hallit R, et al. Allergic diseases, smoking, and environmental exposure among university students in Lebanon [J]. *J Asthma*, 2018, 55(1): 35-42.