

# 痰净雾化液排痰作用的临床和实验研究

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**摘要** 为了观察痰净雾化液在小儿呼吸道感染中咽部的排痰作用机理,应用痰净雾化液超声雾化吸入治疗小儿呼吸道疾病103例,临床结果显示,痰净雾化液的排痰作用、痰鸣音减少与对照组相比差异有显著性( $P<0.01$ )。实验研究结果显示,痰净雾化液化痰排痰作用与对照组相比差异有显著性( $P<0.01$ )。动物实验显示痰净雾化液有显著促进气道纤毛运动的作用,与对照组相比差异有显著性或非常显著性( $P<0.05$ 或 $P<0.01$ );电镜显示痰链变短,疏松散在。

**主题词** 呼吸道感染/中药疗法 中药蒸气吸入 @ 痰净雾化液

痰净雾化液(Tan Jing Aerosolize Solution, TJAS)是我院中医科与中药科合作研制的一种用于呼吸道排痰的雾化剂,可辅助治疗各种呼吸道疾病引起的咳痰不畅的痰症。为进一步探讨痰净雾化液排痰效果,我们进行了临床超声雾化吸入观察和实验研究,现将结果报告如下。

## 1 临床观察

1.1 临床资料:按《中西医结合治疗小儿内科常见病》关于支气管肺炎、支气管炎、支气管哮喘、上呼吸道感染等诊断标准<sup>[1]</sup>收治患儿183例,按就诊顺序,随机分为3组,即痰净雾化液(TJAS)治疗组(简称治疗组)103例,痰易净(N-Acetyl cysteine, N-乙酰半胱氨酸, NAC)对照组(痰易净组)50例,生理盐水(NS)对照组(生理盐水组)30例。

治疗组男54例,女49例;年龄45天~15岁,平均5.5岁,其中<1岁20例,1~3岁49例,3~5岁18例,>5岁16例。痰易净组男26例,女24例;年龄2个月~15岁,平均5.8岁;其中<1岁9例,1~3岁20例,3~5岁10例,>5岁11例。生理盐水组男13例,女17例;年龄3个月~14岁,平均5.4岁,其中<1岁7例,1~3岁10例,3~5岁6例,>5岁7例。上述3组性别与年龄经统计学处理差异无显著性( $P>0.05$ ),具可比性。

纳入标准及病种:(1)上、下呼吸道感染(非极期);(2)喉中有痰,或伴无痰干咳、犬吠样、刺激性咳嗽、阵咳、单声咳嗽等;(3)咽充血,或伴不适;(4)

肺部听诊可有痰鸣音病可单独或合并存在。103例中,支气管肺炎90例,支气管炎39例,上呼吸道感染32例,其他22例。

症状和体征:183例中,排粘痰者158例,脓痰25例;痰液能自行排出者32例,难排者151例,痰鸣音157例。

1.2 治疗方法:治疗组用TJAS,痰易净组用NAC雾化液,生理盐水组用生理盐水。TJAS由武汉市儿童医院中药研究室生产(批号:980210),由桔梗、胆南星、鲜竹沥、车前草、蟾酥、紫菀等中药组成,含桔梗皂苷95mg/ml;NAC雾化液由武汉市儿童医院中医科配制(NAC粉剂由湖北劲力生化厂生产,批号:970303,1g/瓶,加注射用水10ml配成10%溶液);生理盐水由武汉市儿童医院制剂室生产(批号:980405)。上述制剂分别置于超声雾化器(DJWC型,天津市电子医疗器械研究所生产)中,每次雾化1~3ml,并记录雾化前及雾化后的15、30分钟的临床病情变化。每雾化1次作为1个疗程,雾化60分钟后判定疗效。对原发疾病按原发病治疗,但在雾化当日均不应用止咳及化痰药物。

1.3 结果:因目前对排痰疗效判断尚无统一标准,本研究以排痰、哮鸣音疗效作为判定标准。显效:有较多痰液排出,咳声较前清爽,咳嗽较治疗前明显减少或消失,呼吸音变清晰或痰鸣音明显减少;有效:有少量痰液排出,咳声较畅,咳嗽较治疗前减少,呼吸音较清晰,或痰鸣音减少;无效:无痰液排出,咳声无改观,呼吸音仍粗糙,或痰鸣音无减少。治疗组103例,显效40例,有效51例,无效12例,总有效率88.35%;痰易净组50例,显效12例,有效24例,无效14例,总有效率72%;生理盐水组30例,有效9例,无效21例,总有效率30%。治疗组疗效优于痰易净组( $P<0.05$ ),两组均优于生理盐水组( $P<0.01$ )。

排痰情况比较:排痰程度分为,脓痰难排3分,脓痰易排2分,粘痰难排2分,粘痰易排1分,无痰0分。治疗组、痰易净组治疗后均明显优于治疗前( $P$ 均<0.01),均明显优于生理盐水组( $P$ 均<0.01)。见附表。

痰鸣音情况比较:肺部痰鸣音程度分为:双肺痰鸣音密集3分;双肺痰鸣音散在或局部闻及2分;双肺痰鸣音偶闻1分;双肺无痰鸣音0分。治疗组、痰易净组痰鸣音治疗后明显减少( $P$ 均<0.01),均明显优于生

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附表 各组治疗前后症状体征评分情况比较( $\bar{x} \pm s$ )

| 组别    | 排 痰 情 况        |                  | 痰 鸣 音         |                  |
|-------|----------------|------------------|---------------|------------------|
|       | 疗 前            | 疗 后              | 疗 前           | 疗 后              |
| 治疗组   | 1.88±0.37(103) | 1.01±0.62(103)*△ | 1.98±0.61(92) | 0.74±0.56(92)*△▲ |
| 痰易净组  | 1.86±0.36(50)  | 0.94±0.59(50)*△  | 1.43±0.63(44) | 0.96±0.69(44)*△  |
| 生理盐水组 | 1.91±0.20(30)  | 1.79±0.45(30)    | 1.67±0.49(21) | 1.53±0.62(21)    |

与本组疗前比较,\* $P<0.01$ ;与生理盐水组比较,△ $P<0.01$ ;与痰易净组比较,▲ $P<0.05$ 。括号内数字为例数

理盐水组( $P$ 均 $<0.01$ ),治疗组明显优于痰易净组( $P<0.05$ )。见附表。

## 2 实验研究

### 2.1 实验材料

2.1.1 药物:痰净雾化液(TJAS)的规格及来源同临床用药;痰易净(NAC)由湖北省劲力化工厂生产(批号:970303);氯化铵由北京红星化工厂生产(批号:9701003);印度墨汁由北京化工厂生产(批号:780322);醋酸氢化泼尼松注射液由仙居制药股份有限公司生产(批号:950313);0.05%异丙肾上腺素由北京制药厂生产(批号:93081519);磷酸组胺、磷酸可待因为国产分析纯。

2.1.2 动物:昆明种小鼠,体重18~22g;Wistar大鼠,体重170~200g,两者均雌雄各半。幼年豚鼠,体重150~200g;鸽,体重200~250g,两者雌雄均有。所有动物均由湖北省医学实验动物中心提供。

2.1.3 仪器:恒压喷雾装置,SO<sub>2</sub>发生器,DJWC电脑超声雾化器,UV-160紫外光光度计,AB204分析天平,秒表。

### 2.2 方法<sup>[2]</sup>与结果

2.2.1 化痰实验:用气管段酚红法。将小鼠随机分为5组,每组10只,第1、2、3组为TJAS低、中、高浓度组,第4组为氯化铵组,每只小鼠灌胃给10%氯化铵0.1ml,30分钟后腹腔注射酚红0.1ml/10g体重;第5组为生理盐水(NS)对照组,灌胃给等体积生理盐水。1、2、3、5组每只小鼠分别注射酚红后,马上用TJAS超声雾化给药2、4、6、2分钟。结果显示各组酚红排泌量分别为1.764±0.4529μg/ml,2.5411±1.0853μg/ml,4.6786±0.6828μg/ml,2.4591±0.7664μg/ml,1.4957±0.3160μg/ml,提示TJAS中浓度组与氯化铵组化痰作用大致相等( $P>0.05$ ),高浓度组明显优于氯化铵组( $P<0.01$ )。

2.2.2 排痰量实验:用毛细管排痰法。取Wistar大白鼠50只,随机分为5组,每组10只。实验用药均为超声雾化吸入,TJAS 3个组 TJAS 剂量分别为6.3mg/kg、12.6mg/kg、25.2mg/kg,NAC组为2.7/kg,NS组为2ml/kg。结果显示,各组排痰量在给药前后分别为2.07±0.80ml、3.72±1.50ml;1.85±0.56ml、5.11±

0.98ml;2.13±1.02ml、5.83±1.12ml;2.02±0.50ml、6.40±2.15ml;1.96±0.78ml、2.04±1.04ml。提示TJAS组和NAC组在用药后能明显增加排痰量( $P<0.01$ 或 $P<0.001$ )。

2.2.3 痰液质量实验:动物及分组、实验方法同前。吸取痰液,比较各实验组痰液粘度。结果显示,各组痰液粘度分别为0.11±0.110mg/μl,0.07±0.056mg/μl,0.02±0.018mg/μl,0.02±0.010mg/μl,0.35±0.120mg/μl。各组与NS组相比差异均有显著性( $P$ 均 $<0.001$ )。显示TJAS能稀释痰液。电镜显示,TJAS能使痰链变短,疏松散在。

2.2.4 气管纤毛运动实验:取家鸽,分组与用药同前。观察气管内壁1分钟内墨汁向前运动的距离。各组结果分别为2.8±0.7cm/min,3.4±1.0cm/min,4.7±1.2cm/min,3.0±1.1cm/min,2.0±0.9cm/min,提示TJAS高、中、低浓度组、NAC组与NS组相比,各组差异均有显著性或非常显著性( $P<0.05$ , $P<0.01$ 或 $P<0.001$ )。显示TJAS有促进气管纤毛运动作用(此实验由湖北中医学院中药研究所完成)。

## 3 讨论

鉴于小儿上、下呼吸道感染而致咽喉部不适、干咳无痰或有痰难咯等表现,笔者以为其病理机制为痰堵气道致肺热灼津,津不上承致干咳无痰或有痰而不易咯出。在TJAS组方中,桔梗开宣肺气,并能化痰畅气,能反射性增加支气管分泌;鲜竹沥清热化痰,可使痰液自气管或支气管排出,能增加气管纤毛运动;车前草亦具祛痰作用,可使呼吸道粘膜分泌明显增加,同时还具清热、镇咳作用;紫菀具消痰、下气、止嗽功效;胆南星具清热化痰,能增加呼吸道的分泌;蟾酥能平喘止咳,消除咽喉部炎性肿胀。以上6味中药共奏化痰、排痰作用,兼清热、抗炎、消肿、止痛之效,无毒副作用,可用于支气管哮喘患儿的辅助治疗。

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## ABSTRACTS FROM ORIGINAL ARTICLES

### **Clinical and Experimental Study on Sputum—Removing Action of Tan Jing Nebulization Liquid**

*Peng Zhaolin, Peng Wenjuan*

103 children of respiratory tract infection were treated with ultrasonic aerosol inhalation of Tan Jing Nebulization Liquid in order to study mechanisms of sputum—removing action in pharyngeal portion. Clinical results indicated that Tang Jing Nebulization Liquid in sputum—removing action and reduction of sputum sound was superior to the control group ( $P < 0.01$ ). Results in the experiment of animal showed that the drug promoted obviously ciliary motion in air passage as compared with the control group ( $P < 0.05$  or  $0.01$ ). Electron microscopy indicated that chain of sputum shortened, loosened and dispersed.

**Authors' address:** Wuhan Municipal Children's Hospital, Hubei Province 430016

**Key words:** respiratory tract infection / TCM therapy, Chinese herb steam inhalation, @ Tan Jing Nebulization Liquid

(Original article on page 216)

### **Comparative Analysis of Therapeutic Effects in Removing Stone in 584 Cases of Cholelithiasis**

*Chen Weimin, Pang Xiaoxia, Zhu Weihua*

581 cases of cholelithiasis were assigned to Western medicine group, Chinese herb group and Combined treatment group. The Western medicine group received oral administration of Trepibutone, Ai Hou Dan Tong Tablet; The Chinese herb group were orally administrated self—formulated prescription Si Jin Pai Shi Decoction and Gan Dan Jie Shi Tablet; The combined treatment group were orally administrated Si Jin Pai Shi Decoction and received treatment with Tui An Yun Jing Instrument. Results showed that the therapeutic effect in the combined treatment group was the best, the all—stone ejection rate, total lithecbole rate and the total effective rate being 16.84%, 49.27%, 84.82%, respectively; in the Chinese herb group was next, the three indexes being 11.29%, 37.10% and 67.7%, respectively; in the Western medicine group was the worst, the three indexes being 2.44%, 7.32% and 13.90%, respectively. There were significantly differences in the all—stone ejection rate ( $P < 0.05$ ), total lithecbole rate ( $P < 0.01$ ) and the total effective rate ( $P < 0.01$ ) among the three groups. It is suggested that the combined treatment is a better method for clinical treatment of middle and small stone with transverse diameter less than 1.0cm at present.

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**Key words:** cholelithiasis/Chinese herb therapy

(Original article on page 218)

### **Approach to Correlativity of Treatment of Amenia Based on Difference of Syndromes with Endometrial Thickness—Clinical Observation of 84 Cases**

*Han Xiaofang, Wang Pujing*

It was found in clinical observation of 84 cases of functional secondary amenia that the patient with endometrial thickness of less than 0.5 cm manifested most as deficiency syndrome and the patient with endometrial thickness of more than 0.5 cm manifested most as excess syndrome. Based on the therapeutic principle "illness of deficiency type should be treated by tonifying method and excess syndrome should be treated with the method of purgation and reduction", a good therapeutic effect was attained. It is indicated that treatment of amenia based on differentiation of syndromes and the endometrial thickness have close correlativity.

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**Key words:** amenia/ Chinese herb therapy, endometrium, medical action, treatment based on differentiation of symptoms and signs

(Original article on page 220)

### **Study on Correlativity of HLA—DQA1 Allelic Gene with Varied TCM Constitution Types in Acute Cerebral Infarction**

*Shen Naiying, Yan Zheng, Jin Yu'an, et al*

Varied TCM constitutions in the patient of acute cerebral infarction were classified by using HLA—DQA1 allelic gene to analyze hereditary susceptibility of constitution types and relation among constitution, syndrome and treatment. PCR—SSP technique was used for classification of Yin—deficiency, Yang—deficiency, Qi—deficiency, phlegm—dampness and blood stasis constitution in 103 cases of acute cerebral infarction and HLA—DQA1 allelic gene was used for gene classification in 99 cases of normal constitution. Results indicated that HLA—DQA1 \* 0501 gene type in Yin—deficiency constitution was significant higher than that of normal constitution ( $P < 0.01$ ); HLA—DQA1 \* 0301 gene type in Qi—deficiency, phlegm—dampness and blood stasis constitution all was higher than normal constitution ( $P < 0.01$ ). It is suggested that HLA—DQA1 \* 0501 gene is correlated with Yin—deficiency in the patient of acute cerebral infarction. Thus, genetical background of relation of constitution with syndrome, and constitution with "treating the same disease with different methods" are explained from view of point of molecular biology.

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**Key words:** cerebral infarction/ genetics

(Original article on page 237)