

Original Article

Relationship between chronic tonsillitis and Henoch-Schonlein purpura

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Abstract: The aim of this study was to explore the relationship between children's chronic tonsillitis and Henoch-Schonlein purpura (HSP). We randomly selected 56 cases of HSP children with chronic tonsillitis during December 2009 to December 2012, 26 cases for surgery group and 30 cases for non-surgery. The duration of abdominal pain and rash, 24 hours urine protein quantity, urine red blood cell count, titre of anti streptolysin O (ASO) and complement C3 (C3) were compared and analyzed with statistical method. Compared with the non-surgery group, the duration of abdominal pain and rash, overcast days of urine protein and occult blood in the surgery group were improved significantly ($P < 0.05$). 24 hours urine protein quantity and urine red blood cell count of the surgery group were improved significantly after surgery ($P < 0.01$). Chronic tonsillitis was one of the important factors leading to recurrent rash and inducing Henoch-Schonlein purpura nephritis. Tonsillectomy was an alternative mean to treat HSP children with chronic tonsillitis.

Keywords: Henoch-Schonlein purpura, chronic tonsillitis, rash, 24-h urine protein, tonsillectomy

Introduction

Henoch-Schonlein purpura (HSP) is a common capillary allergic disease in children, with self-limited systemic small vasculitis syndrome. It is mediated by IgA immune complex [1], and is manifested as characteristic rash, often accompanied by joint, alimentary tract, kidney and other multi-system organ damages, and its etiology and pathogenesis have not yet been fully elucidated [2, 3]. Severe HSP can cause intestinal perforation, intussusception, kidney damage and other organ damages, and even endanger the life [4]. The prognosis of HSP is highly correlated with children's age and degree of renal involvement [5, 6]. The occurrence rate of recurrent rash is up to the third, and the renal involvement is 30%-68.7% [3, 5, 7, 8]. However, the treatment and effects of recurrent rash and kidney involvement have not been identified in clinic [9]. It is believed that, Henoch-Schonlein purpura nephritis (HSPN) and IgA nephropathy are the same disease with different manifestations [10], while IgA nephropathy can be relieved or cured through tonsillectomy [11]. Whether HSPN and recurrent rash are associated with the chronic tonsillitis, and whether the tonsillectomy can relieve the clinical symptoms or cure them need to be

confirmed. Previous studies [12, 13] report that, a positive control of oral and otolaryngology infections, as well as tonsil and adenoidectomy, are effective for recurrent rash and HSPN. And other studies [14, 15] show that, in HSPN patients the hematuria and proteinuria disappear after adenoidectomy. This suggests that there may be certain relation between tonsil and HSP. In this study, in order to explore the relationship between Chronic tonsillitis and HSP, and learn more about whether it was meaningful or not to treat HSP with tonsillectomy, we jointed otolaryngology department, randomly selected recurrent HSP rash children with Chronic tonsillitis as well as HSPN who were not easy to treat during December 2009 to December 2012, and carried out relevant researches.

Materials and methods

General data

56 cases of HSP children with chronic tonsillitis were randomly selected during December 2009 to December 2012. 32 males and 24 females aged 3 to 12 years old. Among them, 26 cases as surgery group that underwent tonsillectomy and 30 cases as non-surgery group. This study

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Table 1. Comparison of two groups' general material ($\bar{x} \pm s$, n = 56)

Groups	Cases	Sex/cases		Age (y)	Weight (kg)
		Male	Female		
Surgery	26	14	12	7.2 ± 1.3	27.5 ± 5.4
Non-surgery	30	18	12	6.4 ± 2.2	26.7 ± 6.2
P value		> 0.05		> 0.05	> 0.05

was conducted in accordance with the declaration of Helsinki. This study was conducted with approval from the Ethics Committee of Laiwu People's Hospital. Written informed consent was obtained from all participants' guardians. Gender constituent ratio between the two groups of children were compared using chi-square test fourfold table data; the age groups of children, the weight difference between using two sample t-test. Two groups were comparable with no statistically significant difference in sex, age and body weight ($P > 0.05$, **Table 1**).

Inclusion criteria

All the diagnosis of HSP and Chronic tonsillitis were in accordance with related criteria: Clinical Practice Guidelines-ENT Volume (edited by the Chinese Medical Association, 2009, People's Health Publishing House) and Zhu Fu Tang Practical Pediatrics (Seventh version) (HSP: ① Palpable purpura; ② Less than 20 years old; ③ Acute abdominal pain; ④ Biopsy revealed neutrophil infiltration around the small veins and small arteries; conformed to two or above could be diagnosed. Chronic Tonsillitis: ① Recurrent sore throat and fever history; ② Chronic congestion of palatine tonsils and lingual arch with irregular surface, crypt mouth may have retention matter.

Exclusion criteria

Children who were in line with the above diagnosis and excluded congenital malformations, severe infection, cancer, blood diseases, metabolic diseases and immune deficiency diseases.

Drugs and surgery

Children were randomly divided into two groups (surgery group and non-surgery group) and then compared with each other.

Two groups were given penicillin to fight infection, cimetidine, Vitc, loratadine and ferulate to

inhibit gastric acid, improve blood circulation and antagonize histamine. HSPN children's diagnosis and treatment were according to Chinese Medical sciences Branch of nephrology group in 2009. Based on those treatments, the surgery group was given tonsillectomy and continued those drug treatments after surgery.

Laboratory tests

To detect and compare the duration of abdominal pain and rash, overcast days of urine protein and occult blood, titre of ASO and C3 (Reagent product standard: YZB/USA 3338-40-2004, Shanghai Pudong Beckman Coulter in China. Instrument: AU5800 automatic biochemical analyzer of Beckman Coulter in American). Using nephelometry to detect and more than or equal to 200U as positive. Children in two groups were given pharyngeal secretion bacterial culture and mycoplasma swab culture. To detect and compare 24 hours urine protein quantity and urine red blood cell count of the surgery group before and after surgery.

Statistical analysis

All data were input into SPSS 15.0 statistical analysis software, the measurement data as expressed as mean ± standard deviation. The comparison of gender constituent ratio between the two groups was used chi-square test of fourfold table; the comparison of age, body weight and clinical examination results used the t test of 2-sample mean difference; the comparison of preoperative and postoperative 24-h urine protein quantitation and urine red blood cell counting used t test towards the same patient, with $P < 0.05$ considered as statistically significant difference.

Results

Pharyngeal secretion bacterial culture and mycoplasma swab culture

Pharyngeal swab culture of two groups prompted that a beta-hemolytic streptococcus was the main pathogenic bacteria, also had streptococcus pneumoniae, staphylococcus aureus, haemophilus influenzae and mycoplasma. It suggested that HSP associated with Chronic Tonsillitis was mainly with streptococcal infection (**Table 2**).

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Table 2. Pharyngeal secretion bacterial culture and mycoplasma swab culture results of two groups

Groups	Cases	A beta-hemolytic streptococcus	Streptococcus pneumoniae	Staphylococcus aureus	Haemophilus influenzae	Mycoplasma
Surgery	26	12 (46.2%)	7 (26.9%)	4 (15.4%)	2 (7.7%)	1 (3.8%)
Non-surgery	30	15 (50%)	6 (20%)	5 (16.7%)	1 (3.3%)	2 (6.7%)

Table 3. Comparison of two groups' clinical test results ($\bar{x} \pm s$)

Groups	Cases	Duration of rash (day)	Overcast days of urine protein (day)	Overcast days of urine occult blood (day)	Duration of abdominal pain (day)	ASO (IU/mL)	C3 (g/L)
Surgery	26	10.58 ± 4.22	12.3 ± 4.1	10.1 ± 3.3	6.49 ± 2.45	450 ± 75	0.9 ± 0.3
Non-surgery	30	16.70 ± 9.68	16.5 ± 5.6	12.7 ± 4.9	9.20 ± 2.21	480 ± 70	1.03 ± 0.25
t		2.99	3.16	2.3	4.37	1.54	1.86
P		< 0.01	< 0.01	< 0.05	< 0.01	> 0.05	> 0.05

Table 4. Comparison of 24 h urine protein quantity and urine red blood cell count before and after surgery ($\bar{x} \pm s$)

Groups	24 h urine protein quantity (g/24 h)	Urine red blood cell count (p/μL)
Before surgery	1.61 ± 1.22	56.61 ± 12.57
After surgery	0.72 ± 0.28	14.95 ± 4.76
t	3.56	15.49
P value	< 0.01	< 0.01

Analysis of clinical correlation test results

Clinical symptoms and test results of the two groups were compared, and four with significant difference ($P < 0.05$), including the duration of abdominal pain and rash, overcast days of urine protein and occult blood (**Table 3**); 24 hours urine protein quantity and urine red blood cell count after surgery were significantly improved with significant difference ($P < 0.01$) (**Table 4**). It suggested that HSP children with Chronic Tonsillitis were significantly improved and even healed after tonsillectomy.

Discussion

Results of this study found that compared with the non-surgery group, the duration of abdominal pain and rash, overcast days of urine protein and occult blood in the surgery group were significantly improved ($P < 0.01$). 24 hours urine protein quantity and urine red blood cell count of the surgery group were improved significantly after surgery, with significant difference ($P < 0.01$). Compared with non-surgery group, the hospitalization time of the surgery group was significantly shorter. This confirmed that for children with HSP complicated with chronic ton-

sillitis, the clinical symptoms are effectively alleviated after tonsillectomy, suggesting that there was certain relation between HSP and chronic tonsillitis, and resection of proliferated tonsil was one of effective ways to treat this disease. Akpınar et al. [16] found that the rash, urine protein quantity, abdominal pain and other symptoms of HSP children were significantly improved after adenoids and tonsillectomy. Iwamoto et al. [17] and Iwazu et al. [14] also reported that the rash, urine protein quantity, urine red blood cell count and other symptoms Chronic Tonsillitis with HSP children were significantly improved after tonsillectomy. Previous studies showed that a positive control of oral and otolaryngology infections, as well as tonsil and adenoidectomy are effective for recurrent rash and HSPN [12, 13, 15], which was consistent with the results of this study. Chen et al. [18] reported that mononuclear cells of tonsil gland could cause abnormal immune response in the infected state, causing the secretion of the cell and involved in the pathogenesis of IgA nephropathy, HSPN had similar pathological basis and with IgA nephropathy, which may be one of the mechanisms that causing HSPN. Tonsils was the immune intermediary of oral and sinus exogenous infection, only through that it may produce a strong immune response, but Chronic Tonsillitis infection was difficult to remove, which led to repeated invasion of pathogens and recurrent illness. Children's symptoms improved because immune response pathway and the source of infection may be cut off after tonsillectomy.

In this study children in two groups were mainly with streptococcal infection, then streptococcus pneumoniae, staphylococcus aureus, hae-

mophilus influenzae and mycoplasma infection, which were consistent with the previous studies [3, 4, 19-21]. It was found that streptococcus, staphylococcus and mycoplasma infection were closely linked with the incidence of HSP, and streptococcal infection may be an important factor in inducing HSP and leading to HSPN [22-25], which suggested that streptococcal infection detection had important reference value for clinical diagnosis and prognosis. Mechanism of streptococcus inducing HSP was unclear. The infection might have multiple system clinical manifestations, and immune response played a major role [26]. Luo et al. [27] and He et al. [28] found that there existed imbalance of Th1/Th2 on HSP patients, and serum concentration of varieties of cytokines, such as IL-4 and IFN- γ , increased significantly. Huang et al. [29] found that stimulation of streptococcus could cause imbalance of Th1/Th2, promote producing IL-4, IFN- γ and other cytokines, result in immune response which was mediated by IgA, form immune complex, cause an autoimmune response resulting in tissue damage, and then may lead to HSP. IgA1 which was isolated from HSP patients could induce apoptosis of vascular endothelial may suggest this possibility indirectly [30]. At the same time, humoral factor abnormalities participation and individual susceptibility genes may be involved [19].

This study demonstrated that there was a close link between HSP and Chronic Tonsillitis. It was feasible through tonsillectomy and associated with other conventional treatment, broaden the therapeutic approach of Chronic Tonsillitis with HSP children, as well as the children with recurrent rash and urine protein was not easy to turn negative. The clinical cases in this study are still limited, and they are all non-selective random cases. This is the limitation of this study. The multi-center and large sample-size experiment is needed in future studies.

Disclosure of conflict of interest

None.

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