

Study on the therapeutic effect of cupping combined with antiviral therapy in children with herpetic angina and its impact on inflammatory factors

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CITATION

Author Name. (2025). Article title. Journal of Infrastructure, Policy and Development. 9(x): X.
<https://doi.org/10.24294/jipdxxxx>

ARTICLE INFO

Received: Date Month Year

Revised:

Accepted: Date Month Year

Available online: Date Month Year

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Abstract: Objective: To explore the therapeutic effect of cupping combined with antiviral therapy in children with herpetic angina and its impact on inflammatory factors. Method: A total of 112 pediatric patients with herpetic angina from June 2020 to May 2022 were selected as the study subjects, and randomly divided into two groups with 56 patients in each group using a number table method. The control group received antiviral therapy, while the observation group received cupping therapy. After 2 weeks of treatment, the patient's efficacy was evaluated, and a 6-month outpatient follow-up was completed. The time of symptom disappearance, visual analogue pain (VAS) score, myocardial enzyme spectrum, inflammatory factors, treatment safety, and recurrence rate were compared between the two groups. Result: After 2 weeks of intervention, the levels of VAS and CK-MB in both groups were reduced; The disappearance time, VAS score, and CK-MB of herpes, fever, and pharyngodynia symptoms in the observation group were lower than those in the control group ($P<0.05$); After 2 weeks of intervention, inflammatory factors were reduced in both groups; Observation group IL-1 β , CSF-1, TNF- α , The CRP level was lower than that of the control group ($P<0.05$); There was no statistical difference in the incidence of fatigue, myalgia, nasal burning sensation, and dizziness and nausea between the two groups during the treatment period ($P>0.05$); The recurrence rate in the observation group was lower than that in the control group at 3 and 6 months of follow-up after 4 weeks of treatment ($P<0.05$). Conclusion: Cupping combined with antiviral therapy can shorten the time for symptoms to disappear in children with herpetic angina, help alleviate pain and myocardial damage, and lower the level of inflammatory factors. Moreover, this treatment plan does not increase the incidence of adverse reactions, and the long-term recurrence rate of patients at 3 to 6 months is low, which is worth promoting and applying.

Keywords: Cupping; Anti virus; Herpetic angina in children; Therapeutic effect; Inflammatory factors; Myocardial enzyme spectrum; Security

Herpangina is A respiratory tract infection caused by enterovirus infections such as Coxsackievirus A and enterovirus 71^[1].The results of epidemiological investigations indicate that^[2],Herpangina can occur throughout the year, has a relatively high prevalence rate, and is sporadic or prevalent. The peak incidence among children is in spring and summer. After the onset of the disease, the clin-

ical manifestations of the child patients are mostly herpes in the pharynx, fever and sore throat, etc. Moreover, the disease is highly contagious, which increases the difficulty of clinical treatment^[3-4]. Antiviral therapy is a commonly used treatment method for children with herpangina. Although it can improve the symptoms of children, enhance humoral immunity and cellular immunity, most children can benefit from it^[5]. However, single antiviral treatment often fails to achieve good therapeutic effects, resulting in a poor long-term prognosis for children. In traditional Chinese medicine, herpangina in children is classified under diseases such as "common cold" and "mouth ulcers". As the "epidemic qi" of herpes enters the lungs, stomach, heart and other organs through the mouth and nose, it invades and interferes with the pathogenic qi to ascend along the organs and reach the pharynx area, causing the child's meridians to be blocked, qi and blood to be congested, and the accumulation of heat to the point of blood stasis and flesh decay, thereby resulting in corresponding clinical symptoms^[6]. Cupping, on the other hand, can interact with acupoints, stimulate certain parts of the body, and help the child's internal organs and meridians regulate the functions of qi and blood, thereby achieving the goal of treating diseases^[7]. This study mainly explores the effect of cupping combined with antiviral therapy on inflammatory factors in children with herpangina. The report is as follows.

1. Materials and Methods

1.1 General Information

From June 2020 to May 2022, 112 children with herpangina were divided into two groups. There were 56 cases in the control group, including 31 males and 25 females, aged (3-7) years, with an average age of (5.28 ± 1.23) years. The disease course was (1-10) days, with an average of (4.62 ± 0.93) days. Body weight: (12-24) kg, with an average of (18.42 ± 2.61) kg; The main sites of herpes: 24 cases of palatopharyngeal arch, 26 cases of uvula, and 6 cases of soft palate. There were 56 cases in the observation group, including 29 males and 27 females, aged (3-9) years, with an average age of (5.26 ± 1.21) years. The disease course was (1-11) days, with an average of (4.63 ± 0.99) days. Body weight: (11-25) kg, with an average of (18.51 ± 2.68) kg; The main sites of herpes: 22 cases of palatopharyngeal arch, 27 cases of uvula, and 7 cases of soft palate.

1.2 Inclusion and exclusion criteria

Inclusion criteria: (1) All were clinically confirmed cases of herpangina in children^[8]; (2) The condition is stable, the patient is conscious and capable of communication and interaction. (3) None of them have indications for cupping or antiviral treatment, and all the children can tolerate it. Exclusion criteria: (1) Co-infection with bacteria or lower respiratory tract infection; (2) Those who have taken anti-winning lawsuits, immunosuppressants or hormones within the past week; (3) Those with other respiratory diseases such as acute bronchopneumonia.

1.3 Method

Control group: Antiviral treatment was adopted. All the children patients were treated with methods such as reducing fever, physical cooling, antiviral treatment, maintaining oral hygiene, nutritional support intervention, vitamin B6, and vitamin C. Basic intervention treatments such as maintaining water and electrolyte balance. Each time, take 1-2μg/kg of interference α1b injection (Sinovac Biotech Co., LTD., National Drug Approval No. s10960058, specification: 10μg per vial) and mix it with 2mL of 0.9% sodium chloride injection for nebulized inhalation treatment. Before medication, guide the child to clean their mouth twice a day for 2 consecutive weeks ^[9].

Observation group: Combined cupping therapy. Cupping therapy also includes Feishu, Pishu, and Weishu, with the addition of moving cupping. Each session should be controlled for 5 minutes and should not exceed 10 minutes at most to promote the treatment of clearing heat, dispelling wind and dampness for the child. The effect of the patient should be evaluated after 2 weeks of treatment.

1.4 Observation indicators

Symptom disappearance time, Visual Analogue scale (VAS) score and myocardial enzyme spectrum. Record the disappearance time of symptoms such as herpes, fever and sore throat in the pharynx of the two groups; The pain of the patients was evaluated by the VAS scale before the intervention and 2 weeks after the intervention, with a total score of 10 points. The higher the score, the more severe the pain ^[10]; The level of creatine kinase isoenzyme (CK-MB) was determined by using an automatic biochemical analyzer ^[11]; (2) Inflammatory factors. The levels of interleukin-1 β (IL-1β), colony-stimulating factor 1 (CSF-1) and tumor necrosis factor -α (TNF-α) were determined by enzyme-linked immunosorbent assay ^[12]; The level of C-reactive protein (CRP) was determined by immunoturbidimetry ^[13]; (3) Therapeutic safety. Record the incidences of fatigue, myalgia, nasal burning sensation, dizziness and nausea during the treatment period in both groups; After two weeks of treatment, a 6-month follow-up was completed, and the recurrence rates at 3 and 6 months of follow-up were statistically analyzed. The level of C-reactive protein (CRP) was determined by immunoturbidimetry ^[13]; (3) Therapeutic safety. Record the incidences of fatigue, myalgia, nasal burning sensation, dizziness and nausea during the treatment period in both groups; After two weeks of treatment, a 6-month follow-up was completed, and the recurrence rates at 3 and 6 months of follow-up were statistically analyzed.

1.5 Statistical analysis

The data were processed by SPSS26.0 software. The count data were analyzed by χ² test and expressed as n (%), while the measurement data were analyzed by t test and expressed as (). A P value <0.05 indicated a statistically significant difference.

2 Result

2.1 Comparison of symptom disappearance, VAS and CK-MB levels between the two groups

There was no statistical difference in the levels of VAS and CK-MB between the two groups before the intervention ($P>0.05$). After two weeks of intervention in both groups, the levels of VAS and CK-MB were reduced. The disappearance time of symptoms such as herpes, fever and sore throat in the pharynx, VAS score and CK-MB in the observation group were lower than those in the control group ($P<0.05$), as shown in Table 1.

Table 1. Comparison of symptom Disappearance, VAS and CK-MB levels between the Two Groups ($\bar{x} \pm s$)

Group	Time point	Herpes in the pharynx(d)	fever(d)	Sore throat(d)	VAS score (points)	CK-MB(U/L)
Observation Group(n=56)	Before intervention	3.41±0.63#	3.01±0.39#	4.12±0.51#	4.19±0.84	33.29±3.15
	Two weeks after the treatment				0.86±0.13##*	18.52±2.31#*
Control group(n=56)	Before intervention	5.79±0.71	4.69±0.52	5.79±0.63	4.21±0.86	33.31±3.16
	Two weeks after the treatment				1.79±0.45*	23.69±3.01*

Compared with the control group, # $P<0.05$; Compared with before the intervention, * $P<0.05$

2.2 Comparison of inflammatory factors between the two groups

There was no statistical difference in inflammatory factors between the two groups before the intervention ($P>0.05$). After 2 weeks of intervention, the levels of IL-1 β , CSF-1, TNF- α and CRP in the observation group were lower than those in the control group ($P<0.05$), as shown in Table 2.

Table 2. Comparison of Inflammatory Factors between the Two Groups ($\bar{x} \pm s$)

Group	Time point	IL-1 β (ng/L)	CSF-1(ng/L)	TNF- α (ng/L)	CRP(mg/L)
Observation Group(n=56)	Before intervention	81.68±8.39	59.78±5.45	124.19±21.56	15.79±2.52
	Two weeks after the treatment	31.53±4.26##*	22.15±3.19##*	53.27±5.62##*	5.12±0.84##*
Control group(n=56)	Before intervention	81.70±8.41	59.97±5.49	124.73±21.62	15.81±2.64
	Two weeks after the treatment	50.69±6.69*	37.49±4.52*	89.74±6.69*	9.78±1.53*

Compared with the control group, # $P<0.05$; Compared with before the intervention, * $P<0.05$

2.3 Comparison of safety and recurrence rates between the two groups

There was no statistical difference in the incidence of adverse reactions between the two groups during the intervention process ($P>0.05$). The recurrence rate of the observation group was lower than that of the control group at 3 months and 6 months after 4 weeks of treatment ($P<0.05$), as shown in Table 3.

Table 3. Comparison of safety and recurrence rates between the two groups[n(%)]

Group	Number of cases	Safety				Recurrence rate	
		Myalgia and weakness	Nasal burning sensation	Dizziness and nausea	Incidence rate	Three months	Six months
Observation Group	56	1(1.79)	1(1.79)	2(3.57)	4(7.14)	0(0.00)	1(1.79)
Control group	56	1(1.79)	0(0.00)	2(3.57)	3(5.36)	1(1.79)	7(12.50)
χ^2	/	/	/	/	0.154	1.009	4.846
P	/	/	/	/	0.696	0.315	0.028

3 Discussion

Herpangina is an acute upper respiratory tract infectious disease caused by Coxsackievirus infection, which is highly contagious. Its main transmission routes are the respiratory tract and the fecal-oral cavity. It often shows regional sporadic or epidemic outbreaks, affecting the health and life of children [14-15]. Zhou Limin's research shows ^[16] that herpangina in children has the characteristics of rapid onset and quick progression of the disease. If not effectively treated, it will cause respiratory and pulmonary infections and affect the normal function of the child's myocardium. In this study, after 2 weeks of intervention, the disappearance time of symptoms such as herpes, fever and sore throat in the pharynx, VAS score and CK-MB in the observation group were lower than those in the control group ($P < 0.05$). From the results of this study, it can be seen that cupping combined with antiviral therapy can shorten the disappearance time of symptoms in children with herpangina, relieve the pain of the children, improve the level of myocardial enzyme spectrum and facilitate the recovery of the children. Analysis of the cause: Antiviral therapy is the preferred treatment option for children with herpangina. With the help of antiviral drugs, it is helpful to enhance the humoral immunity and cellular immunity of patients. Meanwhile, during the treatment process, the combination of traditional Chinese medicine cupping therapy can exert the synergistic effect of the two treatment plans, consolidate the antiviral treatment effect, help patients clear the infected virus in a short time, and continue to exert its effect ^[17]. In this study, there was no statistical difference in the incidence of fatigue and myalgia, nasal burning sensation, dizziness and nausea during the treatment period between the two groups ($P > 0.05$). The recurrence rate of the observation group was lower than that of the control group at 3 months and 6 months after 4 weeks of treatment ($P < 0.05$). From the results of this study, it can be seen that the combination of cupping and antiviral treatment for children with herpangina is relatively safe and can reduce the long-term recurrence rate.

Although antiviral treatment can rapidly improve the condition of children with herpangina, single antiviral therapy is difficult to eliminate the infected virus in a short period of time. It often needs to be combined with traditional Chinese medicine intervention to consolidate the therapeutic effect ^[18]. The theory and practice of traditional Chinese medicine have undergone years of development.

In traditional Chinese medicine, herpangina in children is classified under the categories of "pediatric aphthous ulcers", "oral erosion" and "laryngeal arthralgia". The onset of this disease is mainly due to the invasion of wind-heat pathogenic toxins from the outside, which combats the qi and blood. Coupled with the insufficiency of the body's vital energy, the unstable exterior defense, and Yin deficiency with hyperactivity of fire, it further invades the lung and defense, and ascends along the meridians, with wind-heat pathogenic toxins attacking the throat and causing the disease ^[19]. Therefore, in traditional Chinese medicine, the treatment of herpangina in children should mainly focus on nourishing Yin, clearing the lungs and relieving sore throat. In this study, children with herpangina were treated with cupping in addition to antiviral therapy, which could promote blood flow, exert warming and regulatory effects, and also have the functions of relaxing meridians, promoting blood circulation and relieving pain. This enabled the blocked meridians to be unblocked, and the circulation of qi and blood achieved a pain-relieving effect, which was helpful in reducing the levels of inflammatory factors ^[20]. In this study, the inflammatory factors in the observation group were lower than those in the control group after 2 weeks of intervention ($P < 0.05$). From the results of this study, it can be seen that cupping combined with antiviral therapy can reduce the levels of inflammatory factors in children with herpangina. Analysis of the reason: The combination of cupping and antiviral therapy can activate the body's immunity and regulate the activity of immune cells, thereby playing a role in reducing inflammatory responses.

In conclusion, cupping combined with antiviral therapy can shorten the time for symptoms to disappear in children with herpangina, help alleviate their pain and myocardial damage, and reduce the levels of inflammatory factors. Moreover, this treatment plan does not increase the incidence of adverse reactions, and the long-term recurrence rates at 3 and 6 months are relatively low. It is worthy of promotion and application.

Fund Project:

Research Project of Traditional Chinese Medicine Category of Hebei Provincial Administration of Traditional Chinese Medicine (Project No. : 2019448)

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