ORIGINAL RESEARCH ARTICLE

Effectiveness of transurethral resection combined with sapylin for bladder perfusion in glandular cystitis: A randomized controlled trial

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Abstract

This study explored the impact of transurethral resection plus sapylin for bladder perfusion in treating glandular cystitis. One hundred and twenty-eight cases of glandular cystitis who accepted therapy in Renmin Hospital of Wuhan University, Wuhan, China from September 2018 to September 2022 were chosen and randomly separated into a control group (CG, n=64) and a research group (RG, n=64). The CG received transurethral resection. In contrast, the RG received sapylin infusion chemotherapy in addition to transurethral resection. The clinical efficacy, urination function, levels of inflammatory factors, quality of life along with adverse reactions in the two groups was compared. Relative to the CG, the RG showed higher total treatment effectiveness rate, better improvements of urination function and inflammation, higher quality of life scores, and lower occurrence of adverse reactions. We conclude that transurethral resection combined with sapylin for bladder perfusion has higher effectiveness in treatment of glandular cystitis when compared to transurethral resection alone. *(Afr J Reprod Health 2025; 29 [5s]: 27-34).*

Keywords: Glandular cystitis, transurethral resection, sapylin for bladder perfusion, inflammation, quality of life

Résumé

Cette étude a exploré l'impact de la résection transurétrale associée à la sapyline pour la perfusion vésicale dans le traitement de la cystite glandulaire. Cent vingt-huit cas de cystite glandulaire, traités à l'hôpital Renmin de l'université de Wuhan, en Chine, entre septembre 2018 et septembre 2022, ont été sélectionnés et répartis aléatoirement en un groupe témoin (GC, n = 64) et un groupe de recherche (RG, n = 64). Le GC a bénéficié d'une résection transurétrale. À l'inverse, le RG a reçu une chimiothérapie par perfusion de sapyline en plus de la résection transurétrale. L'efficacité clinique, la fonction urinaire, les niveaux de facteurs inflammatoires, la qualité de vie et les effets indésirables des deux groupes ont été comparés. Par rapport au GC, le RG a montré un taux d'efficacité thérapeutique global plus élevé, une meilleure amélioration de la fonction urinaire et de l'inflammation, des scores de qualité de vie plus élevés et une incidence plus faible d'effets indésirables. Nous concluons que la résection transurétrale associée à la sapyline pour la perfusion vésicale est plus efficace dans le traitement de la cystite glandulaire que la résection transurétrale seule. *(Afr J Reprod Health 2025; 29 [5s]: 27-34).*

Mots-clés: Cystite glandulaire, résection transurétrale, sapyline pour la perfusion vésicale, inflammation, qualité de vie

Introduction

Glandular cystitis is the hyperglandular degeneration of the bladder mucosa caused by urinary system infection, obstruction, calculi, and other chronic bladder irritants, with multiple sites being trigone, neck of the bladder, and below the inner orifice of the urethra.[1] Available evidence indicates that the ?global incidence of glandular cystitis is 0.1%-1.9%, but in recent years, there was an upward trend.[2] Patients with glandular cystitis often present with frequent urination, urinary urgency, painful urination, hematuria, and lower abdominal pain. Cystoscopy and biopsy are required to confirm the diagnosis.[3] The disease recurs easily, causing a lot of discomfort in the lives of patients.[4] Therefore, searching effective treatment approaches has become a hot spot of clinical attention.

In clinical practice, surgical treatment is mainly used, among which transurethral resection is commonly used.[5] Transurethral resection can effectively resect the diseased tissue and reconstitute the surrounding normal bladder mucosa with little surgical trauma, but there is still a risk of recurrence after surgery.[6] Studies have shown that the combined use of drug for bladder perfusion therapy based on transurethral resection

can obtain better curative effect and effectively improve the health level of patients.[7] Sapylin (also known as Ok-432) is A biological response regulator obtained from human Group A hemolytic streptococcus Su strain (low virulent variant strain) after penicillin inactivation treatment.[8] It is a non-traditional chemotherapy-infused drug for bladder irrigation, and has obvious immunological activity, which can prevent the recurrence of glandular cystitis by stimulating cellular and humoral immunity of the body.[9]

The objective of this study was to investigate the effectiveness of transurethral resection combined with sapylin for bladder perfusion in treating glandular cystitis.

Method

Materials

One hundred and twenty-eight cases of glandular cystitis accepted therapy in Renmin Hospital of Wuhan University, Wuhan, China from September 2018 to September 2022 were chosen and randomly separated in to control group (CG, n=64) and research group (RG, n=64). The CG contained 30 males and 34 females, ranging in age from 23 to 65 years old, with a mean age of (44.1±4.6) years old. The RG comprised 32 males and 32 females, ranging in age from 22 to 64 years old, with a mean age of (44.3±4.6) years old. The baseline data of sex and age in both groups were compared, and the difference was not statistically significant (P>0.05). The inclusion criteria were: (1) Glandular cystitis confirmed by pathological biopsy and cystoscopy. (2) Family members and the patients agreeing to participate in the study.

The exclusion criteria were: (1) patients accepting other treatments prior to admission; and (2) comorbidity with severe neurological disease.

Methods

Patients in the CG received transurethral resection: The patients were given continuous epidural anesthesia, disinfected, and laid with sterile towels. The F22 electric incision scope was placed into the patient's bladder to fill the bladder with lavage solution. The specific situation in the bladder was observed to identify the lesions. The diseased tissue was removed under the guidance of the endoscope, and the surrounding normal tissue was reserved for about 1.5 cm, while the depth of excisions was consistent with the superficial muscle layer. Electrocoagulation and hemostasis were performed, normal saline was instilled, urethral tube was connected, and the patient's bladder was rinsed. Antibiotics including broad-spectrum penicillin, third-generation cephalosporins, aminoglycosides or fluoroquinolones were routinely applied for five days after surgery to avoid infection. Extubation was performed after urine was cleared.

Patients in the RG received sapylin infusion chemotherapy in addition to transurethral resection: One week after the completion of transurethral resection, sapylin (Sinopharm Luya (Shandong) Pharmaceutical Co., Ltd., Sinopharm S19980002, specification: 5 KE) was mixed with 30 ml of 0.9% sodium chloride injection with 5 KE of sapylin to perform bladder instillation on the patients. Skin test was often performed on the patients before using sapylin perfusion, and the medication was given to patients without abnormalities. The drug retention time was about 1 h. The patient's position was changed once every 15 minutes, in accordance with the sequence of supine position, left supine position, prone position and right supine position, after which, the patient was allowed to urinate. Infusion chemotherapy was carried out once a week with continuous infusion chemotherapy eight times. This was later changed to a monthly infusion of chemotherapy, with 10 consecutive chemotherapy transfusions.

After therapy, all patients accepted cystoscopy every 3 months, blood routine and liver and kidney function every 3 months, and were followed up for 1 year.

Treatment evaluation

The clinical efficacy was evaluated three months following operation. Cure: The clinical manifestations disappeared completely following treatment, and the cystoscopy manifested that the bladder mucosa was normal. Improvement: The clinical manifestations were significantly relieved after treatment, and cystoscopy uncovered that the

bladder mucosa was basically normal or a little lesion mucosa was scattered. Ineffective: After treatment, the clinical manifestations did not change significantly or became worse than before treatment. Cystoscope review showed that the bladder mucosa was still focus-like, and pathological examination revealed the presence of Brunn nest. The total response rate consists of the sum of the cure rate and the improvement rate.

Observed indices

(1) Clinical effects in the two groups were compared.
(2) The urination function in the two groups were detected and compared before surgery and at 3 months after surgery.
(3) Serum levels of interleukin-2 (IL-2), interferon γ (IFN-γ) as well as tumor necrosis factor α (TNF-α) were measured before treatment and at 7 days after surgery. On the day of examination, 3 mL of fasting venous blood was extracted from the patient. Then, the upper serum was taken at a rotating speed of 3500 r/min and a centrifugal radius of 3 cm for 10 min. The upper serum was divided into 1 mL frozen tube and stored in a -4 ℃ refrigerator for testing. Serum levels of IL-2, IFN-γ, along with TNF-α were tested by enzyme-linked immunosorbent assay (ELISA).
(4) The quality-of-life scale was implemented to score patients' quality of life in both groups. Higher score meant higher quality of life.
(5) Adverse reactions included bladder irritation symptoms, myelosuppression, renal impairment, rash, and urethral stricture were recorded in both groups.

Statistical analysis

SPSS 19.0 software was implemented for analyzing data. The measurement data were exhibited as mean ± standard deviation, followed by comparison using t test. The statistical data were exhibited as percentage (%), and analyzed using χ^2 test. $P<0.05$ was statistically significant.

Ethical clearance

This study was consistent with the ethical standards of the 1964 Declaration of Helsinki and its later amendments, and was approved by the Ethics Committee of Renmin Hospital of Wuhan University.

Results

Clinical effects in both groups

The total effective rate of the CG was 78.1%, and that of the RG was 96.9%. Relative to the CG, the RG presented better total effective rate ($P<0.05$, Table 1).

Postoperative urination function changes in both groups

As shown in Figure 1, there no differences were seen in the frequency of urination, residual urine volume and maximum urine flow rate between both groups prior to treatment ($P>0.05$). Three months postoperatively, the number of urination and residual urine volume declined, and the maximum urine flow rate was raised ($P<0.05$). Relative to the CG the frequency and residual urine volume of the RG declined more and the maximum urine flow rate was more elevated 3 months after surgery ($P<0.05$).

Levels of inflammatory factors in both groups

Prior to treatment, no difference was seen in IL-2, IFN-γ along with TNF-α between both groups ($P > 0.05$). After treatment, the above indexes in both groups were improved, but relative to the CG, the improvements of inflammatory markers in the RG were significantly higher ($P < 0.05$), as exhibited in Figure 2.

Table 1: Clinical effects in both groups

Groups	N	Cure	Improvement	Ineffective	Total effective rate (%)
Control group	64	34 (53.1)	16 (25.0)	14 (21.9)	50 (78.1)
Research group	64	52 (81.3)	10 (15.6)	2 (3.1)	62 (96.9)
χ^2		10.3			
P		<0.05			

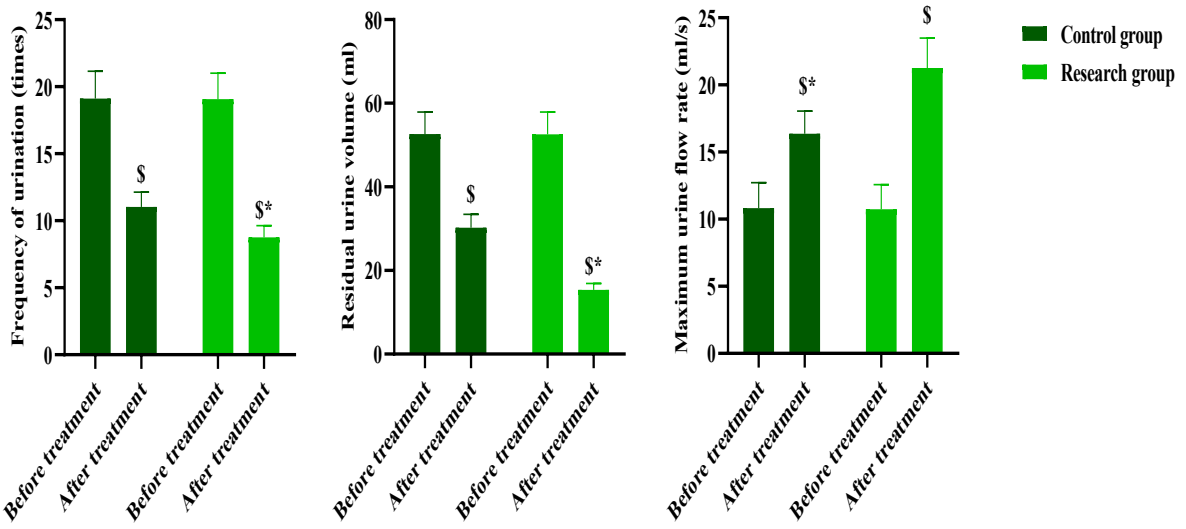

Figure 1: Postoperative urination function changes in both groups. $P<0.05, relative to before treatment, *P<0.05, relative to the CG

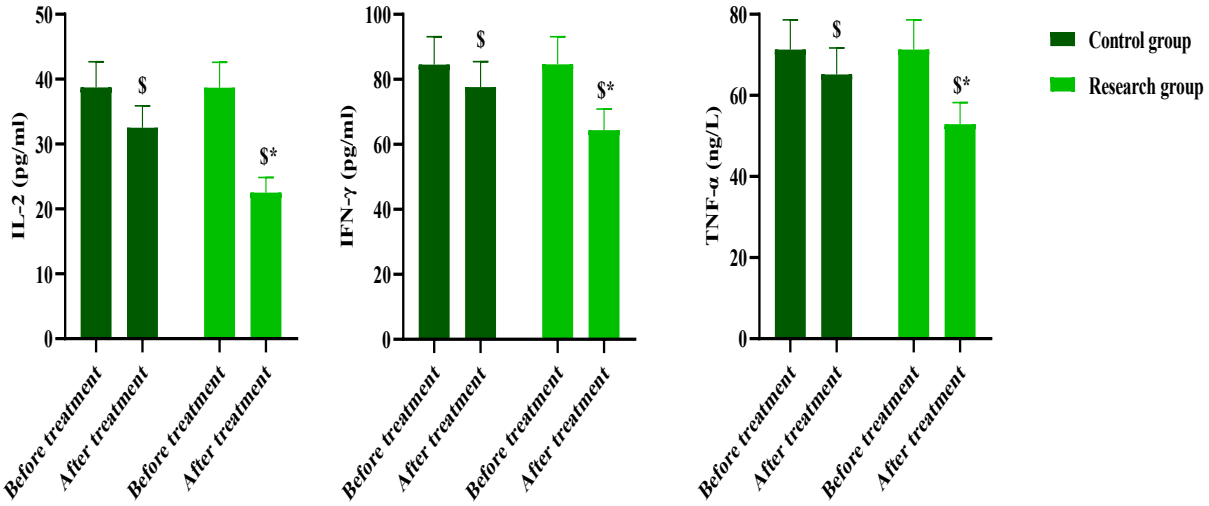

Figure 2: Levels of inflammatory factors in both groups. $P<0.05, relative to before treatment, *P<0.05, relative to the CG

Quality of life scores in both groups

In postoperative follow-up, the quality of life scores including total health score, physiological function score, role physical score, body pain score, vitality score, social function score, emotional function score and mental health score of the RG were higher as compared to the CG (P<0.05, Figure 3).

Incidence of adverse reactions in both groups

The occurrence of adverse reactions in the RG was 7.8%, presented lower as compared to that of 25.0% in the CG (P<0.05, Table 2).

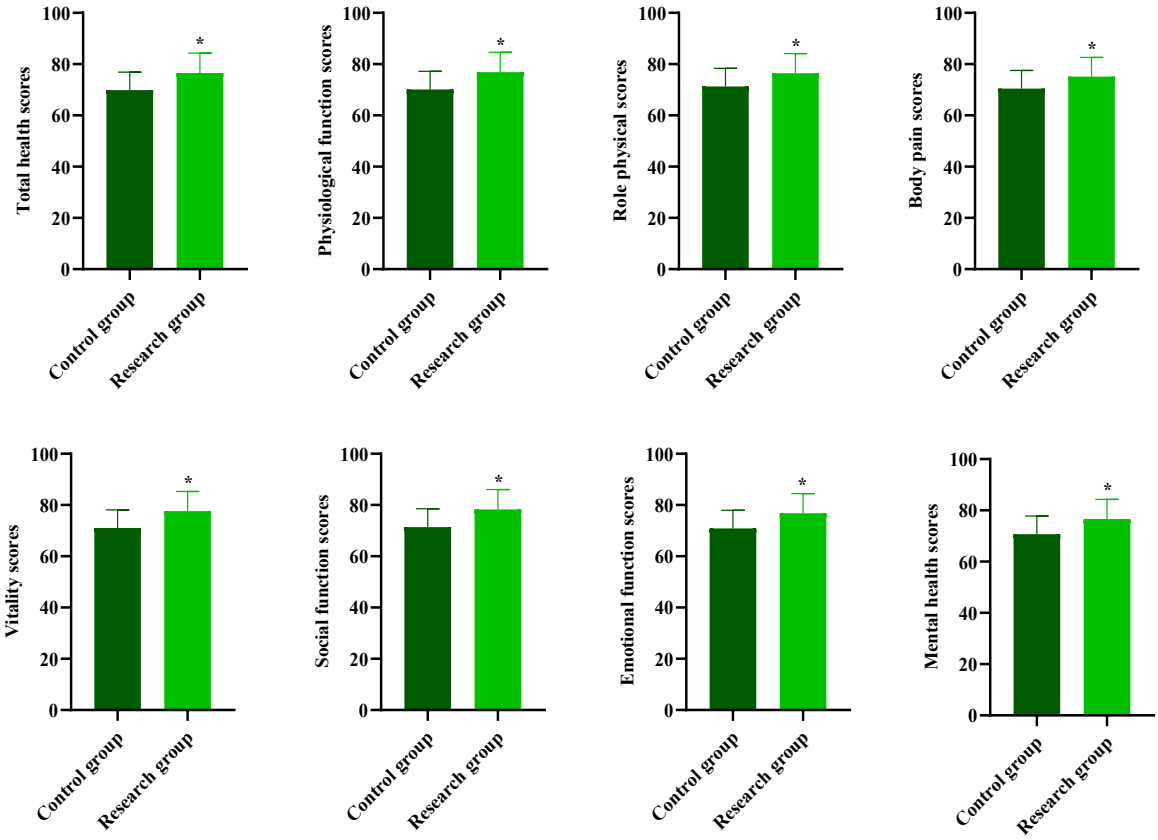

Figure 3: Quality of life scores in both groups. *P<0.05

Table 2: Incidence of adverse reactions in both groups

Groups	N	Bladder irritation symptoms	Myelo-suppression	Renal impairment	Rash	Urethral stricture	Total incidence rate (%)
Control group	64	6 (9.4)	2 (3.1)	3 (4.7)	3 (4.7)	2 (3.1)	16 (25.0)
Research group	64	3 (4.7)	0 (0.0)	0 (0.0)	2 (3.1)	0 (0.0)	5 (7.8)
χ^2		6.9					
P		<0.05					

Discussion

Glandular cystitis is a rare proliferative lesion of bladder mucous epithelium.[10] The main presentations of the patients are hematuria, frequent urination, urgent urination, painful urination, and distension and discomfort of the lower abdomen.[11] Glandular cystitis can affect the trigone of the bladder, the neck of the bladder and the tissues around the bilateral ureteral orifice, accompanied by follicular lesions or edema, chronic inflammation and so on.[12] The etiology of this disease is not clear. Studies have reported that the risk factors such as exposure time, course of disease, bladder stones, and impaired urination may promote the transformation of glandular cystitis into bladder cancer.[13] Although the academic community is divided on whether glandular cystitis is a precancerous lesion, the disease is prone to relapse and has serious physical and mental effects on patients, so active and effective treatment and regular follow-up should be carried out.[14]

At present, transurethral resection is often used to treat glandular cystitis.[15] Low-temperature

resection has little damage to the urethral sphincter of patients, and the narrow ureteral opening will not affect the operation and will not cause obturator nerve reflex.[16] Researches have manifested that this operation has strengths containing simplicity, fast hemostasis, short operation time, fewer complications of bladder perforation, and no reduction of the patient's bladder volume after surgery.[17] Nevertheless, several clinical reports have also pointed out that transurethral resection is difficult to effectively control the progression of glandular cystitis, and the overall effect is moderate and prone to recurrence.[18]

With the increasing research on glandular cystitis and its treatment methods, some experts believe that glandular cystitis is prone to recurrence and may become cancerous, so they advocate postoperative perfusion of antitumor drugs to remove residual lesions and prevent recurrence and cancerous changes.[19] Sapylin is a lyophilized preparation of human type A hemolytic streptococcus cultured and cultured and treated with penicillin.[20] It is also a superantigen and non-traditional chemotherapeutic drug for bladder infusion. This drug has significant immunological activity and can effectively prevent the recurrence of glandular cystitis by stimulating cellular and humoral immunity of the body.[9] At present, it has been widely applied in the therapy of various cancers.[21,22]

The results of this study indicate that relative to the CG, the RG had better total effective rate, which indicated that the therapeutic effect of transurethral resection combined with sapylin perfusion was better. Additionally, three months postoperatively, the number of urination and residual urine volume were less, and the maximum urine flow rate was elevated. Relative to the CG the frequency and residual urine volume of the RG declined and the maximum urine flow rate was elevated at 3 months after surgery, which implied that postoperative urination function was improved in both groups, but the improvement of urination function was more significant after sapylin perfusion.

As reported previously, cytokines have a crucial role in the development of glandular cystitis.[23] Cytokines have the potential of transmitting information and regulating immune function.[24] IL-2, IFN-γ, TNF-α and other cytokines are mostly inflammatory factors, and excessive release and interaction are the basic pathological mechanisms that induce tissue cell proliferation, metaplasia, damage and malignant transformation in various inflammatory and related diseases,[25] and also have a crucial function in the progression of glandular cystitis.[26] Elevated levels of the above indexes can accelerate the progression of disease, break the balance of the body, and lead to immune dysfunction.[27] In this study, the outcomes exhibited that after treatment, the improvements of inflammatory markers in the RG were better than the CG. Meanwhile, the occurrence of adverse reactions in the RG was lower as comparing to the CG. All these findings implied that transurethral resection combined with sapylin perfusion could significantly improve inflammation and does not increase the probability of adverse reactions. Therefore, patients' quality of life in the RG was better as comparing to the CG.

Strengths and limitations

This was a well-designed and randomized controlled trial, and provide a promising reference for the treatment of glandular cystitis. The main limitation is the lack of long-term follow-up.

Conclusion

The effect of transurethral resection combined with sapylin for bladder perfusion in the treatment of glandular cystitis is better, which is worthy for promotion.

Competing interests

The authors report no actual or potential conflicts of interest.

Contribution of authors

Guan Y, Tan CB, Xiao F and Li HY: conception and design. Liu HT and Hu W: analysis and interpretation of data. Song HJ and Zhu HC: drafting the article or revising it critically for important intellectual content. All authors: final approval of the version to be published, Yi Guan

and Changbin Tan are contributed equally to this work.

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