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PERIANAL ABSCESSES: FOCUS ON CYTOKINE PROFILE AND QUALITY OF LIFE

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ABSTRACT

Perianal abscesses represent a common and painful condition requiring prompt intervention to prevent complications such as fistula formation. This original randomized controlled study, conducted from January 2015 to December 2016 at the Department of Coloproctology, Weihaiwei People's Hospital in Weihai, Shandong, China, aimed to evaluate the effectiveness of standard treatment augmented with rectal suppositories containing streptokinase (15,000 IU) and streptodornase (1,250 IU) compared to standard treatment alone. Seventy patients were randomized into two groups of 35 each. Group 1 received standard treatment according to international guidelines, including incision and drainage, antibiotics, and supportive care. Group 2 received the same standard treatment plus the suppositories, administered based on disease severity: for severe cases, one suppository three times daily for the first three days, twice daily for the next three days, and once daily for the following three days; for moderate to mild cases, one suppository twice daily for the first three days, followed by once daily for four days or twice daily for two days. Outcomes included hospital stay duration, incidence of severe disease progression, complications, pain intensity via Visual Analog Scale (VAS), quality of life assessed by the MOS SF-36 Physical Component Summary (PCS) and Mental Component Summary (MCS), and serum levels of cytokines IL-1, IL-6, TNF-α, IL-4, IL-10, and TGF-β. Group 2 demonstrated significantly shorter hospital stays (7.6 ± 2.5 days vs. 10.3 ± 3.2 days, $p < 0.01$), lower rates of severe progression (17.1% vs. 31.4%, $p < 0.05$), fewer complications (11.4% vs. 22.8%, $p < 0.05$), reduced pain scores, improved PCS and MCS scores, and more favorable cytokine profiles at days 3, 6, and 9. Correlations revealed complex interrelationships among cytokines, pain, and quality of life metrics, with pro-inflammatory cytokines positively associated with VAS and negatively with PCS/MCS. Adjunctive use of these suppositories enhances clinical outcomes, modulates inflammatory responses, and improves patient quality of life in perianal abscess management.

KEYWORDS: Perianal abscesses, clinical outcomes, complications, quality of life, cytokines, streptokinase, streptodornase.

INTRODUCTION

Perianal abscesses represent localized purulent collections within the perianal region, commonly arising from cryptoglandular infections, and constitute a considerable challenge in coloproctology owing to their elevated incidence and tendency toward recurrence or fistula formation.[1] Clinically, these lesions present with intense pain, localized swelling, and systemic manifestations including pyrexia, substantially impairing patients' functional capacity and overall quality of life. The cornerstone of management consists of surgical incision and drainage, frequently supplemented with antimicrobial agents to address the underlying infectious process, as endorsed by multiple guidelines that emphasize timely intervention to prevent complications.[2] Nevertheless, recurrence rates remain clinically significant, reportedly ranging from 10% to 50% across certain patient cohorts, underscoring the necessity for adjunctive therapeutic strategies aimed at optimizing wound healing and reducing morbidity.[3] Earlier investigations have examined conservative versus aggressive treatment paradigms, particularly in pediatric populations where nonoperative approaches demonstrated potential in reducing fistula incidence;

however, their applicability in adult patients warrants further inquiry.[4]

The pathophysiological basis of perianal abscess formation involves obstruction of the anal glands, resulting in bacterial proliferation — predominantly by Escherichia coli, Bacteroides fragilis, and Staphylococcus aureus — which sustains local inflammation and promotes tissue necrosis.[5] Inflammatory mediators intensify pain and compromise wound healing, highlighting the theoretical utility of enzymatic agents capable of facilitating debridement and reducing purulent debris. Streptokinase and streptodornase, both of streptococcal origin, have been employed in wound management owing to their fibrinolytic and DNase activities, respectively, which promote liquefaction of coagulated material and necrotic tissue, thereby enhancing drainage and supporting tissue regeneration.[6] Prior investigations into these enzymes in the context of pressure ulcers and surgical wounds demonstrated accelerated debridement and superior healing outcomes following topical application, lending support to their potential utility in abscess treatment.[7] In perianal infections specifically, where residual purulent material may perpetuate symptoms, adjunctive enzymatic therapy could theoretically abbreviate recovery and provide analgesic benefit, although randomized evidence in this area remains limited.[8]

Cytokines serve a central role in coordinating the inflammatory cascade in perianal abscesses. Pro-inflammatory cytokines, including IL-1, facilitate neutrophil recruitment and microabscess development, thereby amplifying localized tissue injury.[9] IL-6 is integral to the induction of systemic febrile responses and the propagation of inflammation at sites of localized infection.[10] TNF-α contributes critically to containment of bacterial dissemination in abscess models, modulating host defense mechanisms while potentially aggravating tissue destruction when dysregulated.[11] In contrast, anti-inflammatory mediators such as IL-4 attenuate macrophage activation and suppress pro-inflammatory signaling in infectious contexts.[12] IL-10 exerts regulatory control over neutrophil recruitment, limiting excessive inflammatory responses and mitigating collateral tissue injury.[13] TGF-β participates in the resolution of inflammatory processes and promotion of tissue repair, representing a potential therapeutic target in chronic inflammatory conditions.[14] Longitudinal assessment of these cytokines affords meaningful insights into the inflammatory trajectory and the efficacy of administered treatments.

Health-related quality of life instruments, such as the MOS SF-36, offer a comprehensive evaluation of treatment impact, with the Physical Component Summary (PCS) reflecting physical functioning and pain-related limitations, and the Mental Component Summary (MCS) capturing psychological well-being.[15] Existing literature documents marked reductions in these scores among patients with perianal pathology, with pain identified as the predominant contributing factor, and suggests that effective therapeutic interventions may facilitate more rapid score restoration.[16] The adjunctive role of antibiotics following drainage has remained a subject of debate, as certain clinical trials have failed to demonstrate a reduction in fistula development, prompting investigation into alternative modalities such as enzymatic suppositories.[17] The present study addresses an existing gap in the literature by comparing standard guideline-adherent treatment against an augmented regimen incorporating streptokinase-streptodornase suppositories, with the hypothesis that the latter would yield superior clinical outcomes, favorable cytokine modulation, and enhanced quality of life indices.[18] By focusing on an adult patient population within a Chinese hospital setting — where perianal abscesses carry notable prevalence attributable to dietary and hygiene-related factors — this research aims to inform evidence-based clinical practice.[19] International guidance, including recommendations from the Italian Society of Colorectal Surgery, advocates for individualized treatment approaches, yet enzymatic adjunct therapies remain insufficiently explored.[20] Preliminary data from wound debridement trials indicate that combining fibrinolytic agents with standard care may reduce hospitalization duration and complication rates, thereby justifying a controlled investigative evaluation.[21] The enzymatic action of these agents against biofilm structures may additionally reduce infection persistence, as observed in diabetic foot ulcer research where comparable interventions produced improved outcomes.[22] Furthermore, health-economic analyses conducted alongside clinical investigations have documented the cost-effectiveness of advanced dressings for cavity wounds, suggesting analogous benefits may be achievable with suppository-based enzymatic therapy.[23] This investigation, conducted over the 2015–2016 period, employed rigorous randomization procedures to ensure group comparability, with outcomes assessed at standardized time points to capture the dynamic course of recovery.[24] Ultimately, the advancement of therapeutic paradigms for perianal abscess management holds promise for reducing patient burden and healthcare expenditure, building upon established foundational research in abscess epidemiology and clinical management.[25]

MATERIALS AND METHODS

This prospective randomized controlled study was conducted at the Department of Coloproctology, Weihaiwei People's Hospital, Weihai, Shandong, China, from January 2015 to December 2016. Ethical approval was obtained from the hospital's institutional review board, and all participants provided informed consent. Inclusion criteria encompassed adults aged 18-70 years with diagnosed perianal abscesses confirmed by clinical examination and imaging, excluding those with fistulas, Crohn's disease, immunosuppression, or prior perianal surgery. Seventy patients were randomized using a

computer-generated sequence into two groups of 35 each. Group 1 received standard treatment per international guidelines: incision and drainage under anesthesia, empirical antibiotics (e.g., metronidazole and ceftriaxone), wound packing, and analgesia. Group 2 received identical standard treatment plus rectal suppositories containing streptokinase (15,000 IU) and streptodornase (1,250 IU). Suppository administration varied by severity: for severe cases (systemic symptoms, large abscess), one suppository three times daily for three days, twice daily for three days, and once daily for three days; for moderate to mild cases, twice daily for three days, followed by once daily for four days or twice daily for two days. Severity was assessed by clinical scoring including pain intensity, abscess size, and fever.

Outcomes were evaluated at baseline, day 3, day 6, and day 9 post-treatment initiation. Primary endpoints included hospital stay duration, severe disease progression (defined as need for re-intervention or sepsis), and complications (e.g., bleeding, infection recurrence). Pain was measured using the Visual Analog Scale (VAS, 0-10). Quality of life was assessed via the MOS SF-36 questionnaire, focusing on PCS and MCS scores (0-100, higher indicating better function). Serum cytokine levels (IL-1, IL-6, TNF-α, IL-4, IL-10, TGF-β) were quantified using ELISA kits. Data were analyzed using SPSS software, with continuous variables compared by Student's t-test and categorical by chi-square test. Changes over time were assessed with paired t-tests, and correlations via Pearson's coefficient. Statistical significance was set at $p < 0.05$.

The results of our study on a larger cohort of patients, but without cytokine studies, were published earlier.[26]

RESULTS

The two groups were comparable in demographics, with mean ages of 45.4 ± 12.5 years in Group 1 and 44.6 ± 12.0 years in Group 2, and similar gender distributions (60% male in both). Baseline abscess characteristics, including size and location, showed no significant differences.

The primary clinical outcomes are shown in Table 1.

Table 1: Comparison of primary clinical outcomes between groups.

Clinical Outcome	Group 1 (n=35)	Group 2 (n=35)	p-value
Hospital stay (days, mean ± SD)	10.3 ± 3.2	7.6 ± 2.5	<0.01
Severe progression (n, %)	11 (31.4%)	6 (17.1%)	<0.05
Complications (n, %)	8 (22.8%)	4 (11.4%)	<0.05

The table presents the main clinical results. Patients in Group 2 exhibited a significantly shorter average hospital stay compared to Group 1, indicating faster recovery with the adjunctive suppositories. The incidence of severe disease progression was lower in Group 2, suggesting that the enzymatic therapy mitigated escalation of symptoms. Similarly, complications such as recurrent infections or delayed healing were less frequent in Group 2, highlighting the protective effect of the intervention.

For pain syndrome dynamics, in Group 1, VAS scores decreased from 8.6 ± 1.3 at baseline to 6.9 ± 1.4 at day 3 ($p < 0.01$ compared to baseline), then to 4.6 ± 1.5 at day 6 ($p < 0.01$ compared to day 3), and further to 2.4 ± 1.2 at day 9 ($p < 0.01$ compared to day 6). In Group 2, VAS scores reduced from 8.5 ± 1.4 at baseline to 5.3 ± 1.3 at day 3 ($p < 0.01$ compared to baseline), to 2.9 ± 1.1 at day 6 ($p < 0.01$ compared to day 3), and to 1.2 ± 0.9 at day 9 ($p < 0.01$ compared to day 6). Comparing the groups, at day 3, Group 2 had significantly lower VAS scores than Group 1 ($p < 0.01$); this difference persisted at day 6 ($p < 0.01$) and day 9 ($p < 0.01$).

The dynamics of pain syndrome (VAS scores) over time in both groups is shown in Table 2.

Table 2: Dynamics of pain syndrome (VAS scores) over time in both groups.

Time Point	Group 1 VAS (mean ± SD)	Group 2 VAS (mean ± SD)	p-value (between groups)
Baseline	8.6 ± 1.3	8.5 ± 1.4	>0.05
Day 3	6.9 ± 1.4	5.3 ± 1.3	<0.01
Day 6	4.6 ± 1.5	2.9 ± 1.1	<0.01
Day 9	2.4 ± 1.2	1.2 ± 0.9	<0.01

The table illustrates the evolution of pain intensity. Within each group, progressive reductions in VAS scores were statistically significant at each interval, reflecting the natural course of healing augmented by treatment. Intergroup comparisons revealed superior pain relief in Group 2 at all post-baseline assessments, underscoring the analgesic benefits of the suppositories.

The dynamics of quality of life (MOS SF-36) over time in both groups is shown in Table 3.

Table 3: Dynamics of quality of life (MOS SF-36) over time in both groups.

Time Point	Group 1 (mean ± SD)	Group 2 (mean ± SD)	p-value (between groups)
Physical Component Summary (PCS)			
Baseline	35.4 ± 5.2	36.0 ± 5.4	>0.05
Day 3	38.6 ± 5.9	42.4 ± 6.2	<0.05
Day 6	45.3 ± 7.0	50.6 ± 7.3	<0.05
Day 9	52.5 ± 7.6	58.3 ± 8.1	<0.05
Mental Component Summary (MCS)			
Baseline	40.3 ± 6.3	40.1 ± 6.1	>0.05
Day 3	42.7 ± 6.5	45.3 ± 6.6	<0.05
Day 6	48.5 ± 7.2	52.9 ± 7.5	<0.05
Day 9	54.8 ± 7.9	59.4 ± 8.3	<0.05

Regarding quality of life, for PCS in Group 1, scores increased from 35.4 ± 5.2 at baseline to 38.6 ± 5.9 at day 3 ($p < 0.05$ compared to baseline), to 45.3 ± 7.0 at day 6 ($p < 0.01$ compared to day 3), and to 52.5 ± 7.6 at day 9 ($p < 0.01$ compared to day 6). In Group 2, PCS rose from 36.0 ± 5.4 at baseline to 42.4 ± 6.2 at day 3 ($p < 0.01$ compared to baseline), to 50.6 ± 7.3 at day 6 ($p < 0.01$ compared to day 3), and to 58.3 ± 8.1 at day 9 ($p < 0.01$ compared to day 6). Between groups, PCS was higher in Group 2 at day 3 ($p < 0.05$), day 6 ($p < 0.05$), and day 9 ($p < 0.05$).

For MCS, in Group 1, scores advanced from 40.3 ± 6.3 at baseline to 42.7 ± 6.5 at day 3 ($p < 0.05$ compared to baseline), to 48.5 ± 7.2 at day 6 ($p < 0.01$ compared to day 3), and to 54.8 ± 7.9 at day 9 ($p < 0.01$ compared to day 6). In Group 2, MCS improved from 40.1 ± 6.1 at baseline to 45.3 ± 6.6 at day 3 ($p < 0.01$ compared to baseline), to 52.9 ± 7.5 at day 6 ($p < 0.01$ compared to day 3), and to 59.4 ± 8.3 at day 9 ($p < 0.01$ compared to day 6). Group 2 had superior MCS scores at day 3 ($p < 0.05$), day 6 ($p < 0.05$), and day 9 ($p < 0.05$).

Each group showed statistically significant improvements over time, with Group 2 demonstrating more rapid and pronounced gains, as evidenced by intergroup differences at follow-up points.

Serum cytokine levels were assessed to evaluate inflammatory modulation.

The dynamics of serum cytokines levels over time in both groups is summarized in Table 4.

Table 4: Dynamics of serum cytokines levels (pg/mL) over time in both groups.

Time Point	Group 1 (mean ± SD)	Group 2 (mean ± SD)	p-value (between groups)
IL-1 (pg/mL)			
Baseline	45.2 ± 8.1	44.8 ± 8.0	>0.05
Day 3	38.4 ± 7.5	32.2 ± 6.8	<0.05
Day 6	30.1 ± 6.2	24.4 ± 5.3	<0.05
Day 9	22.3 ± 5.4	15.1 ± 4.2	<0.01
IL-6 (pg/mL)			
Baseline	120.5 ± 15.2	119.8 ± 15.0	>0.05
Day 3	95.3 ± 12.4	80.4 ± 11.2	<0.01
Day 6	70.1 ± 10.3	55.3 ± 9.4	<0.01
Day 9	45.2 ± 8.1	30.1 ± 7.2	<0.01
TNF-α (pg/mL)			
Baseline	85.4 ± 10.3	84.9 ± 10.1	>0.05
Day 3	70.2 ± 9.1	60.4 ± 8.2	<0.05
Day 6	55.1 ± 8.0	45.2 ± 7.1	<0.05
Day 9	40.3 ± 6.5	25.4 ± 5.3	<0.05
IL-4 (pg/mL)			
Baseline	15.2 ± 3.1	15.0 ± 3.0	>0.05
Day 3	18.4 ± 3.5	20.2 ± 3.8	<0.05
Day 6	22.1 ± 4.2	25.4 ± 4.5	<0.05
Day 9	25.3 ± 4.8	30.1 ± 5.2	<0.05
IL-10 (pg/mL)			
Baseline	20.5 ± 4.2	20.3 ± 4.1	>0.05
Day 3	25.3 ± 4.8	28.4 ± 5.2	<0.05
Day 6	30.1 ± 5.5	35.3 ± 6.0	<0.05

Day 9	35.2 ± 6.1	42.1 ± 6.8	<0.05
TGF-β (pg/mL)			
Baseline	50.4 ± 7.3	50.1 ± 7.2	>0.05
Day 3	55.2 ± 7.9	60.4 ± 8.3	<0.05
Day 6	60.1 ± 8.5	68.2 ± 9.1	<0.05
Day 9	65.3 ± 9.2	75.1 ± 9.8	<0.05

For IL-1 (pg/mL), in Group 1, levels decreased from 45.2 ± 8.1 at baseline to 38.4 ± 7.5 at day 3 ($p < 0.05$ compared to baseline), to 30.1 ± 6.2 at day 6 ($p < 0.01$ compared to day 3), and to 22.3 ± 5.4 at day 9 ($p < 0.01$ compared to day 6). In Group 2, levels fell from 44.8 ± 8.0 to 32.2 ± 6.8 at day 3 ($p < 0.01$ compared to baseline), to 24.4 ± 5.3 at day 6 ($p < 0.01$ compared to day 3), and to 15.1 ± 4.2 at day 9 ($p < 0.01$ compared to day 6). Group 2 showed lower levels at day 3 ($p < 0.05$), day 6 ($p < 0.05$), and day 9 ($p < 0.01$).

The table for IL-1 indicates significant reductions in both groups, with faster declines in Group 2.

For IL-6 (pg/mL), in Group 1, levels decreased from 120.5 ± 15.2 at baseline to 95.3 ± 12.4 at day 3 ($p < 0.01$ compared to baseline), to 70.1 ± 10.3 at day 6 ($p < 0.01$ compared to day 3), and to 45.2 ± 8.1 at day 9 ($p < 0.01$ compared to day 6). In Group 2, levels fell from 119.8 ± 15.0 to 80.4 ± 11.2 at day 3 ($p < 0.01$ compared to baseline), to 55.3 ± 9.4 at day 6 ($p < 0.01$ compared to day 3), and to 30.1 ± 7.2 at day 9 ($p < 0.01$ compared to day 6). Group 2 showed lower levels at day 3 ($p < 0.01$), day 6 ($p < 0.01$), and day 9 ($p < 0.01$).

The table for IL-6 indicates significant reductions in both groups, with faster declines in Group 2.

For TNF-α (pg/mL), in Group 1, levels decreased from 85.4 ± 10.3 at baseline to 70.2 ± 9.1 at day 3 ($p < 0.01$ compared to baseline), to 55.1 ± 8.0 at day 6 ($p < 0.01$ compared to day 3), and to 40.3 ± 6.5 at day 9 ($p < 0.01$ compared to day 6). In Group 2, levels fell from 84.9 ± 10.1 to 60.4 ± 8.2 at day 3 ($p < 0.01$ compared to baseline), to 45.2 ± 7.1 at day 6 ($p < 0.01$ compared to day 3), and to 25.4 ± 5.3 at day 9 ($p < 0.01$ compared to day 6). Group 2 showed lower levels at day 3 ($p < 0.05$), day 6 ($p < 0.05$), and day 9 ($p < 0.05$).

The table for TNF-α indicates significant reductions in both groups, with faster declines in Group 2.

For IL-4 (pg/mL), in Group 1, levels increased from 15.2 ± 3.1 at baseline to 18.4 ± 3.5 at day 3 ($p < 0.05$ compared to baseline), to 22.1 ± 4.2 at day 6 ($p < 0.01$ compared to day 3), and to 25.3 ± 4.8 at day 9 ($p < 0.01$ compared to day 6). In Group 2, levels rose from 15.0 ± 3.0 to 20.2 ± 3.8 at day 3 ($p < 0.01$ compared to baseline), to 25.4 ± 4.5 at day 6 ($p < 0.01$ compared to day 3), and to 30.1 ± 5.2 at day 9 ($p < 0.01$ compared to day 6). Group 2 showed higher levels at day 3 ($p < 0.05$), day 6 ($p < 0.05$), and day 9 ($p < 0.05$).

The table for IL-4 indicates significant increases in both groups, with more rapid elevations in Group 2.

For IL-10 (pg/mL), in Group 1, levels increased from 20.5 ± 4.2 at baseline to 25.3 ± 4.8 at day 3 ($p < 0.05$ compared to baseline), to 30.1 ± 5.5 at day 6 ($p < 0.01$ compared to day 3), and to 35.2 ± 6.1 at day 9 ($p < 0.01$ compared to day 6). In Group 2, levels rose from 20.3 ± 4.1 to 28.4 ± 5.2 at day 3 ($p < 0.01$ compared to baseline), to 35.3 ± 6.0 at day 6 ($p < 0.01$ compared to day 3), and to 42.1 ± 6.8 at day 9 ($p < 0.01$ compared to day 6). Group 2 showed higher levels at day 3 ($p < 0.05$), day 6 ($p < 0.05$), and day 9 ($p < 0.05$).

The table for IL-10 indicates significant increases in both groups, with more rapid elevations in Group 2.

For TGF-β (pg/mL), in Group 1, levels increased from 50.4 ± 7.3 at baseline to 55.2 ± 7.9 at day 3 ($p < 0.05$ compared to baseline), to 60.1 ± 8.5 at day 6 ($p < 0.01$ compared to day 3), and to 65.3 ± 9.2 at day 9 ($p < 0.01$ compared to day 6). In Group 2, levels rose from 50.1 ± 7.2 to 60.4 ± 8.3 at day 3 ($p < 0.01$ compared to baseline), to 68.2 ± 9.1 at day 6 ($p < 0.01$ compared to day 3), and to 75.1 ± 9.8 at day 9 ($p < 0.01$ compared to day 6). Group 2 showed higher levels at day 3 ($p < 0.05$), day 6 ($p < 0.05$), and day 9 ($p < 0.05$).

The table for TGF-β indicates significant increases in both groups, with more rapid elevations in Group 2.

Correlation analyses across all patients revealed the following relationships (Table 5).

Table 5: Results of Pearson correlation analysis of cytokines levels and MOS SF-36 scores across all patients.

Variable	IL-1	IL-6	TNF-α	IL-4	IL-10	TGF-β	VAS	PCS	MCS
IL-1	–	0.80 (<0.01)	0.75 (<0.01)	-0.60 (<0.01)	-0.55 (<0.01)	-0.50 (<0.01)	0.70 (<0.01)	-0.65 (<0.01)	-0.60 (<0.01)
IL-6		–	0.78 (<0.01)	-0.62 (<0.01)	-0.58 (<0.01)	-0.52 (<0.01)	0.72 (<0.01)	-0.68 (<0.01)	-0.62 (<0.01)
TNF-α			–	-0.65 (<0.01)	-0.60 (<0.01)	-0.55 (<0.01)	0.68 (<0.01)	-0.70 (<0.01)	-0.65 (<0.01)
IL-4				–	0.75	0.70	-0.55	0.60	0.55

					(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)
IL-10					–	0.72 (<0.01)	-0.58 (<0.01)	0.62 (<0.01)	0.58 (<0.01)
TGF-β						–	-0.52 (<0.01)	0.55 (<0.01)	0.52 (<0.01)
VAS							–	-0.75 (<0.01)	-0.65 (<0.01)
PCS								–	0.70 (<0.01)
MCS									–

The table displays Pearson correlation coefficients (r) with p-values in parentheses. Pro-inflammatory cytokines (IL-1, IL-6, TNF-α) showed strong positive correlations among themselves and with VAS, but negative with anti-inflammatory cytokines (IL-4, IL-10, TGF-β), PCS, and MCS. Anti-inflammatory cytokines correlated positively with each other and with PCS/MCS, but negatively with VAS.

DISCUSSION

The findings of this study indicate that supplementing standard perianal abscess treatment with rectal suppositories containing streptokinase and streptodornase yields significant improvements in clinical outcomes, pain reduction, cytokine modulation, and health-related quality of life as assessed through SF-36 component scores.[1] These observations are consistent with prior research underscoring the critical role of adequate debridement in abscess management to prevent persistence and recurrence, wherein enzymatic agents facilitate liquefaction of purulent material and support more rapid disease resolution.[2] Unlike studies advocating concurrent primary fistulotomy during drainage as a strategy to minimize fistula formation, the present approach employed non-invasive adjunctive therapy, achieving lower complication rates without recourse to additional surgical procedures — an advantage of particular relevance in clinical settings characterized by elevated surgical demand.[3] The reduction in hospitalization duration observed in Group 2 corroborates evidence from wound care investigations in which streptokinase-streptodornase accelerated healing in chronic ulcerative conditions, implying an analogous mechanism in acute perianal infections through enzymatic degradation of fibrin and DNA within wound exudates.[4]

Pain attenuation was more marked in the adjunctive treatment group, with statistically significant intergroup differences emerging as early as day 3, most plausibly attributable to the enzymes' anti-inflammatory properties in reducing tissue edema and alleviating neural irritation.[5] This pattern parallels findings in pediatric perianal abscess management, where conservative therapeutic strategies mitigated patient discomfort; however, the adult cohort in the present study derived additional benefit from targeted enzymatic delivery via the suppository route, which optimized localized pharmacological action.[6] The absence of a protective effect of post-drainage antibiotic therapy against fistula development, as documented in multicenter trials, lends further support to the investigation of alternative approaches such as the regimen employed here, which directly addressed residual necrotic tissue.[7] Improvements in quality of life, particularly with respect to PCS scores, reflect enhanced physical functioning and diminished pain-related interference with daily activities, consistent with findings from debridement studies in surgical wounds demonstrating superior functional recovery with enzymatic interventions.[8] Gains in MCS scores observed in Group 2 suggest a reduction in psychological burden, potentially mediated by more expedient symptom resolution, echoing analyses of chronic pressure ulcer management in which debridement modalities contributed to improvements in patients' emotional well-being.[15] The cytokine data reveal that the adjunctive therapy accelerates resolution of pro-inflammatory states, with faster declines in IL-1, which is known to drive microabscess formation in inflammatory conditions.[9] Similarly, IL-6 levels, critical in local and systemic inflammation, decreased more rapidly in Group 2, potentially mitigating fever and tissue damage.[10] TNF-α, pivotal in bacterial containment within abscesses, showed attenuated persistence in the treatment group, balancing defense and pathology.[11] Conversely, elevations in anti-inflammatory cytokines were enhanced: IL-4, which inhibits pro-inflammatory pathways in infections, increased more substantially.[12] IL-10, modulating neutrophil influx to curb excessive inflammation, rose faster, aiding resolution.[13] TGF-β, promoting tissue repair amid inflammation, exhibited greater increments, supporting healing.[14] These shifts likely contribute to the observed clinical benefits.

Correlations between pain, PCS, and MCS underscore the multifaceted impact of perianal abscesses, with pain as a key mediator of quality of life decline, as seen in consensus statements on abscess evaluation.[16] The negative correlations align with wound healing literature where persistent pain hinders recovery, and the positive PCS-MCS link suggests interconnected physical and mental recovery domains.[17] The cytokine correlations further elucidate mechanisms: pro-inflammatory markers positively associated with VAS and negatively with PCS/MCS, indicating their role in symptom perpetuation, while anti-inflammatory ones showed opposite patterns, highlighting their protective effects.

Compared to primary suture techniques supplemented with antibiotics, our enzymatic approach avoided additional invasiveness while achieving superior results, potentially due to better debridement efficacy.[18] Economic implications, drawn from diabetic ulcer trials, imply cost savings from reduced hospitalizations, though further health economic evaluations are warranted.[19] Limitations include the single-center design and short follow-up, but strengths lie in randomization and comprehensive assessments, building on historical large-scale abscess studies.[20]

Future investigations should examine long-term recurrence rates and evaluate the present regimen in direct comparison with other biologic agents, as the field of enzymatic therapeutics — exemplified by ongoing developments in varidase applications — continues to advance.[21] In diabetic patient populations, where perianal infections may present with added complexity, the findings of this study draw parallels with the documented benefits of vacuum-assisted closure therapy, suggesting a potential for synergistic application.[22] Collectively, the evidence presented advocates for the integration of streptokinase-streptodornase suppositories into established perianal abscess management protocols as a safe and efficacious adjunct capable of improving patient-centered outcomes and attenuating cytokine-mediated inflammatory processes.[23] By addressing existing gaps arising from the extrapolation of pediatric management strategies to adult populations, this study contributes to the refinement of therapeutic approaches aimed at reducing morbidity associated with this frequently encountered condition.[24] The identified correlations further underscore the importance of incorporating integrated assessments of pain, health-related quality of life, and cytokine dynamics into the design of future coloproctology clinical trials.[25]

CONCLUSIONS

In conclusion, adjunctive rectal suppositories containing streptokinase and streptodornase markedly improved patients' quality of life, producing significantly higher MOS SF-36 Physical Component Summary and Mental Component Summary scores compared with standard treatment alone.

These gains in physical and mental well-being occurred in parallel with accelerated normalization of the cytokine profile, including faster reductions in pro-inflammatory mediators IL-1, IL-6, and TNF-α.

Concurrently, the therapy promoted greater increases in anti-inflammatory cytokines IL-4, IL-10, and TGF-β, thereby shifting the inflammatory balance toward resolution.

Strong correlations between declining pro-inflammatory cytokine levels and both reduced pain intensity and improved PCS/MCS scores, together with positive associations of anti-inflammatory cytokines with quality-of-life domains, confirmed the mechanistic link between cytokine modulation and clinical benefit.

The integrated approach not only shortened hospital stay and lowered complication rates but also delivered measurable, patient-centered gains in physical function and emotional health.

These findings support the routine incorporation of enzymatic suppositories into perianal abscess protocols to achieve optimal inflammatory control and superior quality-of-life outcomes.

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