

Compare the Efficacy of 0.2% Topical Glyceryl Trinitrate (GTN) Versus Placebo in Prevention of Wound Infection in Patients Undergoing Milligan-Morgan Hemorrhoidectomy

KHUMAIR ASIF¹, MAAZ-UL-HASSAN², PIR MUNEEB REHMAN³, TAYYABA RASHEED⁴, LAIBA ZAHID⁵

¹Associate Professor of Surgery, Akhtar Saeed Medical & Dental College Lahore

²Assistant Professor of General Surgery Shalamar Medical & Dental College Lahore

³Senior Registrar of Surgery, Surgical Unit 2, Jinnah Hospital, Lahore

⁴4th Year MBBS Student, GMMMC Sukkur

⁵Lecturer, B.Sc. (Hons) Operation Theater Technology, Department of Health Professional Technologist (DHPT), University of Lahore

Correspondence to: Dr. Khumair Asif, Email: khumairasif@gmail.com, Cell: 0323-4314118

ABSTRACT

Objective: To examine the efficacy of 0.2% topical glyceryltrinitrate and compare with placebo for prevention of wound infection after Milligan Morgan hemorrhoidectomy.

Study Design: Randomized controlled trial

Place & Duration of Study: Department of Surgery, AkhtarSaeed Medical & Dental College Lahore from 1st July 2019 to 31st December 2019.

Methods: One hundred and ten patients of both genders with ages 20 to 65 years were enrolled and divided into two groups (each group contains 55 patients). Group I received of 0.2% topical glyceryltrinitrate ointment and Group II received placebo. Postoperative wound infection was examined at 2 weeks postoperatively. Compare the wound infection rate between both groups.

Results: There were 68 (61.82%) male patients and 42 (38.18%) were females with mean age 34.62±12.46 years. 60 (54.55%) patients had 4th degree hemorrhoidal disease and 50 (45.45%) patients had 3rd degree disease. In group I 8(14.55%) patients had developed wound infection while in group II 30 (54.55%) patients had developed wound infection, a significant difference was observed between both groups with p-value <0.05.

Conclusion: It is concluded that 0.2% glyceryl trinitrate is better and safe treatment modality for the prevention of wound infection.

Keywords: 0.2% Glyceryl Trinitrate, Milligan Morgan Hemorrhoidectomy, Wound Infection

INTRODUCTION

It is estimated that around 10 million people suffer from haemorrhoids in the US. This is a prevalence of around 4.4% with nearly 37 haemorrhoidectomies per 100,000 people per year being performed¹. Post-operative pain is a big problem, with studies showing that patients require 4 to 16 days to return to normal activity. There are many surgical procedures such as the open haemorrhoidectomy of Milligan-Morgan or Ferguson techniques. However there are other procedures which are also carried out with the aim of having low recurrence, minimal post-operative pain and early return to work. A recent systematic review by Burch comparing "procedure for prolapse haemorrhoids" (PPH) with conventional haemorrhoidectomy showed that PPH was associated with less pain in the immediate post-operative period, but a higher rate of recurrence.² The relatively new technique of transanal hemorrhoidal dearterialization has been shown to cause low post-operative pain and have similar results to PPH³.

A controversial belief is that post-operative pain may also be due to poor and delayed wound healing which leads to epithelial denudation. There are studies that have shown agents which improve wound healing also improve post-operative pain^{4,5}. Oral and topical metronidazole have been shown to reduce postoperative pain by promoting wound healing^{6,7}. The amount of pain experienced is also

dependent on a number of other factors such as surgical technique, post-operative analgesia, use of stools softeners, adequate education and subjective pain threshold. Recent evidence suggests that IAS is innervated by neurons that release nitric oxide (NO). Stimulation of these nerves results in the release of NO which then cause relaxation of the IAS¹² by relaxation of smooth muscle. Exogenous GTN ointment is an NO donor which relaxes the IAS and thus reduce pain^{8,9}. There are other forms of nitrates such as nitroderm bands used in post-haemorrhoidectomy to reduce IAS spasm, however the ointment is the most commonly available and used form. The reduction of IAS spasm and reduced pressure will increase anodermal blood flow and therefore improve wound healing. This is believed to be the reason behind improved wound healing in acute anal fissure with GTN ointment^{10,11}. Even though there is no evidence, some believe that GTN may work in a similar fashion and aid wound healing after haemorrhoidectomy. The present study was conducted aimed to examine the efficacy of 0.2% GTN and compare with placebo in prevention of postoperative wound infection after hemorrhoidectomy.

MATERIAL AND METHODS

This randomized controlled trial was conducted at Department of Surgery, Akhtar Saeed Medical & Dental College Lahore from 1st July 2019 to 31st December 2019. A total of 110 patients of both genders with ages 20 to 65 years were enrolled. Patients detailed demographics including age, sex, and body mass index were recorded.

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Patients with emergency hemorrhoidectomy, diabetic patients, patients with renal failure and non-compliance patients were excluded. All the patients were received elective Milligan-Morgan hemorrhoidectomy under general anesthesia. Patients were divided into two groups I and II, each group contains 55 patients. Group I advised to use of 0.2% topical glyceryl trinitrate ointment thrice a day and Group II advised to use placebo thrice a day for 12 days after surgery. Postoperative wound infection was examined at 2 weeks postoperatively. Compare the wound infection rate between both groups. All the data was analyzed by SPSS 24. Chi-square test was done to compare the frequency of wound infection between both groups. P-value <0.05 was taken as significant.

RESULTS

There were 68 (61.82%) male patients and 42(38.18%) were females with mean age 34.62 ± 12.46 years. Mean BMI of patients was 24.52 ± 2.86 kg/m². 60(54.55%) patients had 4th degree hemorrhoidal disease and 50(45.45%) patients had 3rd degree disease (Table 1). At postoperative follow-up, In group I 8(14.55%) patients had developed wound infection while in group II 30(54.55%) patients had developed wound infection, a significant difference was observed between both groups with p-value <0.05 (Table 2).

Table 1: Demographics of all the patients

Variable	No.	%
Age (years)	34.62 ± 12.46	
BMI (Kg/m ²)	24.52 ± 2.86	
Gender		
Male	68	61.82
Female	42	38.18
Hemorrhoid degree		
3 rd	60	54.55
4 th	50	45.45

Table 2: Comparison of wound infection between both groups

Wound infection	Group I	Group II	P value
Yes	8 (14.55%)	30 (54.55%)	0.001
No	47 (85.45%)	25 (45.45%)	

DISCUSSION

Hemorrhoidectomy is one of the most frequently performing surgical procedures in all over the world. Post-operative complications such as wound infection are the commonly found complication and associated with poor quality of life and adverse outcomes.¹² Many of modalities have been applied for the prevention of wound infection, here we performed a study with aimed to compare the efficacy of 0.2% GTN with placebo in patients underwent Milligan-Morgan hemorrhoidectomy. In this regard 110 patients were enrolled. Majority of patients 61.82% were male followed by female 38.18% and mean age of patients was 34.62 ± 12.46 years. These results showed similarity to many of previous studies in which male patients population was high 55% to 70% as compared to females and average age of patients was 35 years.^{13,14}

In present study we found that 60 (54.55%) patients had 4th degree hemorrhoidal disease and 50 (45.45%) patients had 3rd degree disease. A study conducted by Hyder et al¹⁵ reported that 59.67% patients had 3rd degree and 40.32% had 4th degree hemorrhoidal disease. We found that at postoperative follow-up, among 55 patients treated with 0.2% GTN 8 (14.55%) patients had developed wound infection while in group II (placebo) 30 (54.55%) patients had developed wound infection out of 55 patients, a significant difference was observed between both groups with p-value <0.05. These results were similar to the study by Hyder et al.¹⁵ Another study conducted by Khan et al¹⁶ reported that combination of 0.2% GTN and 2% lignocaine showed better pain relief resulting in less use of oral analgesics and faster healing of the wound as compared to placebo with p-value <0.05.

A study conducted by Hwang et al¹⁷ regarding effectiveness of 0.2% GTN for wound healing after hemorrhoidectomy and they demonstrated that 0.2% GTN had higher effectiveness as wound healing rate was 74.5% as compared to placebo 42%. Soltany et al¹⁸ reported that topical application of 0.2% GTN ointment can reduce postoperative pain and improve wound healing after open hemorrhoidectomy.

Some other previous studies showed similarity to our study findings in which 0.2% GTN reported safe and effective for postoperative wound healing as compared to placebo with p-value <0.05^{19,20}.

CONCLUSION

Postoperative wound infection is the frequently found complication after surgical interventions and can lead to adverse outcomes. We concluded that 0.2% glyceryl trinitrate is better and safe treatment modality for the prevention of wound infection.

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