

# Determine the Effectiveness of 0.2% Topical Glyceryl Trinitrate in Preventing Postoperative wound Infection After Hemorrhoidectomy

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## ABSTRACT

**Aim:** To determine the effectiveness of 0.2% topical glyceryl trinitrate in prophylaxis of wound infection in patients undergoing milligan morgan hemorrhoidectomy.

**Study Design:** Randomized controlled trial

**Place & Duration:** Department of surgery Khairpur Medical College (KMC) Hospital, Khairpur Mirs, during the period from January 2019 to June 2019.

**Methods:** One hundred and twenty four patients of both genders undergoing hemorrhoidectomy were enrolled in this study. Detailed demographics including age, sex, BMI and degree of hemorrhoids were recorded after taking written consent. All the patients were categorized into two equal groups. Group A with 62 patients received 0.2% of topical glyceryl trinitrate ointment and Group B received placebo. Postoperative wound infection was examined at 3<sup>rd</sup> week. Data was analyzed by SPSS 24.0.

**Results:** In group A, 42 (67.74%) patients were males while 20 (32.26%) were females with mean age of 35.38±11.84 years. In group B 40 (64.52%) and 22 (35.48%) patients were males and females with mean age 36.02±10.96 years. No significant difference was observed regarding degree of hemorrhoids between both groups ( $p>0.05$ ). Patients received placebo (group B) had high rate of wound infection found in 29 (46.77%) patients as compared to patients who received 0.2% GTN 10 (11.29%), the difference was statistically significant ( $p=0.001$ ).

**Conclusion:** 0.2% glyceryl trinitrate ointment is effective for the prophylaxis of wound infection in patients undergoing milligan morgan hemorrhoidectomy.

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

## INTRODUCTION

Hemorrhoids are a distension of the normal haemorrhoidal vascular cushions[1]. In both sexes, it is equally normal [2]. The most frequently done treatment for this disorder is Milligan-Morgan haemorrhoidectomy[3]. It is known as a reasonably safe operation, although there are risks such as post-operative pain and slow wound healing. It is associated with major postoperative pain and patients have to wait a long time to resume work[4].

The hemorrhoidectomy wound lies in a region where it is difficult to apply proper surgical dressings. In addition, the contamination of the wound site by defecation includes continuous cleaning of the area after each defecation using hot seat baths. This leads to a pause in the healing of wounds and pain after defecation, thereby increasing the time needed for regular work to resume. Glyceryl trinitrate (GTN) topical application decreases anal canal pressure, enhances anodermal blood flow[5], and thus increases wound healing rates. Perianal administration of 0.2% GTN ointment substantially decreases postoperative pain after hemorrhoidectomy compared with placebo and reduces analgesic requirements throughout the immediate postoperative period. Glyceryl trinitrate ointment often achieves faster wound healing[6].

Glyceryl trinitrate after haemorrhoidectomy topical use can decrease spasm and postoperative pain, while improved anodermal blood flow can speed up wound healing[7]. Nitroglycerin benefits can be limited by

headaches and the resulting need for non-narcotic medications[8]. GTN, as well as other anal spasmolytic agents, have also been shown to be helpful in reducing postoperative pain and healing time after open hemorrhoidectomy[9-10].

The present study was conducted aimed to determine the effectiveness of topical 0.2% GTN for wound healing after hemorrhoidectomy.

## MATERIAL AND METHODS

This randomized controlled trial was conducted for a duration of six months at department of surgery Khairpur Medical College (KMC) Hospital, Khairpur Mirs, during the period from January 2019 to June 2019. Total 124 patients of both genders undergoing hemorrhoidectomy were enrolled in this study. Patients ages were ranging from 20 to 65 years. Detailed demographics including age, sex, BMI and degree of hemorrhoids were recorded after taking written consent. An exclusion criterion was patients with diabetic mellitus, emergency hemorrhoidectomy, renal failure patients and those with no consent.

All the patients had received elective Milligan-Morgan hemorrhoidectomy under general anesthesia. All the patients were categorized into two equal groups. Group A with 62 patients received 0.2% of topical glyceryl trinitrate ointment and Group B received placebo. Group A patients advised to use of 0.2% topical glyceryl trinitrate ointment three times a day and Group II was advised to use placebo

for 3 weeks postoperatively. Postoperative wound infection was examined at 3 weeks postoperatively. Compared the wound infection rate between both groups. All the data was analyzed by SPSS 24.0. Mean $\pm$ SD was done. Chi-square test was done to compare the frequency of wound infection between both groups. P-value <0.05 was taken as significant.

## RESULTS

In group A, 42 (67.74%) patients were males while 20 (32.26%) were females with mean age of 35.38 $\pm$ 11.84 years. In group B 40 (64.52%) and 22 (35.48%) patients were males and females with mean age 36.02 $\pm$ 10.96 years. Mean BMI of group A patients was 25.36 $\pm$ 2.44 kg/m<sup>2</sup>, and in group B it was 25.03 $\pm$ 2.12 kg/m<sup>2</sup>. In group A and B 37 (59.68%) and 40 (64.52%) patients had 3<sup>rd</sup> degree hemorrhoids while 25 (40.32%) and 22 (35.48%) had 4<sup>th</sup> degree hemorrhoids (Table 1)

Table 1: Baseline details of all the patients.

| Variables             | Group A (GTN)     | Group B (Placebo) |
|-----------------------|-------------------|-------------------|
| Mean Age (yrs)        | 35.38 $\pm$ 11.84 | 36.02 $\pm$ 10.96 |
| Mean BMI (kg/m)       | 8 (14.55%)        | 30 (54.55%)       |
| Gender                |                   |                   |
| Male                  | 42 (67.74%)       | 40 (64.52%)       |
| Female                | 20 (32.26%)       | 22 (35.48%)       |
| Degree of Hemorrhoids |                   |                   |
| III                   | 37 (59.68%)       | 40 (64.52%)       |
| IV                    | 25 (40.32%)       | 22 (35.48%)       |

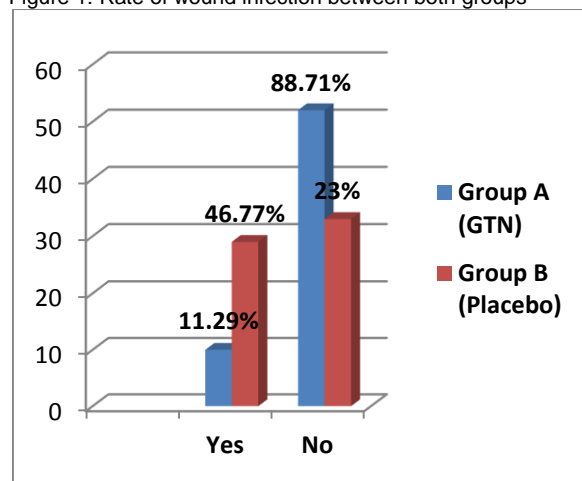
P-value >0.05

At postoperative follow-up, Patients received placebo (group B) had high rate of wound infection found in 29 (46.77%) patients as compared to patients who received 0.2% GTN 10 (11.29%), the difference was statistically significant (p=0.001). (Figure 1)

Table 2: Comparison of wound infection between both groups

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

Figure 1: Rate of wound infection between both groups



## DISCUSSION

One of the most commonly performed surgical procedures in the world is haemorrhoidectomy. The most frequently found complication is post-operative complications such as wound infection and pain, which are associated with poor quality of life and adverse outcomes [11]. The current research was conducted to determine the efficacy of topical 0.2% GTN for postoperative wound healing in milligan morgan hemorrhoidectomy patients. In this regard 124 patients with 3<sup>rd</sup> or 4<sup>th</sup> degree hemorrhoids were enrolled. Majority of patients were males 66.13% as compared to females 33.87%. Overall average age was 36 years. These results were comparable to some previous studies in which males were predominant 60 to 70% as compared to females and majority of patients were ages between 30 to 45 years [12-13]. No significant difference was observed regarding degree of hemorrhoids between both groups (p=>0.05). A study by Hyder Z et al [14] reported that 59.67% patients had 3<sup>rd</sup> degree and 40.32% had 4<sup>th</sup> degree hemorrhoidal disease.

In present study we found that Patients received placebo (group B) had high rate of wound infection found in 29 (46.77%) patients as compared to patients who received 0.2% GTN 10 (11.29%), the difference was statistically significant (p=<0.001). A study conducted by Sultani S et al [15] demonstrated that patients received topical GTN had lower rate of wound infection as compared to placebo with p-value <0.05. A meta-analysis of 333 patients by K. Ratnasingham et al [16] reported that after 3 weeks of hemorrhoidectomy patients who received topical GTN had significantly high rate of wound healing as compared to placebo.

Khan et al [17] 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 DY et al [18] 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%.

In present study we found that topical GTN was also effective in reducing postoperative pain as compared to placebo and these results showed similarity to some previous studies [19-20].

## CONCLUSION

We concluded that 0.2% glyceryl trinitrate ointment is effective for the wound healing in patients undergoing milligan morgan hemorrhoidectomy.

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