

Original Research Article

AN EXPERIMENTAL STUDY TO EVALUATE THE PERIOPERATIVE COMPLICATIONS OF MANUAL SHAVING VERSUS DEPILATION CREAM IN PREOPERATIVE PREPARATION

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ABSTRACT

Background: Preoperative hair removal is commonly performed to facilitate surgical exposure and skin preparation; however, the optimal method remains debated. Manual razor shaving may cause cutaneous trauma, whereas depilatory creams offer chemical hair removal but may produce local skin reactions. This study compared perioperative complications associated with depilatory cream and manual shaving during preoperative preparation.

Materials and Methods: A prospective randomized comparative study was conducted among 100 male patients aged 18–65 years undergoing elective clean or clean-contaminated surgery at a tertiary-care rural hospital in Central India. Participants were randomized into two equal groups: depilatory cream (n=50) and manual razor shaving (n=50). Hair removal was performed approximately 12 hours before surgery. Adequacy of hair removal, skin injuries, local skin reactions, surgical-site infection (SSI), seroma, and duration of hospital stay were assessed during postoperative follow-up.

Results: The findings revealed that, complete hair removal was achieved more frequently with depilatory cream than manual shaving (88% vs 60%). No skin injury occurred in the depilatory cream group compared with 28% in the shaving group (P=0.001). On the other hand, local skin reactions were more frequent with depilatory cream (16% vs 2%; P=0.014). SSI occurred in 2% of patients in the depilatory cream group compared with 8% in the shaving group. Seroma occurred in 2% vs 8%, respectively. Mean hospital stay was shorter with depilatory cream (3.24 ± 0.95 vs 3.92 ± 0.56 days).

Conclusion: Depilatory cream provided more effective hair removal and substantially reduced mechanical skin injury compared with manual shaving, although it was associated with more local skin reactions. When hair removal is considered necessary, depilatory cream may represent a useful alternative to manual shaving, particularly when preservation of skin integrity is a priority.

Keywords: Preoperative hair removal, Depilatory cream, Manual shaving, Surgical-site infection, Perioperative complications.

INTRODUCTION

Preoperative preparation of the surgical site is a fundamental component of perioperative care and traditionally includes hair removal to facilitate

surgical exposure and skin preparation.^[1] Surgical-site infection (SSI) remains one of the most frequently encountered postoperative complications, with reported incidence rates ranging from 2.1% to 7%.^[2,3] Various methods of preoperative hair removal, including shaving, clipping, and depilatory

creams, are used in clinical practice, with differing effects on skin integrity and postoperative outcomes.^[4,5]

The increased susceptibility to SSI associated with certain techniques stems primarily from localized skin trauma induced during the preparation process. Razor shaving can produce microscopic cuts and abrasions that disrupt the skin barrier, providing potential sites for microbial colonization and subsequent infection.^[6,7] In contrast, depilatory cream provides a non-mechanical approach by chemically disrupting keratin within the hair shaft, allowing hair removal without direct laceration or abrasion of the skin. However, chemical depilation may cause local complications such as erythema, irritation, or hypersensitivity, particularly at sensitive anatomical sites.^[6,7]

A network meta-analysis of randomized controlled trials reported a lower risk of SSI with chemical depilation compared with shaving,^[8] while the updated Cochrane review found that depilatory cream probably results in fewer SSIs and skin complications than razor shaving.^[1] Nevertheless, the evidence remains heterogeneous, and contemporary recommendations emphasize avoiding unnecessary hair removal and discouraging razor shaving when removal is required.

Despite this evidence, manual shaving remains widely practiced because of its simplicity, accessibility, and low cost. Importantly, existing research has focused predominantly on SSI, whereas comparative evidence concerning the broader range of perioperative complications associated with different hair-removal techniques remains limited. In light of these evidences, the present study aims to evaluate and compare the perioperative complications associated with manual shaving and depilatory cream during preoperative preparation.

MATERIALS AND METHODS

This was a prospective randomized comparative study conducted in the Department of General Surgery at a teaching tertiary-care rural hospital in Central India. The study was conducted from November 2019 to November 2021. The study included adult male patients aged 18–65 years who were scheduled to undergo elective clean or clean-contaminated surgical procedures during the study period.

Eligibility Criteria

Inclusion Criteria

The study included patients who were male, aged 18–65 years, scheduled for elective surgical procedures, had a body mass index (BMI) of 18–35 kg/m², and provided written informed consent to participate in the study.

Exclusion Criteria

Patients were excluded if they had a known allergy or hypersensitivity to depilatory creams, clinically sensitive or compromised skin, an open wound at

the proposed operative site, or were receiving active chemotherapy.

A total of 100 eligible patients were enrolled in the study after obtaining written informed consent. Participants were randomly allocated into two groups to minimize selection bias. Group A comprised patients undergoing preoperative hair removal with depilatory cream, whereas Group B comprised patients undergoing manual razor shaving.

- Group A: Depilatory cream (n = 50)
- Group B: Manual razor shaving (n = 50)

Preoperative Hair Removal

Preoperative hair removal was performed approximately 12 hours before surgery in both groups. Before the procedure, the intended operative site was examined for pre-existing cuts, abrasions, open wounds, or other skin abnormalities. The planned incision site was identified, patient privacy was ensured, and consent for the hair-removal procedure was confirmed.

Depilatory Cream Group

In Group A, depilatory cream was applied evenly as a thick layer over the designated operative area. The cream was allowed to remain in contact with the hair for approximately 10 minutes. A small area was initially assessed to determine the adequacy of hair removal and to identify any immediate skin reaction. Once adequate hair removal was achieved, the cream was removed using a damp cloth with firm strokes in the direction of hair growth, followed by thorough rinsing of the treated area.

The cream was not applied over cuts, abrasions, open wounds, or mucosal surfaces. The operative field was subsequently inspected for erythema, irritation, hypersensitivity, or other local skin reactions.

Manual Shaving Group

In Group B, hair was removed manually using a razor over the designated operative field. Shaving was performed in the direction of hair growth, with care taken to minimize skin trauma. Following hair removal, the operative site was inspected for cuts, abrasions, bleeding, erythema, or other visible skin reactions.

Assessment of the Operative Site

Following hair removal and before surgery, the operative site was assessed for the adequacy of hair removal and the presence of local skin complications. These included cuts, abrasions, erythema, irritation, bleeding, and other clinically apparent skin reactions.

Postoperative Follow-up

Patients were assessed postoperatively on the 3rd, 5th, and 7th postoperative days for wound-related complications. A further follow-up assessment was performed on the 30th postoperative day. Patients who did not attend the scheduled 30-day follow-up were contacted telephonically.

Statistical Analysis: The collected data were entered into Microsoft Excel and analyzed using

IBM SPSS Statistics version 20.0. Continuous variables were expressed as mean $\pm$ standard deviation (SD), while categorical variables were presented as frequencies and percentages. Categorical variables were compared between the depilatory cream and manual shaving groups using the chi-square test. A two-sided P value <0.05 was considered statistically significant.

RESULTS

The mean age was 42.56 ± 13.91 years in the depilatory cream group and 40.12 ± 13.21 years in the manual shaving group, with no significant difference ($\chi^2=3.52$, $p=0.47$). The mean hospital stay was 3.24 ± 0.95 and 3.92 ± 0.56 days, respectively, showing a statistically significant difference ($\chi^2=72.63$, $p=0.0001$).

Table 1: Comparison of Postoperative Complications Between the Depilatory Cream and Manual Shaving Groups

Complication	Category	Depilatory Cream (n=50)	Manual Shaving (n=50)	Total (N=100)	χ^2 value	p-value
Seroma	Present	1 (2%)	4 (8%)	5 (5%)	1.89	0.16, NS
	Absent	49 (98%)	46 (92%)	95 (95%)		
Hematoma	Present	0 (0%)	0 (0%)	0 (0%)	—	—
	Absent	50 (100%)	50 (100%)	100 (100%)		
Edema	Present	0 (0%)	0 (0%)	0 (0%)	—	—
	Absent	50 (100%)	50 (100%)	100 (100%)		
Surgical site infection	Present	1 (2%)	4 (8%)	5 (5%)	1.89	0.16, NS
	Absent	49 (98%)	46 (92%)	95 (95%)		

Seroma occurred in 2% of the depilatory cream group and 8% of the manual shaving group, with no significant difference ($\chi^2=1.89$, $p=0.16$). No cases of hematoma or edema were observed. Surgical site infection occurred in 2% and 8% of the respective groups, with no significant difference ($\chi^2=1.89$, $p=0.16$). [Table 1]

Complete hair removal was achieved in 88% of patients in the depilatory cream group compared with 60% in the manual shaving group. The difference was statistically significant ($\chi^2=11.19$, $p=0.0037$). [Figure 1]

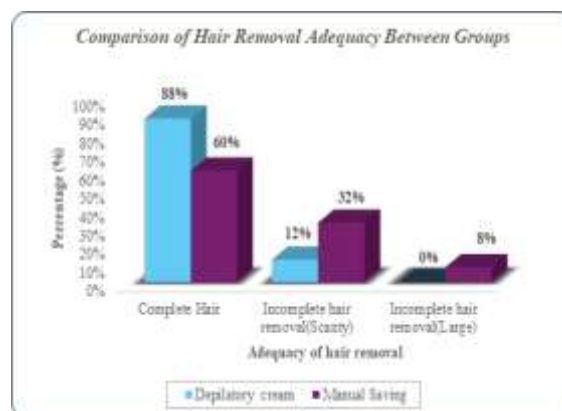


Figure 1: Comparison of Hair Removal Adequacy Between the Two Groups

Table 2: Comparison of Skin Injuries Between the Depilatory Cream and Manual Shaving Groups

Category	Depilatory Cream (n=50)	Manual Shaving (n=50)	Total (N=100)	χ^2 value	p-value
No injury	50 (100%)	36 (72%)	86 (86%)	16.28	0.001, S
Single tiny injury	0 (0%)	7 (14%)	7 (7%)		
Multiple small injury	0 (0%)	6 (12%)	6 (6%)		
Large injury	0 (0%)	1 (2%)	1 (1%)		

No skin injury was observed in the depilatory cream group, compared with 28% of patients in the manual

shaving group. The difference was statistically significant ($\chi^2=16.28$, $p=0.001$). [Table 2]

Table 3: Comparison of Skin Reactions Between the Depilatory Cream and Manual Shaving Groups

Category	Depilatory Cream (n=50)	Manual Shaving (n=50)	Total (N=100)	χ^2 value	p-value
No reaction	42 (84%)	49 (98%)	91 (91%)	5.97	0.014, S
Reaction	8 (16%)	1 (2%)	9 (9%)		

Skin reactions occurred in 16% of patients in the depilatory cream group compared with 2% in the manual shaving group. The difference was statistically significant ($\chi^2=5.97$, $p=0.014$). [Table 3]

DISCUSSION

The preoperative hair removal to prevent interference of hair with skin incision and wound

closure, to avoid hair falling into the wound, and to facilitate application of adhesive drapes and wound dressings. Therefore, the effectiveness of hair removal in achieving complete hair clearance is an important consideration in selecting the appropriate technique.^[8,1]

In present study significantly higher adequacy of hair removal with depilatory cream is consistent with Adisa et al,^[9] who reported complete hair

removal in 88.6% of patients using depilatory cream compared with 61.6% following razor shaving, closely paralleling our findings of 88% and 60%, respectively. Okoli et al,^[10] similarly reported complete hair removal in 94% of the depilatory group compared with 76% of the shaving group. These findings consistently favour depilatory cream for achieving more complete hair removal.

No skin injury was observed in the depilatory cream group in the present study, compared with 28% in the manual shaving group. This finding is comparable with Adisa et al,^[9] who reported skin injuries in 3.8% of patients using depilatory cream compared with 27.9% following razor shaving. Okoli et al,^[10] reported skin injury in 2% of the depilatory group compared with 42% of the shaving group. These findings support the lower risk of mechanical skin trauma associated with chemical depilation.

In contrast, skin reactions were more frequent with depilatory cream in the present study (16% vs 2%). This finding underscores an important limitation of chemical depilation, as depilatory agents may cause local irritation or erythematous reactions. Sah et al,^[11] similarly reported skin reactions in 17.8% of patients in the depilatory-cream group compared with 5.9% in the razor group.

The incidence of SSI in the present study was 2% with depilatory cream and 8% with manual shaving. This finding was comparable with Adisa et al,^[9] who reported SSI rates of 2.5% and 12.8%, respectively. Okoli et al,^[10] also reported lower SSI with depilatory cream (14% vs 22%).

Seroma occurred in 2% of patients in the depilatory cream group and 8% in the manual shaving group. As previous studies have predominantly focused on SSI and skin injury, evidence regarding seroma and other postoperative complications following different hair-removal techniques remains limited. No cases of hematoma or edema were observed in either group.

The present study also demonstrated a shorter hospital stay in the depilatory cream group (3.24 ± 0.95 vs 3.92 ± 0.56 days). However, direct comparison with previous studies is difficult because hospital stay has not been consistently evaluated as an outcome of preoperative hair-removal techniques.

The findings of the present study are also consistent with previous comparative evidence. Karegoudar et al,^[12] reported that chemical depilation was atraumatic and offered practical advantages in areas where shaving was difficult. Suvera et al,^[13] similarly reported complete hair removal in 91% of patients using depilatory cream compared with 62% following razor shaving, while skin injuries occurred in 4% and 29%, respectively. These findings closely parallel the present study and further support the use of depilatory cream when preoperative hair removal is considered necessary. Collectively, the present study demonstrates a trade-off between the two techniques; depilatory cream

provided more complete hair removal and substantially reduced mechanical skin injury, whereas manual shaving was associated with fewer skin reactions. These findings suggest that depilatory cream may be a useful alternative to manual shaving when preoperative hair removal is considered necessary, particularly when minimizing skin trauma.

The study has several limitations; the study was conducted at a single tertiary-care center with a relatively small sample size and included only male patients, which may limit the generalizability of the findings. In addition, the low number of postoperative infectious events limits the ability to draw definitive conclusions regarding differences in SSI between the two techniques. Larger, multicentre studies involving a more diverse patient population are warranted to validate these findings.

CONCLUSION

The findings of the study concluded that, the depilatory cream demonstrated greater adequacy of preoperative hair removal and substantially fewer skin injuries than manual razor shaving. However, local skin reactions were more frequent following depilatory cream, indicating a potential trade-off between reduced mechanical trauma and chemical skin irritation. Although surgical-site infection and seroma were less frequent in the depilatory cream group, the differences were not statistically significant. Overall, when preoperative hair removal is considered necessary, depilatory cream may be a safer alternative to manual shaving, particularly in terms of achieving adequate hair removal while minimizing mechanical skin injury. Further multicentre studies with larger sample sizes are warranted to establish whether these differences translate into clinically meaningful reductions in postoperative complications.

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