



## COMPARISON BETWEEN THREE METHODS OF HAIR REMOVAL AND THEIR EFFECT ON SURGICAL SITE INFECTIONS

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Conflicts of Interest: Nil

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### Abstract:

**Background:** Preparation of surgical site may include the use of Shaving or clipping or use of depilatory creams as methods for hair removal, assessment of these three and their effect on surgical site infections.

**Methods:** A total of 90 patients were randomised and were chosen who underwent elective uncontaminated abdominal surgeries. These patients were randomly assigned to one of the three methods of hair removal in 1:1:1 ratio. Primary end points were patient comfort, pain, adequacy of hair removal and post operative infections.

**Results:** Most of the patients found that the depilatory creams (70%) were comfortable and did not cause much pain while using. Post operative infections were least on usage of the depilatory creams (6%).

**Conclusion:** Depilatory creams are known to significantly reduce the post operative infections, with cost and hypersensitivity on the negative end.

**Keywords:** Clipping, Depilatory cream, Shaving, Surgical site infection.

### I. Introduction:

With the development in the aseptic precautions in the field of surgery, patients undergoing surgery have hair removed from the site of the incision, as it is thought to reduce the chance of the surgical site becoming infected. Hair is removed by several different methods which include shaving, clipping the hair and using a chemical creams. Hair is also thought to be associated with a lack of cleanliness and the removal of hair is thought to reduce the risk of surgical site infections.<sup>[1]</sup>

Surgical site infections occur in the wound after surgical procedure, and have a detrimental effect on patients' treatment. Surgical site infection is defined as infection which occurs within 30 days of surgery, exudes pus, swabs positive for organisms and shows one of the following symptoms: pain, localised swelling, redness or heat. Hence, an appropriate method for removing hair from the incision site pre-operatively can be essential to avoid post operative infections among surgical patients.<sup>[2]</sup>

Three methods of hair removal are currently used; shaving, clipping and chemical depilation. Shaving is the commonest and cheapest method of hair

removal. This method uses a sharp blade, held within the head of a razor, which is drawn over the patient's skin to cut hair close to the surface of the skin. Clippers use fine teeth to cut hair close to the patient's skin, leaving a short stubble of usually around one millimetre in length. The heads of clippers can be disposed of or disinfected between patients to minimise the risks of cross infection. Depilatory creams are chemicals which dissolve the hair itself. This is a slower process than either shaving or clipping as the cream has to remain in contact with the hair for between 5 and 20 minutes. In addition there is a risk of irritant or allergic reactions to the cream and patch tests should be carried out 24 hours before the cream is applied. Shaving and clipping can be carried out in operating theatres, anaesthetic rooms, wards or in peoples homes by theatre staff, ward staff, or by patients themselves. Chemical depilation is usually carried out on wards or in the home as it requires more time. During the process of shaving, the skin may experience microscopic cuts and abrasions. It is believed that microorganisms can enter and colonise these cuts and contaminate the surgical wound causing post-operative wound infections. In addition abrasions may ooze exudates, which may provide a culture medium for

microorganisms . Since clippers do not come into contact with the patient’s skin they are thought to reduce the risk of cuts and abrasions.<sup>[3-5,7]</sup>

Having a hairless surgical site may ease surgery, the application of dressings and reduce potential infection as hair is a source of bacteria, but the process of removing hair might cause primary infection because of microscopic cuts to the skin.<sup>[2]</sup> This following study will assess the relative benefits and harms of hair removal, the different methods of hair removal, and the effect of timing.

**II. Material and Methodology:**

The study was conducted at SMCH during March 2019 to July 2019. Institutional ethics committee approved the study protocol and informed consent was obtained from all study participants.

All the patients both male and female between the ages of 20-60 years in the surgery ward undergoing elective uncomplicated, uninfected abdominal surgeries were included. Those not willing to participate in the study and those who are undergoing complicated surgeries, age less than 20 years and greater than 60 years were excluded from the study. The patients were assigned to one of the three techniques by randomization in 1:1:1 ratio with each of the group having 30 patients each. The patients were allowed to express their concern of the cost, comfort and pain, whereas the adequacy of the hair removal and the post operative infections were assessed by the surgeon.

The time of the hair removal before the operation was the same in all the three categories of the patients, which was on the same day and about 5 hours prior to the surgery. The time taken for the hair removal was calculated from the initiation of hair removal to its completion.

The adequacy of hair removal was noted and the postoperative inspection and follow up for the patients of the 3<sup>rd</sup> and the 5<sup>th</sup> days was also done.

**Grading of hair removal**

The hair removal was assessed on whether it was poor, partial, or complete.<sup>[9]</sup>

Poor- inadequate hair removal with hair and stumps of hair in the surgical site.

Partial- only short stumps of hair in the surgical site.

Complete- clear surgical site without any hair.

**Pain**

The Numeric Rating Scale (NRS-11) is an 11-point scale for patient self-reporting of pain.

**Table 1:**

Rating	Pain level
0	No pain
1-3	Mild pain (nagging, annoying, little interference with daily activities)
4-6	Moderate pain (interferes with the daily activities)
7-10	Severe pain (disabling, not able to perform daily activities)

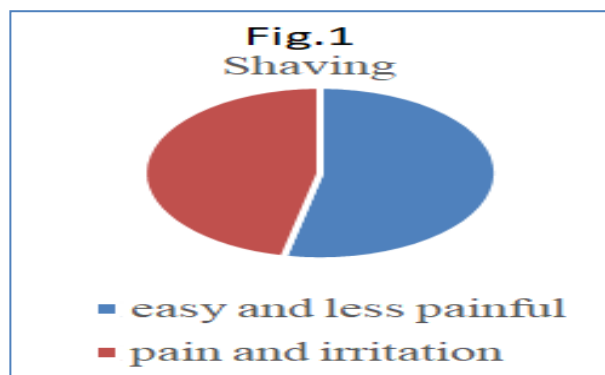
**Surgical site infection**

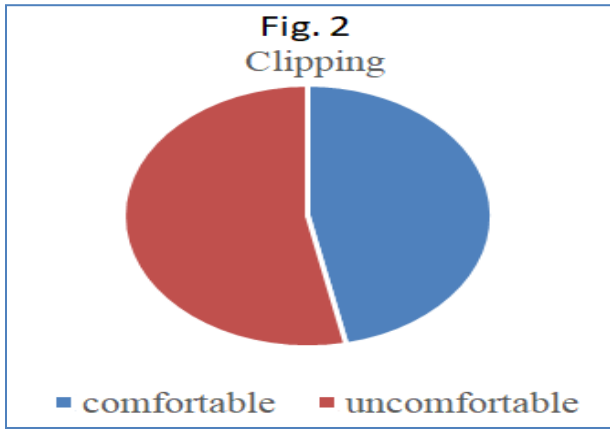
A modification of the Southampton wound infection scoring system was employed for grading infections when present. Grade I wound infection was taken as presence of undue wound redness and swelling, Grade II as discharge of serous or serosanguinous fluids from the surgical wound, Grade III as discharge of pus from the wound, and Grade IV as discharge of pus and wound dehiscence.

**III. Result:**

A total of 90 patients were analysed out of which there were 54 male patients and 36 female patients, who were randomly allocated to shaving (n=30), clipping (n=30) and depilatory creams(n=30).

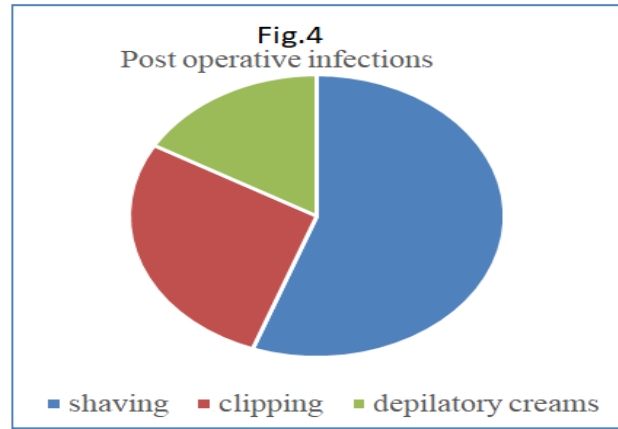
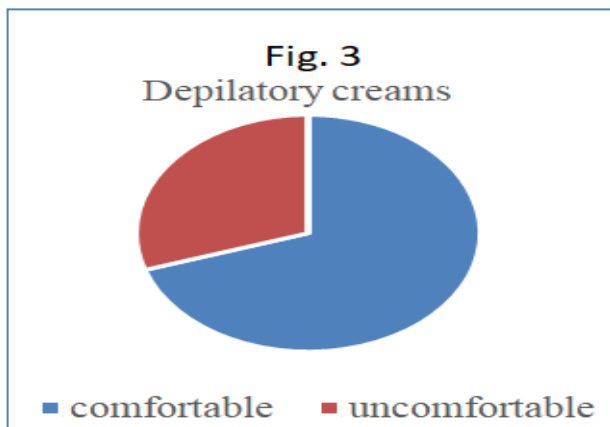
Among the 30 patients who underwent shaving as a preoperative method of hair removal 16 patients (53.3%) found it easier and less painful, where as 14 patients(46.6%) had micro abrasions that caused pain and irritation. 6 patients(20%) had post operative infections following this method. The adequacy of hair removal in this was said to be complete for most of the patients. Time of the hair removal was quicker when compared to the other two methods with the average time being 6-8 mins.





Among those who used clipping as a method of hair removal, 14 patients (46.6%) said it was beneficial with minimal pain whereas 16 patients (53.3%) said that it was uncomfortable. Post operative infection was noted in 3 patients out of 30 (10%). The adequacy of hair removal was poor (unsatisfactory) as clipping involved the presence of a small stump of the hair that was left behind in majority of the patients chosen. The cost was minimal, and the clippers could be reused after proper sterilization. The time required to do clipping was slightly greater than that of the shaving but it was lesser compared to the use of depilatory creams, the average time being 10-12 mins.

9 patients (30%) rated that depilatory cream was uncomfortable while the rest 21 patients (70%) told that this was easy to use and at the same time was free of any abrasions. In 2 patients (6%) postoperative infections were noted, and around 4 patients (13%) developed sensitivity reactions to this. The grading of hair removal was mostly complete. Each of the patient required approximately 15- 20 mins for the entire procedure which shows that this was one of the most time consuming procedures among all the three methods.



Degree of Hair removal	Hair removal method		
	Razor	Depilation	Clipping
Poor	5	19	0
Partial	0	8	2
Complete	25	2	28

**IV. Discussion:**

From the above attained results it is clear that the patient response is positive towards the depilatory creams(70%), owing to the ease in usage and clean surgical site. It can also be analysed from the above that the surgical site infections were lesser with depilatory creams (6%) and greater in the cases where shaving (20%) due to the increased micro aberrations, that facilitated the easy growth of bacteria. And the next highest SSI with clipping due to the stump of hair that was left behind that served as the nidus of infection. The time required for depilation and clipping was more when compared to shaving.

In a study conducted in Obafemi Awolowo University, A total of 165 patients were studied. A significant association was found between preoperative skin injuries and postoperative wound infections. Preoperative hair removal with razor shaving predisposes to skin injuries which in turn significantly influence postoperative wound infection rates. Such injuries and resultant wound infection are fewer when depilatory cream is used for hair removal.<sup>[3]</sup>

A study by Mukesh Suvera, Department of General Surgery, Smt. NHL Municipal Medical College, Ahmedabad, Gujarat, India total 215 patients were employed and it was seen that There was no any association seen between skin reaction and hair removal methods. However post-operative wound

infection was significantly associated with razor than cream.<sup>[4]</sup>

According to the study by Al Maqbali, in Oman states that it is necessary to remove hair preoperatively, and this can be done with the help of the clippers and the depilatory creams, these significantly reduce the surgical site infections. The use of razors predisposes the patient to surgical site infections.<sup>[5]</sup>

#### V. Conclusion:

The depilatory creams have a significant importance in reducing the post operative wound infections, with hypersensitivity reactions and is considered as a better method among the other two methods of hair removal.

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