Pre-Operative Depilatory Cream Hair Removal to Reduce Surgical Site Infection in Patients Undergoing Elective Surgery

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Abstract

Surgical site infection (SSI) is a significant cause of morbidity, mortality, and increased hospital stay time and costs after the operation. This paper aimed to review studies that explored the potential effectiveness of using depilatory cream to decrease the occurrence rate of surgical site infections as early preparation of cleaning area of the postoperative wound incision. An electronic search was carried out using PubMed and Google Scholar data bases. This review showed that there is a little amount of evidence on the effectiveness of using chemical hair removal with patients undergoing elective surgeries to decrease the risk of surgical site infections. Depilation before surgery has been used as a procedure to prevent hair from interacting with the recovering wound area. For preoperative surgical site hair removal, shaving, clipping, and chemical depilation are performed in hospitals. Chemical depilation requires adding a hair removal cream to the skin to remove the hair, and when this approach is used for hair removal, it is suggested that injuries and subsequent wound infection will be less. It is highly recommended that further studies need to be conducted to deeply investigate this area of interest.

***Keywords**: Surgical Site Infection, Skin Preparation, Depilation, Hair Removal.*

Introduction

The regular elimination of body hair from the planned surgical wound site has been historically involved in the preparation of patients for surgery. Hair is thought to be associated with unhygienic conditions, and hair removal is supposed to mitigate the chances of Surgical Site Infections (SSIs) [(1)]. On the other hand, reports suggested that pre-operative depilation is harmful to patients, likely causing SSIs and therefore should not be conducted out [(2)]. in United Kingdom (UK) approximately 10 percent of patient's experience SSIs per year which can lead to delay in wound healing, prolonged hospitalization, excessive pain, and in severe cases, patient death [(2)].

One of the antiseptic steps implemented by surgeons to prevent surgical wound infection is preoperative depilation. The most popular hair removal techniques used are razor blade shaving, clipping, and the use of depilatory creams [(3)]. In developing countries, they use the oldest hair removal technique; the razor blade shaving is the most generally practiced and this is frequently accompanied by varying degrees of skin injuries and eventual contamination of the surgical site. While, the newer methods of clipping or using depilatory cream have not been practiced by many of these countries. This

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is due to the low expense of the razor blade, simplicity of use, and the inability of health facilities to implement modern hair removal techniques [4].

The Centers for Disease Control and Prevention (CDC) emphasize that the major aspects in preventing surgical sits infections, which include educating and training health care workers to use best practice to prevent SSIs [5,6]. There is scarcity in the literature regarding the different types of hair removal in terms of their effects on SSIs. In Jordan, few studies have been conducted regarding prevention practices guidelines commitment among healthcare workers [7-11]

This review explored the potential effectiveness of using depilatory cream to decrease the occurrence rate of surgical site infections as early preparation of cleaning area of the postoperative wound incision, which is an important characteristic of the safe recovery process without infections.

Method

Search Methods: The electronic searching was conducted in PubMed and Google Scholar. Key search terms used: surgical site infection, skin preparation, chemical depilation, hair removal.

The studies that focused on the topic of the effect of type of preoperative depilation on SSI among adult patients requiring clean surgeries through a hair-bearing area, were published in English between 2015 and 2020 were included in the review. While, studies published before 2015 were excluded.

Search outcome: Exploring of literature yield about 30 studies for review, after reading the studies about 20 study were excluded and 10 studies met the inclusion criteria.

Discussion

An uneventful postoperative healing and early return to preoperative status is the target of any surgeon after a successful operation. The SSI is one of the most prevalent surgical complications and puts a major burden on patients and the health care system, even with the many antiseptic steps which have been taken by physicians to prevent SSI [4]. The SSI is a significant cause of morbidity and prolonged postoperative hospitalization and is expensive for hospitals [12]. To avoid SSI or to prevent hair from overlapping with the incision site, preoperative hair removal is being performed in most of the hospitals [2]. For surgical site hair removal, three approaches have been used widely: shaving, clipping, and chemical depilation. Shaving requires removing the hair with a razor near to the skin's surface. Clipping involves removing the hair to leave ~1 mm of hair usually with electric clippers. To dissolve the hair, chemical depilation includes applying a hair removal cream on the skin [12].

Having a shaven surgical site can facilitate surgery, dressing and decrease possible infection, as the hair is a source of bacteria, but the hair removal process can induce primary infection due to microscopic injuries in the skin [2]. The skin can suffer microscopic cuts and abrasions during the procedure of shaving. Micro-organisms are thought to be able to penetrate and colonize these wounds, thereby contaminating the site of the surgical incision and inducing SSIs. Additionally, abrasions can exude body fluids, which supplies micro-organisms with a growth media. Since chemical depilatory creams do not come into contact with the skin of the patient, the probability of cuts and abrasions is considered to be decreased [2].

The depilation before surgery has been investigated in many studies. A meta-analysis of randomized or quasi-randomized study was conducted to compare various depilation techniques. The present evidence indicated that there were fewer SSIs with clipping than with shaving when it was appropriate to remove hair. However, there were a scarcity of research papers that compared chemical hair removal with clipping [2]. In a developing nation where razor shaving is very common, a study examined the relationship between two techniques of preoperative depilation and surgical site infection. The study found that preoperative depilation with razor shaving is predisposed to skin conditions, which in turn significantly affects the rate of postoperative wound infection. When hair removal treatment is used, these wounds and the resulting wound infection would be less [13].

In a randomized prospective study performed on 100 patients who have undergone surgery, the study compared two forms of preoperative skin preparation:

51 patients were shaven and 49 were treated with a hair removal agent. They noticed that a suitable form of pre-operative skin preparation tends to be depilation with a chemical agent. It is easier than shaving, it can be administered on areas that are not readily accessible by razors, and can also be done by the patients themselves. Also, by replacing preoperative blade shaving with the use of hair removal cream, a decrease in surgical site infection rates has been recorded [4].

Shaving and clipping can be conducted by hospital personnel, ward staff, or by patients themselves in hospital settings, anesthesia rooms, clinics, or in people's houses. Chemical hair removal is typically done onwards or at the house, as more time is required [2,12]. Studies have indicated that depilation in the operating room should not take place as loose hair could pollute the sterile surgical area [2], and the professional workers should perform depilation to avoid abrasion wounds.

In Jordan, only few relevant data were found in the literature [14-19]. A study was performed in five hospitals in Jordan found that only 29.8 percent of surgeons remove patient hair in the surgery room, with 57.1 percent preferring clipping as a method of removing patient hair before operation. According to the study further training was required to avoid SSIs. [20]. The level of awareness of Jordanian nurses about evidence-based recommendations for SSI prevention was evaluated in another Jordanian study. The results indicated that thirty-six percent of the nurses reported that preoperative hair removal should occur just before the surgery, and 49 percent of the nurses reported that electrical clippers are preferred to cut the hair of the patient at or near the incision site. [21].

Throughout the world, various depilation strategies are encouraged. The CDC, for instance, strongly advises that hair should not be removed pre-operatively unless the hair interferes with the procedure at or near the wound area [22]. While, the Norwegian Centre for Health Technology Evaluation reported that it is not highly encouraged to avoid before surgery hair removal. The Norwegian Centre found that there is no clear evidence either in support of preoperative hair removal or against it. The British Hospital Infection Society Working Group indicated that it is appropriate to shave only the area to be incised and that shaving should always be avoided if possible [2,12,23].

Conclusion

There is a scarcity evidence on the effectiveness of using chemical hair removal with patients undergoing elective surgeries as method to decrease the risk of surgical site infections. When comparing chemical depilation with shaving and clipping, there is a consensus that shaving is associated with the highest incidence rate of infection. It is highly recommended that further studies need to be conducted to deeply investigate this area of interest.

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Ethical Clearance: Taken from Princess Salma Faculty of Nursing, AL al-Bayt University ethical committee.

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References

1. Kumar, K., J. Thomas, and C. Chan. "Cosmesis in Neurosurgery: Is the Bald Head Necessary to Avoid Postoperative Infection?" Annals of the Academy of Medicine Singapore 2002; 31:150–54.
2. Tanner, Judith, Peter Norrie, and Kate Melen. "Preoperative Hair Removal to Reduce Surgical Site Infection." Cochrane Database of Systematic Reviews 2011; 11.
3. Wilson, A. P. R., C. Gibbons, B. C. Reeves, B. Hodgson, M. Liu, D. Plummer, Zygmunt H. Krukowski, Julie Bruce, J. Wilson, and A. Pearson. "Surgical Wound Infection as a Performance Indicator: Agreement of Common Definitions of Wound Infection in 4773 Patients." Bmj 2004; 329:720.
4. Bala, N. A., and S. K. Obiano. "Evaluation of Preoperative Hair Removal and Its Relationship with Postoperative Wound Infection at a Tertiary Health Facility in North-Eastern Nigeria." American Scientific Research Journal for Engineering, Technology, and Sciences (ASRJETS) 2019; 62:68–83.
5. Esteve, F., M. Pujol, E. Limon, M. Saballs, M. J. Argerich, R. Verdaguer, R. Manez, X. Ariza, and F. Gudiol. "Bloodstream Infection Related to

Catheter Connections: A Prospective Trial of Two Connection Systems." Journal of Hospital Infection 2007; 67:30–34.

6. Septimus, Edward J., and Julia Moody. "Prevention of Device-Related Healthcare- Associated Infections." 2016; *F1000 Research* 5.
7. Suliman M, Saleh W, Al-Shiekh H, Taan W, AlBashtawy M. The incidence of peripheral intravenous catheter phlebitis and risk factors among pediatric patients. Journal of Pediatric Nursing 2019; 27:89-93.
8. Qudeimat, Muawia A., Razan Y. Farrah, and Arwa I. Owais. "Infection Control Knowledge and Practices among Dentists and Dental Nurses at a Jordanian University Teaching Center." American Journal of Infection Control 2006; 34:218–22.
9. ALBashtawy, M. Assessment of hand-washing among school students aged 6-18 years in Jordan. British journal of school nursing 2017; 12:30-36.
10. Suliman, M,. Aloush, S,. Aljezawi, M. & ALBashtawy, M. Knowledge and practices of isolation precautions among nurses in Jordan. American Journal of Infection Control 2017.
11. Aloush, S.M., Al-Sayaghi, K., Tubaishat, A., Dolansky, M., Abdelkader, F.A., Suliman, M., ALBashtawy, M., Halabi, M. Compliance of Middle Eastern hospitals with the central line associated bloodstream infection prevention guidelines. Applied Nursing Research 2018; 43:56-60.
12. Lefebvre, A., P. Saliou, J. C. Lucet, O. Mimoz, O. Keita-Perse, B. Grandbastien, F. Bruyere, P. Boisrenoult, D. Lepelletier, and L. S. Aho-Glele."Preoperative Hair Removal and Surgical Site Infections: Network Meta-Analysis of Randomized Controlled Trials." Journal of Hospital Infection 2015; 9100–108.
13. Adisa, Adewale Oluseye, Olukayode O. Lawal, and Olusanya Adejuyigbe. "Evaluation of Two Methods of Preoperative Hair Removal and Their Relationship to Postoperative Wound Infection." The Journal of Infection in Developing Countries 2011; 5:717–22.
14. ALBashtawy, M. & Hasna, F. Pediculosis capitis among primary school children in Mafraq Governorate, Jordan. Eastern Mediterranean Health Journal 2012; 18:43-48.
15. ALBashtawy, M. Head lice infestation in schoolchildren and related factors in Mafraq Governorate, Jordan. International Journal of Dermatology 2012; 51:168-172.
16. ALBashtawy, M. Knowledge, attitudes and practices of Parents /Guardians regarding pediculosis in the Umm el-Jmal District of Jordan. Journal of Research in Nursing 2014; 19:390-399.
17. ALBashtawy, M. Pediculosis in school sitting: what is the role of school nurses? Iranian journal of public health 2016; 46:1301-1302.
18. Al Kazaleh A., and AL Bashtawy. M. "Therapeutic Communication Skills in Nursing Education and Practice". EC Psychology and Psychiatry 2019; 8:01-04.
19. Alhamdoun, A., ALBashtawy, M., and Suliman. M. Managing Preoperative Anxiety among Patients Undergoing General Surgery. EC Psychology and Psychiatry 2020; 9:01-03.
20. Mater, Sara Ali. "Surgeon Practices and Attitudes toward the Control of Surgical-Site Infections in Jordan." 2014.
21. Qasem, Mahmoud N., and Issa M. Hweidi. "Jordanian Nurses' Knowledge of Preventing Surgical Site Infections in Acute Care Settings." Open Journal of Nursing 2017; 7:561.
22. Berríos-Torres, Sandra I., Craig A. Umscheid, Dale W. Bratzler, Brian Leas, Erin C. Stone, Rachel R. Kelz, Caroline E. Reinke, Sherry Morgan, Joseph S. Solomkin, and John E. Mazuski. "Centers for Disease Control and Prevention Guideline for the Prevention of Surgical Site Infection, 2017." JAMA Surgery 2017; 152:784–91.
23. Kowslski, Todd J., et al. " Impact of hair removal on surgical site infection rates: a prospectitve randomized noninferiority trial" Journal of the american college of surgeons 2016; 223:704-711.