

A Comparative Study Of Chlorhexidine-Alcohol Versus Povidone-Iodine For Surgical Site Antisepsis In Clean & Clean Contaminated Cases

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Abstract: Background: Surgical Site Infections are the third most commonly reported nosocomial infections all over the world. Despite the advances made in preoperative asepsis, patients subjected to operations naturally have to face the risk of complications due to infections. Patient's skin is a major source of pathogens that cause Surgical Site Infection

Materials and methods: Our study compares the efficacy of Chlorhexidene-Gluconate (2.5%) & Isopropyl Alcohol (63%) to Povidone-Iodine (5%) in preventing surgical site infections in 508 clean and clean contaminated cases. Patients were preoperatively evaluated which included Medical & Surgical history, Physical Examination, Routine hematologic and blood chemical laboratory tests. This study is conducted as a single blinded Randomised control trial.

Results: Our results showed that Surgical Site Infections are significantly less in Chlorhexidene-Alcohol group of patients than in Povidone-Iodine group (9.96% vs 15.95% $p < 0.05$).

Conclusion: Chlorhexidene - Alcohol is more efficacious than Povidone-Iodine in preventing Surgical Site Infections in Clean & Clean Contaminated Cases.

Keywords: Chlorhexidine-Alcohol, Povidone-iodine, Surgical Site infection

THESIS SUMMARY

Introduction:

Surgical Site Infections are the third most commonly reported nosocomial infections all over the world [1]. Despite the advances made in preoperative asepsis, patients subjected to operations naturally have to face the risk of complications due to infections. Patient's skin is a major source of pathogens that cause Surgical Site Infection. Povidone-Iodine (5%) is been used for preoperative skin preparation in surgeries since 1955 and is preferred universally. But even then a surgical site infection is a major complication it fails to control completely. Chlorhexidine has been widely used as oral antiseptic solution in mouth washes. Chlorhexidene-Alcohol with

its increased efficacy has been recently made available all over as an antiseptic and disinfectant [2]. This study compares the efficacy of Chlorhexidene-Gluconate (2.5%) & Isopropyl Alcohol (63%) to Povidone-Iodine (5%) in preventing surgical site infections in clean and clean contaminated cases.

Materials and methods:

This is a single blind prospective randomized controlled study conducted on 508 patients. Patients undergoing proposed clean & clean-contaminated surgery with no focus of infection on the body were admitted. The study included patients above

18 years of age, undergoing clean & clean-contaminated surgery in department of general surgery and orthopaedics. The study excluded patients with proposed Contaminated and Dirty wounds or patients with history of allergy to Chlorhexidene, Alcohol or Iodophores or evidence of infection at or adjacent to operative site or perceived inability to follow the patients' course for 30 days after surgery or for 1 year in case of implants and patients who did not give consent.

Results:

A total of 740 subjects were randomly assigned to a study group, 352 to the Chlorhexidine-alcohol group and 388 to

the Povidone–iodine group (Fig. 1). Of the 740 subjects who qualified for the analysis, 251 received Chlorhexidine–alcohol and 257 received Povidone–iodine. 232 subjects were excluded from the per protocol analysis: 57 underwent Class III (Contaminated) and Class IV (Dirty) rather than Clean and Clean-contaminated surgery. 175 subjects (76 in the Chlorhexidine–alcohol group and 99 in the Povidone–iodine group) did not complete follow-up protocol. Therefore, 508 subjects (251 in the Chlorhexidine–alcohol group and 257 in the Povidone–iodine group) were included in the per-protocol analyses. The subjects in the two study groups were similar with respect to demographic characteristics, coexisting illnesses, risk factors for infection, preoperative antimicrobial prophylaxis and duration and types of surgery.

Conclusion:

The infection rates observed in Chlorhexidine-alcohol and Povidone-iodine in present study were 9.96% and 15.95% respectively. This difference in infection rates is statistically significant. This proves the hypothesis that Chlorhexidine is superior to Povidone iodine. The superiority of Chlorhexidine alcohol can be attributed to its various properties such as Chlorhexidine leaves a protective film whereas Povidone-iodine leaves no film once rinsed off the skin leading to longer residual action. Presence of blood or serum protein does not alter Chlorhexidine-alcohol's bactericidal activity. Chlorhexidine-alcohol has rapid lethal action against both transient and resident flora, especially on anaerobic bacteria. Therefore it can be safely concluded that Chlorhexidine-alcohol can be used for preoperative skin preparation as an alternative to Povidone-iodine in clean and clean-contaminated surgeries. Since the superiority of Chlorhexidine-alcohol was proved in decreasing incision site colonization and postoperative wound infection, it would be prudent to use this regimen in contaminated and emergency surgeries as well.

Key Words:

Chlorhexidine-Alcohol, Povidone-iodine, Surgical Site infection.

Bibliography

1. N P Patel. "Antimicrobial Agents for Surgical Infections." *Surgical Clinics of North America* April 2009; 89: 365-90.
2. C F Brunickardi, "Surgical Infections." *Schwartz's Principles of Surgery*, McGraw Hill Company, 9th International edition, 2010p. 132-88.
3. R O Darouiche "Chlorhexidine-Alcohol versus Povidone-Iodine for Surgical-Site Antisepsis" *New England Journal of Medicine*; 36; 2010:218-26.
4. N Chaiyakunapruk. "Chlorhexidine compared with povidone-iodine solution for vascular catheter-site care: a meta-analysis". *Ann Intern Med*; 136, 2002:792-801.
5. L J Hayek. "A placebo-controlled trial of the effect of two preoperative baths or showers with Chlorhexidine detergent on postoperative wound infection rates." *J Hosp Infect. Sep*; 10(2); 1987:165-7
6. P J Culligan. "A randomized trial that compared povidone iodine and chlorhexidine as antiseptics for vaginal hysterectomy." *American Journal of Obstetrics and Gynecology*, Feb; 192(2); 2005: 422-25.
7. V Paocharoen. "Comparison of surgical wound infection after preoperative skin preparation with 4% chlorhexidine [correction of chlohexidine] and povidone iodine: a prospective randomized trial". *J Med Assoc Thai*; 92(7); 2009:898-902.
8. O Mimos. "Chlorhexidine-Based Antiseptic Solution vs Alcohol-Based Povidone-Iodine for Central Venous Catheter Care". *Evid Based Nurs*, 13:2010: 36-37.

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