



Evaluation of the Effect of Superoxidised Water (Oxum) V/s Povidone Iodine (Betadine) on Similar Types of Wounds

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Abstract

Background: Aim: To evaluate the effect of superoxidised water (Oxum) V/s povidone iodine (Betadine) on similar types of wounds. **Methods:** The present study was conducted after approval from ethical committee at gurunanak Dev hospital/GMC Amritsar to evaluate the effect of Superoxidised water (Oxum) V/s Conventional dressing (Povidone Iodine) on similar type of wounds. The present study was conducted in total of 100 patients with 50 patients in each group. in Group A patients where dressing and topical management was done using superoxidised solution (oxum) while in group B patients dressing and topical management was done using betadine solution). **Results:** Both groups were comparable on the basis of age and sex. Equal number of cases were included for each procedure included in the present study. Survey and examination of the patients was done on day 1,5,9,18,21 for each patient. Wound reduction, periwound swelling, pus discharge and reepithelization was studied along with the adverse effects and showed that all the parameters were significantly less in oxum group. **Conclusions:** The results of the present study appears to show more favourable results for oxum then betadine The results of this study justify further research into the use of oxum in the treatment of various wounds and ulcers.

Keywords:- Superoxidised Water, Povidone Iodine, Wounds.

INTRODUCTION

Wound and their management are fundamental in the practice of surgery in trauma, roadside accidents step stabs war injuries bites and bones wound is frequently the primary pathology in elective surgery it is through the wound that the assess is obtained to deal with underlying pathology in all above situations surgeons task is to minimize the adverse effect of injury remove or repair damaged structure and having the process of wound healing to restore function in human

beings and regeneration of tissues is limited only epithelium and liver can actually regrow. Wound healing is a mechanism whereby body attempts to restore integrity of the injured part homeostasis phase is followed by inflammation consisting of cellular cleaning of wound by macrophages. The proliferative phase involves fibroblast activity with production of collagen angiogenesis and reepithelization of wound surface. The remodeling phase is characterized by maturation of collagen with realignment of

fibers along the lines of lesion and wound contraction.^[1]

Surgical Site infection (SSI) has been a major complication of trauma and surgery surgical site infection in patients who have contaminated wounds have exceptionally decreased since the introduction of prophylactic antibiotics and antiseptic solutions. The factors that determine whether the wound will become infected include: host response, virulence of infective agent, vascularity and health of tissue being invaded, presence of dead or foreign material, use of antibiotic during decisive period.^[2]

Antibiotics are used as profile access and to treat established infection they use actually requires recognition and determination of sensitivities of causative Organism the appropriate treatment of localized SSI is interventional drainage of pus and debridement giving surgical incisions through infected and contaminated tissue.^[3]

When possible tissue or pus for culture should be taken before the antibiotic coverage is started the choice of antibiotic is empirical until sensitivities are available infected wound at best managed by the rate primary or secondary closure. Disinfection of the wounds with the use of locally used antiseptic solution is equally important.^[4] Although a multi modal therapy the basis of wound healing an ideal antiseptic is one that is rapidly little to all form of bacteria and their spores capable of bacterial activity for prolonged periods have no injurious effect on the wound healing tissues is easily applied and remove and has a wide spectrum of activity and absences acquired bacterial resistance.^[5] In the current study the effect of super oxide water versus providing sodium on bone healing go standard. Thus present study is conducted to evaluate the

effect of superoxidised water (Oxum) V/s povidone iodine (Betadine) on similar types of wounds.

MATERIAL AND METHODS

The present study was conducted after approval from ethical committee at Guru Nanak Dev hospital/GMC Amritsar to evaluate the effect of Superoxidised water (Oxum) V/s Conventional dressing (Povidone Iodine) on similar type of wounds. The present study was conducted in total of 100 patients with 50 patients in each group. in Group A patients where dressing and topical management was done using superoxidised solution (oxum) while in group B patients dressing and topical management was done using betadine solution).

The informed consent was taken in all the cases. The patients having wounds (Burns, acute and chronic ulcers, venous stasis ulcers, diabetic foot ulcers, , traumatic wounds, post surgical wounds, pressure/bed sores, cellulitis, carbuncles, abscesses of different types, fistula in ano, gangrenous wounds and internal irrigation like peritoneal lavage in peritonitis) were included in both the groups. similar types of cases were used in both the groups. Different methods like washing, sprinkling, gauze dressing, immersion and irrigation were used to apply the solution to the wounds. The required blood investigations were carried out in all the cases. antibiotics and cultures were indicated wherever it was required.

RESULTS

Both groups were comparable on the basis of age and sex. Equal number of cases were included for each procedure included in the

present study. Survey and examination of the patients was done on day 1,5,9,18,21 for each patient. Wound reduction, periwound swelling, pus discharge and reepithelization

was studied along with the adverse effects which are shown in table 1,2,3,4 and 5 respectively.

Table 1: Showing Average Reduction in Wound Size (% Age) in Both Groups.

	Oxum Group						Betadine Group					
	1	5	9	12	18	21	1	5	9	12	18	21
Acute abscess	-	50	75	100			-	50	70	80	90	100
Generalised peritonitis	Used During Operation For Irrigation						Used During Operation For Irrigation					
Traumatic ulcers	Wound Stitched						Wound Stitched					
Superficial wounds	Wound Stitched						Wound Stitched					
burns	-	20	30	60	80	100	-	10	20	50	75	90
Diabetic foot ulcers	-	10	20	30	50	70	-	10	15	20	40	50
abrasions	-	30	50	75	100	-	-	20	40	60	80	100
Bed sores	-	10	20	40	60	70	-	10	20	30	40	50
Chronic leg ulcers	-	10	25	50	70	80	--	10	20	40	60	70
Infected wounds	--	20	30	60	80	90	-	20	30	50	70	80
Fistula in ANO	-	20	40	60	80	90	-	20	30	50	70	80
Breast abscess	-	50	75	100			-	50	70	90	100	
Injection abscess	-	50	75	100			-	50	70	90	100	
Peri-anal abscess	-	30	50	75	90	100	-	30	50	70	80	90
Venous ulcer	-	10	25	40	60	80	-	10	20	30	45	60
carbuncle	-	20	40	60	75	100	-	10	20	40	60	80
Scrotal abscess	-	25	50	75	100		-	20	40	60	80	100
Fournier gangrene	-	20	25	50	70	90	-	10	20	40	60	80

Table 2: Showing Reduction (%Age) in Periwound Swelling/Erythema

	Oxum Group						Betadine Group					
	1	5	9	12	18	21	1	5	9	12	18	21
Acute abscess	-	75	100	-	-	-	-	40	75	100	-	-
Generalised peritonitis	Used During Operation For Irrigation						Used During Operation For Irrigation					
Traumatic ulcers	Wound Stitched						Wound Stitched					
Superficial wounds	Wound Stitched						Wound Stitched					
burns	-	30	50	75	100	-	-	20	40	60	80	100
Diabetic foot ulcers	-	10	20	30	50	75	-	10	15	20	40	50
abrasions	-	50	75	100	-	-	-	40	70	90	100	-
Bed sores	-	50	70	90	100	-	-	40	60	75	90	100
Chronic leg ulcers	-	40	70	90	100	-	--	40	75	85	100	-
Infected wounds	--	50	75	100	-	-	-	40	75	85	100	-
Fistula in ANO	-	50	75	100	-	-	-	20	30	50	70	80
Breast abscess	-	50	75	100			-	50	70	90	100	
Injection abscess	-	50	75	100			-	50	70	90	100	



Perianal abscess	-	75	100	-	-	-	-	40	75	100	-	-
Venous ulcer	-	40	70	90	100	-	--	30	60	80	90	100
carbuncle	-	50	75	100	-	-	-	40	70	85	100	-
Scrotal abscess	-	50	75	100	-	-	-	40	70	85	100	-
Fournier gangrene	-	30	60	80	90	100	-	25	50	70	80	90

Table 3: Showing Reduction in Amount of Pus Discharge

	Oxum Group						Betadine Group					
	1	5	9	12	18	21	1	5	9	12	18	21
Acute abscess	-	50	75	100	-	-	-	40	60	90	100	-
Generalised peritonitis	Used During Operation For Irrigation						Used During Operation For Irrigation					
Traumatic ulcers	Wound Stitched						Wound Stitched					
Superficial wounds	Wound Stitched						Wound Stitched					
burns	-	30	50	75	100	-	-	25	40	60	80	100
Diabetic foot ulcers	-	30	50	75	100	-	-	25	40	60	80	100
abrasions	-	NO PUS					-	NO PUSS				
Bed sores	-	30	50	75	100	-	-	25	40	60	80	100
Chronic leg ulcers	-	30	60	80	100	-	-	25	40	60	80	100
Infected wounds	--	50	75	100	-	-	-	40	70	85	100	-
Fistula in ANO	-	40	60	80	100	-	-	30	50	70	85	100
Breast abscess	-	50	75	100			-	40	70	85	100	
Injection abscess	-	50	75	100			-	40	70	85	100	-
Perianal abscess	-	50	75	100			-	40	70	85	100	-
Venous ulcer	-	30	60	80	100	-	--	25	40	60	80	100
carbuncle	-	50	75	100	-	-	-	50	75	100	-	-
Scrotal abscess	-	50	75	100	-	-	-	50	75	100	-	-
Fournier gangrene	-	30	60	80	90	100	-	25	50	70	80	90

Table 4: Showing Average Increase (%Age) Granulation And Epithelisation

	Oxum group						Betadine group					
	1	5	9	12	18	21	1	5	9	12	18	21
Acute abscess	-	50	75	100	-	-	-	40	70	90	100	-
Generalised peritonitis	Used During Operation For Irrigation						Used During Operation For Irrigation					
Traumatic ulcers	Wound Stitched						Wound Stitched					
Superficial wounds	Wound Stitched						Wound Stitched					
burns	40	60	80	90	100	-	-	30	45	60	75	90
Diabetic foot ulcers	-	30	50	75	100	-	-	30	45	60	75	90
abrasions	-	50	75	100	-	-	-	40	60	80	100	-
Bed sores	-	40	70	85	100	-	-	30	50	70	90	100



Chronic leg ulcers	-	40	70	85	100	-	-	30	50	70	90	100
Infected wounds	--	50	75	100	-	-	-	40	70	90	100	-
Fistula in ANO	-	40	60	80	100	-	-	30	50	70	85	100
Breast abscess	-	50	75	100			-	40	70	90	100	
Injection abscess	-	50	75	100			-	40	70	90	100	-
Perianal abscess	-	50	75	100			-	40	70	85	100	-
Venous ulcer	-	40	70	85	100	-	-	30	50	70	85	100
carbuncle	-	50	75	100	-	-	-	30	50	70	90	100
Scrotal abscess	-	50	75	100	-	-	-	40	70	90	100	-
Fournier gangrene	-	30	60	80	90	100	-	25	50	70	80	90

Other Parameters Oserved

	Oxum group	Betadine group
Pain And Discolouration	Absent	Present
Antibiotics Use	Less	More
Hospital Stay	14±7 days	20±7 days

DISCUSSION

In the current study the affect of superoxidised water (oxum) v/s povidone sodium on wound healing was studied. The results showed that in the current study diabetic foot ulcer and chronic leg ulcers patient treated with oxum shows early granulation and rapid epithelialization when compared to betadine group. The mean follow up of 21 days shows that every reduction in wound size and peri-wound edema / erythema in oxum group was 70% as compared to 50% in the betadine group. Burns patients treated with oxum showed early recovery with lesser esher formation and better granulation and rapid healing furthermore irrigation and pain while applying oxum was less when compared to betadine. In the appearance of granulation tissue was more healthy with evidence of better micro circulation in oxum group.

In current study ten patients suffering from generalised peritonitis were studies where laprotomy was done. While doing operation peritoneal lavage followed by irrigation was

done using oxum in five patient in Group A and similar treatment was done using betadine in other patients in Group B. Preoperative preparation and follow up dressing were also done using same solution. Patients treated with oxum showed better recovery an early appearance of bowel sounds and healthy wounds. when compared with the control group the average length of hospital stay of patient treated with oxum was less as compared to betadine group.

Similar results were shown by 6. Eftekharizadeh F et al who conducted a study on 110 patients of on 218 of chronic diabetic foot ulcers and compared the effect of oxum and povidone iodine. They showed that patients treated with oxum recovered early and had significantly less healing time then the patients treated with betadine.^[6]

Similar results were shown by kapur et al who evaluated oxum and betadine in different wounds and concluded that Oxum treated wounds showed reduction in inflammation and their healing earlier than betadine group.^[7]



Abhyankar et al,^[8] in 2009 in their study compared oxum and betadine as a topical treatment of chronic wounds conducted in 30 Indian patients, with 15 patients in each group. He concluded that use of oxum (super oxidised water) is a novel technological innovation in the therapy of chronic wounds. Oxum has been shown to be effective, well tolerated and superior to betadine in wound care. Similar results were shown by haldi et al and prabhakar et al who concluded that topical super-oxidized solution dressings accelerated the healing process resulting in faster recovery through reduction in ulcer area in patients infected with diabetic ulcers compared to topical povidone iodine dressing.^[9,10] Super-oxidized solutions are electrochemically processed aqueous solutions manufactured from pure water and sodium chloride (NaCl). During the electrolysis process, water

molecules are pulled apart, and reactive species of chlorine and oxygen are formed. The principle of "Wound Dressing with Super-Oxide Solution" was officially started in the year 2003 when it achieved a status of "Disinfectant and Antiseptic" in its homeland Mexico.^[11,12] There have been isolated reports of its use in healing of diabetic foot ulcers, abscess cavities, surgical wounds and various other types of ulcers.^[13] Further, this solution has been used in management of chest wall infections and reportedly reduced the time of healing in a significant manner.^[14]

CONCLUSIONS

The results of the present study appears to show more favourable results for oxum than betadine. The results of this study justify further research into the use of oxum in the treatment of various wounds and ulcers.

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