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Research Article

A COMPARATIVE STUDY OF SEPTILOC VERSUS POVIDONE IODINE DRESSING IN INFECTIVE SURGICAL LESION

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ABSTRACT
The infection of wounds remained a chief complaint before antiseptic era. Surgeon's weapons sharpened with advent of carbolic acid which was the first anti septic introduced in surgical practice in 1867. The use of iodine and its combination with alcohol commonly known as tincture iodine was used in the wound antisepsis despite its irritating effect. Presently available antiseptics are many in number.eg include chlorhexidine, chlorxylenol, cetrimide, povidone iodine etc. In present study a comparative survey between anti septic efficacies of povidone iodine and septiloc was undertaken. In a prospective study between povidone iodine and septiloc in surgically infected lesions it is found to have no significant difference between ability of both solutions in promoting healing of the lesions.

Keywords: *Antiseptic, Wound, Povidone Iodine, Septiloc, Wound Healing, Dressing*

INTRODUCTION
The infection of wounds remained a chief complaint before antiseptic era (Lyons, 1978). Surgeon's weapons sharpened with advent of carbolic acid which was the first anti septic introduced in surgical practice in 1867. The honey is widely used drug because of hygroscopic action (Aysen *et al.*, 2002; Natarajan *et al.*, 2001). The use of iodine and its combination with alcohol commonly known as tincture iodine was used in the wound antisepsis despite its irritative effect (Georgiade and Harris, 1973). Presently available antiseptics are many in number.eg include chlorhexidine, chlorxylenol, cetrimide, povidone iodine etc. In present study a comparative survey between anti septic efficacies of povidone iodine and septiloc was undertaken. Department of Surgery, Shree Krishna Hospital, Karamsad, where this study was carried out is a tertiary care centre with adequate facilities. In this hospital patients with multiple and complex wounds pathologies are treated regularly on outdoor and indoor basis. Wounds resulting from common domestic injuries, road traffic accidents, assaults, diabetic ulcers, operative and iatrogenic wounds are treated.

MATERIALS AND METHODS
This study is a randomized control trial comparing the efficacy between Povidone iodine and Septiloc solutions in treating surgically infected lesions. The study is approved by "human resources and ethical committee" The study is conducted in department of surgery at Shree Krishna hospital, Karamsad.

***Inclusion Criteria*:** All age groups except Burns wound. Patients with septicaemia. Malignancy. For the study total 100 patients are enrolled out of which divided into 'odd' and 'even' serial number groups in accordance to their enrolment into the study, given names as

- Group A (odd numbers) – dressed using Septiloc.
- Group B (even numbers) – dressed using Povidone iodine

After taking informed and written consent from the patients Clinical data recorded in relation to:

- Patient's informal data.
- Aetiology of lesion, duration from presentation and associated complaints pertaining to the lesion.
- History of Diabetes Mellitus, symptoms/signs of ischemia, recurrent trauma, varicosity of veins, neurological impairment, bedridden state, immunocompromised state, malnutrition and previous treatment.
- Condition of lesion with reference to its size, location, discharge, tissue type and healing quality, vascularity, sensations and joint mobility.

In each group, the antiseptic solution for dressing used as described above, group A with odd numbers use Septiloc and group B with even numbers use Povidone iodine.
In Septiloc dressing wound are cleaned with the same solution and then dressing is done using the same solutions while in Povidone iodine dressings wounds are first cleaned with Povidone iodine then with normal saline and then dressed again with Povidone iodine. Povidone iodine used was 5%w/v containing 0.5% w/v available iodine.
Since gram-positive organisms are the most common organisms implicated in surgical wounds, initially all patients shall be given empirically Co-Amoxicillin Clavulanic acid, which if needed shall be modified depending on the culture sensitivity, of the swab cultures taken from poorly-healing wounds.
The data tabulated according to
1) Time required for achieving the following criteria.
2) Number of dressings required to achieve the following criteria.

Table 1: Time and Numbers required to achieve said criteria

Sr. No	Achievement criteria	Septiloc		Povidone iodine	
		Time (in days)	Dressings (in numbers)	Time (in days)	Dressings (in numbers)
1	Appearance of serosanguineous fluid				
2	Absence of pus				
3	Absence of slough				
4	Disappearance of induration or redness				
5	Disappearance of surrounding oedema				
6	Appearance of healthy granulation tissue				
7	Reduction in size				

Other details are gathered as:

Table 2: Other Parameters for Septiloc and Povidone Iodine

Sr. No.	Other parameters	Septiloc	Povidone iodine
1	Duration of hospital stay (in days)		
2	Surgical intervention required (skin grafting, debridement, secondary suturing, flaps)		
3	Wound culture organism		
4	Antibiotic sensitivity		
5	Days of antibiotics		
6	Duration of complete healing		

ANALYSIS & DISCUSSION

From March 2009 to October 2010,100 patients having different kind of surgical lesions requiring dressing were studied. Randomly selected 50 cases were grouped under Septiloc dressing [group A], remaining 50 cases having similar kind of surgical lesions were grouped under Povidone iodine [group B] and they were compared. The majority of the patients in both group A and B are in the age group 51-75 years which can be explained by old age group being more susceptible to trauma and lesions. In the present study, Female: Male ratio in Group A is 1:2 and Group B is 1:3.9
This suggests the male preponderance in the study which can be explained by males having more propensities for trauma and more awareness amongst males as compared to females for the treatment of lesions.
In this study in both groups majority of patients were non diabetic as compared to diabetic patients though diabetic lesions are more common in community. In reality demographic data of this area suggests that diabetes is prevalent in this region. This discrepancy may be due to selection of patients at the time of presentation according to presenting surgical lesion and due to small study group.

Table 3: Size of wound at presentation

INITIAL SIZE[cm^2]	POVIDONE IODINE	SEPTILOC
01-25	39	37
26-50	05	07
51-100	04	04
>100	02	01
AVERAGE SIZE	23.18 cm^2	20.37 cm^2

P value obtained from this observation is 0.68, which suggests that statistically there is no significant difference between the average sizes of the lesion in two groups. So size of the wound does not affect the outcome obtained in group A and group B.

Table 4: Outcomes in diabetic patients

OUTCOME	SEPTILOC	POVIDONE IODINE
Surgical intervention	47.61%(n=10)	41.67%(n=5)
No surgical intervention	52.39%(n=11)	58.33%(n=7)
TOAL	100%(n=21)	100%(n=12)

Table 5: Outcome in non diabetic patients

OUTCOME	SEPTILOC	POVIDONE IODINE
Surgical intervention	24.14%(n=7)	13.16%(n=5)
No surgical intervention	75.86%(n=22)	86.84%(n=33)
TOTAL	100%(n=29)	100%(n=38)

In septiloc group total 21 diabetic patients were treated. Out of these patients treated 47.61% required surgical intervention and remaining 52.39% recovered without any surgical intervention. In the same group total n=29 non diabetic patients were treated amongst which 24.14% required surgical intervention and remaining 75.86% recovered without any surgical intervention. It can be stated from the above data that morbidity in terms of surgical intervention like amputation and debridement was more in diabetic patients as compare to non diabetic patients with septiloc usage. Even with povidone iodine usage morbidity was found to be higher in diabetics as compare to non diabetics.

Total 12 diabetic patients were treated with povidone iodine amongst which 41.67% required surgical intervention and 58.33% recovered without any surgical intervention. In non diabetic patients total 38 patients were treated amongst which 13.16% required surgical intervention and in 86.84% no surgical intervention required.

Table 6: Final results

Sr. No.	Achievement Criteria	Septiloc Time (Days)	Povidone Iodine Time (Days)	t-statistic	p
1	Appearance of serosanguineous fluid	11.76	8.00	-1.91	0.0601
2	Absence of slough	14.08	11.38	-1.19	0.2383
3	Disappearance of indurations or redness	11.92	9.00	-1.23	0.2260
4	Disappearance of surrounding oedema	8.45	10.77	0.93	0.3560
5	Appearance of healthy granulation tissue	15.84	13.31	-0.93	0.3566
6	Days for complete healing	12.96	11.66	-0.79	0.4302

On this data Bonferroni correction was applied for calculation of p value.P value for this table is: 0.05/6=**0.0083.**According to this p value, none of the p value obtained is statistically significant.

So we can state that though apparently the values in all achievement criteria appear low for Povidone iodine as compared to Septiloc, statistically there is no significant difference between both of them. So Septiloc is equally efficacious in treating the lesions as Povidone iodine.

Though in my study there was no side effect of Povidone iodine use, the documented side-effect of Povidone iodine is skin irritation and allergic reactions. So, in susceptible population, use of Septiloc is advocated rather than Povidone iodine as it is a herbal product. It is assumed to be free of side effect and till now there is no documented side effect of Septiloc.

Table 7: Other outcomes

Sr. No.	Other Parameters	Septiloc In days	Povidone Iodine in days	t-statistic	P value
1	duration of hospital stay (in days)	14.24	12.28	-1.04	0.3
2	surgical intervention required (skin grafting, debridement, secondary suturing, flaps)	6 *cases*	5 *cases*	NA	NA
3	Duration for tenderness relief	10.45	8.72	-0.86	0.3924
4	Appearance of normal wound edges	12.12	8.9	-2.13	0.0358
5	Normalization of local temperature	10.86	9.09	-0.71	0.4806

On this data Bonferroni correction was applied for calculation p value. P value for this table is: 0.05/5=**0.01**. According to this p value none of the obtained p value is statistically significant.
Similarly as stated above none of the p value is significant so there is statistically no difference between Septiloc and Povidone Iodine in achieving above mentioned criteria.
So, Septiloc is equally efficacious as Povidone iodine is in achieving above mentioned Criteria.

Final outcome in non diabetic patients (n=67):
Table 8: Achievement criterias in non diabetic patients

		Septiloc (days)	Povidone iodine (days)
1	Appearance of serosanguineous fluid	8.8	6.4
2	Absence of slough	12.54	10.26
3	Disappearance of indurations or redness	10	7.89
4	Disappearance of Surrounding Oedema	7.27	7.38
5	Appearance of Healthy Granulation Tissue	13.36	12.3
6	Days for complete healing	10.41	9.86

From the above table it can be stated that average days require for appearance of serosanguineous fluid were 8.8 for septiloc & 6.4 for povidone iodine. For all criteria's the number of days require are lesser for povidone iodine as compare to septiloc so apparently povidone iodine is better than septiloc in treating surgically infected lesions.

Table 9: Other parameters in non diabetic patients

Sr. No.	Other parameters	Septiloc In days	Povidone iodine In days
1	Duration of hospital stay (in days)	11.24	10.13
2	Surgical intervention required (skin grafting, debridement, secondary suturing, flaps)	*7 cases*	5 cases
3	Duration for tenderness relief	8.1	5.9
4	Appearance of normal wound edges	9.68	7.31
5	Normalization of local temperature	8.5	7.94

From above table it can be stated that average duration require for achievement of the above mentioned criteria is more for septiloc than povidone iodine so apparently povidone iodine is more efficacious than septiloc but this data cannot be statistically signified because of smaller sample size.

Final outcome in diabetic patients (n=33):

Table 10: Achievement criterias in diabetic patients

Sr. No.	Other parameters	Septiloc In days	Povidone iodine In days
1	Duration of hospital stay (in days)	18.38	19.08
2	Surgical intervention required (skin grafting, debridement, secondary suturing, flaps)	*10 cases*	*5 cases*
3	Duration for tenderness relief	13.2	16.12
4	Appearance of normal wound edges	15.47	13.91
5	Normalization of local temperature	12.83	14.24

From above table it can be stated that in diabetic patient's remission is faster with septiloc than povidone iodine but overall diabetic patient requires longer time for recovery than non diabetic patients in both groups. But due to small study groups this data cannot be statistically proven.

Table 11: Other parameters in diabetic patients

Sr. No.	Other parameters	Septiloc In days	Povidone iodine In days
1	Duration of hospital stay (in days)	18.38	19.08
2	Surgical intervention required (skin grafting, debridement, secondary suturing, flaps)	*10cases*	5 cases
3	Duration for tenderness relief	13.2	16.12
4	Appearance of normal wound edges	15.47	13.91
5	Normalization of local temperature	12.83	14.25

Above table stats that average duration of hospital stay is lower with septiloc dressings in diabetic persons as compare to povidone iodine dressings. So septiloc is a better dressing solution in diabetic persons than povidone iodine but data con not be statistically signified due to smaller sample size.

Conclusion

In a prospective study between Povidone iodine and Septiloc in surgically infected lesions it is found to have no significant difference between ability of both solutions in promoting healing of the lesions Majority of the patients in the study were non diabetic as compared to diabetic patients (Rodeheaver, 1997; Payne *et al.*, 1999). This discrepancy may be due to selection of patients at the time of presentation according to presenting surgical lesions Time required for healing in diabetic person is more than that of non diabetic persons with both solutions which proves that diabetes impairs wound healing. Although time required for healing in diabetic patient is low for patients in whom septiloc is used this data cannot be statistically signified due to small sample size. Total 100 patients were studied in a prospective study between Povidone iodine and Septiloc in surgically infected lesions. In both groups average age of persons was between 51-75 years amongst which there was male preponderance found. Average size of lesion on the day of presentation for Povidone iodine was 23.18 cm^2 & for Septiloc was 20.37cm^2, which have statistically been proved non significant. Amongst 50 patients in whom Septiloc was used 4 required amputation, 6 required debridement. In 6 patients secondary intervention in terms of STSG was required and in 31 patients lesions healed without any surgical intervention. Amongst 50 patients in whom Povidone iodine was used 2 required amputation, 5 required debridement. In 5 patients secondary intervention in terms of STSG was required and in 38 patients lesions healed without any surgical intervention. With Septiloc use, the average period required for appearance of serosanguineous fluid is11.76 days. ,average time taken for absence of slough was 14.08 days, average time for disappearance of slough was 11.92 days, average time for disappearance of oedema was 8.45 days, average time for appearance of healthy granulation tissue was 15.84 days & average time taken for complete healing was 12.96 days. With Povidone iodine use, the average period required for appearance of serosanguineous

fluid is 8 days., average time taken for absence of slough was 11.38 days, average time for disappearance of slough was 9 days, average time for disappearance of oedema was 10.77 days, average time for appearance of healthy granulation tissue is 13.31 days & average time taken for complete healing was 11.66 days. Average duration of hospital stay with Septiloc solution was 14.24 days and with Povidone iodine was 12.28 days. Amongst all the patients 6 patients with Septiloc dressing required surgical intervention and 5 patients with Povidone iodine required surgical intervention.

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