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A Comparative Study on the Effect of Honey and Povidone Iodine Ointment on Pain, Wound Healing and Quality of Life of Patients with Varicose Ulcer

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Abstract

The present study was aimed to assess the effect of honey and Povidone-Iodine ointment on pain, wound healing and quality of life of patients with varicose ulcer. An evaluative approach, non-experimental comparative study was conducted from September – 2013 to March – 2014 among the 100 patients with varicose ulcer admitted in the Shanthi Hospital, located in Tisayanvilai, Tirunelveli District of Tamil nadu, South India. Purposive sampling was done to choose the study population. The total study population was divided in to two groups of 50 members each. Group – 1 received honey treatment. Group – 2 received Povidone – Iodine ointment 10% w/w (Betadine ointment) treatment. A pre-designed and pre-tested questionnaire was used as a study tool. Initially the demographic data was collected. The details of pain, quality of life and wound were collected before and after treatment. The collected data was analyzed by using statistical package for the social sciences (SPSS) software. The results showed that majority of patients (66%) were male and aged between 45 – 54 years (43%). All the patients were literate. Majority of patients (54%) were married. 35 of 100 patients had smoking habits and 47 of 100 patients had alcohol usage habits. 59 patients having the ulcer for more than five years and 41 patients having the ulcer duration below 5 years. Pain was reduced and the quality of life was improved significantly by both honey and Povidone – Iodine ointment. In the 15th day follow up the net wound healing score of honey was 16.6 ± 3.3 . The net wound healing score of Povidone – Iodine ointment in the 15th day follow up was 18.2 ± 3.2 . From this study it was clear that the Povidone – Iodine ointment showed a significant wound healing effect and both the honey and Povidone – Iodine ointment showed a significant effect on pain and quality of life. In the future a similar study with larger sample size and longer duration may give more valuable results.

Key words: Honey, Povidone – Iodine ointment, Varicose ulcer.

INTRODUCTION

Ever since his creation, man has been getting wounded and has been devising methods and medications for managing these wounds, Honey is one such natural product which is mentioned in various ancient books as panacea for wide range of ailments, the wound management being one such indication [1]. For thousands of years, honey has served as a natural remedy for numerous ailments [2]. It was used in Ayurvedic medicine since 2500 BC and other old culture as well [3]. However researchers started to document the wound healing properties of honey in the early 20th century, but the introduction of antibiotics in 1940 temporarily halted its use. Now concerns about antibiotic resistance and a renewed interest in natural remedies have prompted resurgence in the antimicrobial and wound healing properties of honey [4-5]. In recent years honey has enjoyed a renaissance with considerable amounts of research being performed [6-7]. Honey provides a moist healing environment yet prevents bacterial growth even when wounds are heavily infected. It is a very effective means of quickly rendering heavily infected wounds sterile, without the side effects of antibiotics, and it is effective against antibiotic-resistant strains of bacteria. Its antibacterial properties and its viscosity also provide a barrier to cross- infection of wounds. It also provides a supply of glucose for leucocytes, essential for the 'respiratory burst' that produces hydrogen peroxide, the dominant component of the antibacterial activity of macrophages [8]. Honey dressings have also been shown to reduce odours

from infected wounds [2]. Honey has been used successfully on leg ulceration [9], abdominal wound disruption [10], burns [11] and chronic inflammation [12]. To supplement healing, various ointments are used in clinical practice [13]. Povidone – iodine preparations are widely used and highly effective antiseptics [14].

Although many previous studies with the aim of studying the effectiveness of honey in the treatment and control of both acute and chronic wounds in both human and animals have been undertaken, we take a decision that compare the effectiveness of honey and Povidone – iodine ointment on pain, wound healing and quality of life of patients with varicose ulcers.

METHODS

An evaluative approach, non-experimental comparative study was conducted from September – 2013 to March – 2014 in the Shanthi Hospital, located in Tisayanvilai, Tirunelveli District, Tamil Nadu, South India. It is a 150 bedded hospital having the departments such as Medicine, Maternity, Surgery and Paediatrics and facilities like Operation theatre, ICU and CCU.

One hundred patients with varicose ulcer, admitted in the Shanthi Hospital were enrolled for the study. Purposive sampling was done to choose the study population. The inclusion criteria consist of: Patients of both sexes in the age group of 30 – 70 years with varicose ulcer, wound size less than 15cm² and willing to participate in the study, they must available for 2 weeks in the hospital. The

exclusion criteria were: Patients with malignant disease, HIV infection, pressure ulcers, undergone amputation and wound debridement. All the selected patients agreed to participate in the study. A pre-designed and pre-tested questionnaire was used as a study tool. The reliability of the tool was established by inter rater method.

The demographic data such as age, sex, education, marital status, occupation, smoking and alcohol usage were collected from the participants. The total study population was divided in to two groups of 50 members each. Group – 1 received honey treatment. Commercially purchased honey, produced from the mountainous area of Kanyakumari District, Tamil nadu, South India was used. Group – 2 received Povidone – Iodine ointment 10% w/w (Betadine ointment) treatment.

After cleaning the wound with normal saline, for Group – 1 patients, a layer of honey and for Group – 2 patients, Povidone – Iodine ointment was applied and covered with sterile gauze on daily basis. Wound healing and quality of life scores for both the groups were assessed on 5th, 10th and 15th day. The wound assessment scale includes the information such as size and depth of the wound, nature of wound edges, undermining or tunneling, necrotic tissue and its amount, exudate type and its amount, odour, skin colour, tissue edema and induration of treatment zone. Intensity of pain also assessed. The quality of life assessment scale includes various information such as difficulties in attending the social functions, walking difficulties, strain on personal relationship, problems in washing and dressing, worry about ulcer healing,

difficulty in cooking, cleaning, travelling and gardening due to ulcers, usage of chapels or shoes, difficulties related with sleeping and mobility. Approximately 20 minutes was taken for assessment on each participant. The data obtained was analyzed by using statistical package for the social sciences (SPSS) software.

RESULTS

The present study was conducted in one hundred in-patients with varicose ulcer, admitted in Shanthi Hospital, located in Tisayanvilai, Tirunelveli District, Tamil Nadu. Regarding with demographic data about the sample subjects, the results showed that 66 of 100 sample subjects were male. Rests, 34 members were female. According to age, 43 participants were aged between 45 to 54 years. 36 participants were aged between 55 to 64 years. 16 participants were aged between 35 to 44 years and 5 participants were aged between 65 to 70 years. Analysis of educational status revealed that all participants were literate. 14 participants had education up to primary school level. 59 participants were studied up to high school level and 19 participants were graduates and remaining 8 candidates were professional qualified. Among the study population, 54 candidates were married, 32 candidates were unmarried, 11 candidates were widow and 3 candidates were divorcee. Regarding with occupation, 35 participants were unskilled, 31 participants were semi skilled, 14 participants were skilled and 12 participants were unemployed and remaining 8 participants were professionals. The results showed that 35 of 100 sample subjects

having smoking habits and remaining 65 candidates did not having this habit. Regarding with alcohol usage, 47 candidates said 'yes' and 53 candidates said 'no'. Analysis of ulcer duration revealed that, majority of study population, 59 participants having the ulcer for more than five years and 41 participants having the ulcer duration below 5 years. The total study population was divided in to two groups of 50 members each. Group – 1 received honey treatment. Group – 2 received Povidone – Iodine ointment 10% w/w (Betadine ointment) treatment. In Group – 1, majority of patients, 34 of 50 (68%) were male. Rests, 16 patients (32%) were female. Among them, 15 candidates (30%) had smoking and 26 candidates (52%) had alcohol usage habit. In case of Group – 2, majority of patients, 32 of 50 (64%) were male. Rests, 18 patients (36%) were female. But here 20 candidates (40%) had smoking and 21 candidates (42%) had alcohol usage habit. From these results, it was found that the difference between the genders, smokers and alcohol users in both groups was statistically insignificant ($P > 0.05$). The results showed that there was no statistically significant association between the age, sex, education, marital status, occupation, smoking, alcohol usage and ulcer duration with the quality of life of patients.

The table – 1 showed the details of pain experienced by Group – 1 patients received honey treatment. In the baseline all the 50 candidates (100%) had severe pain. After starting treatment with honey, in the 5th day follow up, 38 candidates (76%) reported that they had moderate pain and

12 candidates (24%) reported that they had severe pain. The results after 10 days of treatment showed that 35 candidates (70%) had mild pain, 15 candidates (30%) had moderate pain. In the 15th day follow up 2 candidates (4%) reported that they had no pain. 45 candidates (90%) had mild pain and remaining 3 candidates (6%) had moderate pain. The results showed that none of the patients had severe pain in 10th and 15th day follow up. Results of Group – 2 patients received Povidone – Iodine ointment treatment showed that, before starting the treatment, all the 50 candidates (100%) had severe pain. After treatment, in the 5th day follow up, 22 candidates (44%) had moderate pain and 28 candidates (56%) had severe pain. In the 10th day follow up, 9 candidates (18%) had mild pain, 39 candidates (78%) had moderate pain and 2 candidates (4%) had severe pain. In the 15th day follow up, 30 candidates (60%) had mild pain and remaining 20 candidates (40%) had moderate pain. The results showed that there was no patients in the severe pain category only in the 15th day follow up (Table 2).

Regarding with quality of life score in Group – 1 patient, the results showed that initially the quality of life was poor for all the 50 study subjects (100%). After treatment with honey, the quality of life was fair for 43 candidates (86%) and it was good for the remaining 7 candidates (Table 3). In case of Group – 2, before treatment, the quality of life of 44 patients (88%) was poor. Rests, 6 patients (12%) said their quality of life was fair. After treatment with Povidone – Iodine ointment,

the quality of life was poor for two patients (4%) and it was fair for 35 patients (70%) and good for 13 patients (Table 4).

Analysis of the effect of honey on wound healing showed that, before starting the treatment the mean wound score was 41.9 ± 7.0 and during treatment, in the 5th day follow up it was 33.7 ± 6.1 , in the 10th day follow up the mean wound score was 29.1 ± 5.6 and finally in the 15th day follow up it was 25.3 ± 5.2 . The results were statistically significant (Table 5). In Group – 2, the results showed that the mean wound score before starting the Povidone – Iodine ointment treatment was 42.3 ± 3.3 . After starting the treatment, in the 5th day follow up it was 34.6 ± 3.2 . 10th day follow up showed 28.0 ± 3.6 and 15th day follow up showed 24.1 ± 3.7 mean wound scores (Table 6). These results were statistically significant.

Comparison of mean wound scores of Group – 1 and 2 patients revealed that, in Group – 1 the initial mean wound score was 41.9 ± 7.0 . In the 5th day follow up, the results showed that the net wound healing score was 8.2 ± 3.1 ; it was increased to 12.8 ± 2.9 in the 10th day follow up and finally reached 16.6 ± 3.3 in the 15th day follow up. In case of Group – 2, the initial score was 42.3 ± 3.3 . In the 5th day follow up, the net wound healing score was 7.7 ± 2.9 ; it was increased to 14.3 ± 3.3 in the 10th day follow up and finally reached 18.2 ± 3.2 in the 15th day follow up. From these results, it was found that the net wound healing score of Povidone – Iodine ointment was significantly greater than honey.

DISCUSSION

Clinicians have used numerous strategies to combat wound infections, including topical and systemic administration of antibiotics and various antiseptic agents to kill bacteria or inhibit their growth. A commonly used antimicrobial agent is Povidone-Iodine, a complex of iodine, the bactericidal component with polyvinylpyrrolidone (povidone), a synthetic polymer. Decisions regarding choice of wound treatment involve two basic considerations: (1) how safe is the treatment and (2) how effective is the treatment [15]. Recently the emergence of multi-drug resistant organisms has created a lot of chaos in the medical field. The organisms responsible for nosocomial infections have also shown an increased trend to be multi-drug resistant. Hence there is a need to find an alternative to counter these multi-drug resistant organisms [16]. Previous literature reports indicated that the honey has been used in clinical practice for many types of disease for centuries. It is still being used as a dressing material for burn wounds, decubitus ulcers, gunshot wounds and wound dehiscence. It enhances auto debridement by absorbing edematous fluid around the ulcer margins and promotes granulation tissue formation and epithelization [17]. Therefore the present study was aimed to assess the effect of honey and Povidone-Iodine ointment on the varicose ulcer. The study was conducted among the 100 in-patients of Shanthi Hospital, located in Tisayanvilai, Tirunelveli District of Tamil Nadu, South India. The total study population was

divided in to two groups of 50 members each. Group – 1 received honey treatment. Group – 2 received Povidone-Iodine ointment 10% w/w (Betadine ointment) treatment.

Regarding with pain in Group – 1 patient, before treatment, all the study subjects (100%) had severe pain. After treatment, in the 15th day follow up, none of the patient had severe pain. 90 and 6% of them had mild and moderate pain respectively and 4% had no pain. In case of Group – 2 also, before treatment, all the study subjects (100%) had severe pain. After treatment, in the 15th day follow up, none of the patient had severe pain. 60% had mild and 40% had moderate pain level. Regarding with the quality of life of Group – 1 patient, before treatment, all the study subjects had a poor quality of life. After treatment 86% of patients had a fair and 14% of patients had a good quality of life. In case of Group – 2, before treatment, 88 and 12% of patients had a poor and fair quality of life respectively. After treatment 70% of patients had a fair and 26% of patients had a good and 4% patients had a poor quality of life. There was no statistically significant association between the age, sex, education, marital status, occupation, smoking, alcohol usage and ulcer duration with the quality of life of patients. Before treatment, the mean wound score of Group -1 patient was 41.9 ± 7.0 and the same was 33.7 ± 6.1 in the 5th day follow up. Further in 10th and 15th day follow up it was 29.1 ± 5.6 and 25.3 ± 5.2 respectively. The net wound healing score of

honey was 8.2 ± 3.1 in the 5th day follow up, it was increased to 12.8 ± 2.9 in the 10th day follow up and finally reached 16.6 ± 3.3 in the 15th day follow up. In case of Group – 2, before treatment, the mean wound score was 42.3 ± 3.3 and the same was 34.6 ± 3.2 in the 5th day follow up. Further in 10th and 15th day follow up it was 28.0 ± 3.6 and 24.1 ± 3.7 respectively. The net wound healing score of Povidone – Iodine ointment was 7.7 ± 2.9 in the 5th day follow up, it was increased to 14.3 ± 3.3 in the 10th day follow up and finally reached 18.2 ± 3.2 in the 15th day follow up. Thus the Povidone – Iodine ointment had a significant wound healing effect comparing with honey.

CONCLUSION

The present study revealed the effectiveness of honey and Povidone – Iodine ointment in chronic varicose ulcers. From this study it was clear that the Povidone – Iodine ointment showed a significant wound healing effect comparing with honey. However the honey showed a significant effect on pain and quality of life. Of course the level of wound healing will differ from one individual to other. Moreover honey is a natural source but the ointment used was prepared artificially. A similar study with larger sample size and longer duration in the future may give more valuable results.

Table 1: Assessment of pain in Group -1 patients received honey treatment

Pain	Before treatment		During treatment					
			5 th day follow up		10 th day follow up		15 th day follow up	
	No	%	No	%	No	%	No	%
Nil	—	—	—	—	—	—	2	4
Mild	—	—	—	—	35	70	45	90
Moderate	—	—	38	76	15	30	3	6
Severe	50	100	12	24	—	—	—	—
Total	50	100	50	100	50	100	50	100

No – Number of patients

Table 2: Assessment of pain in Group -2 patients received Povidone – Iodine ointment treatment

Pain	Before treatment		During treatment					
			5 th day follow up		10 th day follow up		15 th day follow up	
	No	%	No	%	No	%	No	%
Nil	—	—	—	—	—	—	—	—
Mild	—	—	—	—	9	18	30	60
Moderate	—	—	22	44	39	78	20	40
Severe	50	100	28	56	2	4	—	—
Total	50	100	50	100	50	100	50	100

No – Number of patients

Table 3: Assessment of quality of life in Group -1 patients received honey treatment

Quality of life	Before treatment		After treatment	
	No	%	No	%
Poor	50	100	Nil	0
Fair	Nil	0	43	86
Good	Nil	0	7	14
Total	50	100	50	100

No – Number of patients

Table 4: Assessment of quality of life in Group -2 patients received Povidone – Iodine ointment treatment

Quality of life	Before treatment		After treatment	
	No	%	No	%
Poor	44	88	2	4
Fair	6	12	35	70
Good	Nil	0	13	26
Total	50	100.0	50	100.0

No – Number of patients

Table 5: Effect of honey on mean wound scores in Group –1 patients

Before treatment	I	N W S	t	df	significance
41.9 ± 7.0	33.7 ± 6.1	8.2 ± 3.1	18.664	49	P<0.001
Before treatment	II	N W S	t	df	significance
41.9 ± 7.0	29.1 ± 5.6	12.8 ± 2.9	31.214	49	P<0.001
Before treatment	III	N W S	t	df	significance
41.9 ± 7.0	25.3 ± 5.2	16.6 ± 3.3	35.328	49	P<0.001
I	II	N W S	t	df	significance
33.7 ± 6.1	29.1 ± 5.6	4.6 ± 2.2	21.201	49	P<0.001
I	III	N W S	t	df	significance
33.7 ± 6.1	25.3 ± 5.2	8.4 ± 2.5	34.640	49	P<0.001
II	III	N W S	t	df	significance
29.1 ± 5.6	25.3 ± 5.2	4.5 ± 1.8	21.789	49	P<0.001

I – 5th day follow up during treatment; II – 10th day follow up during treatment.

III – 15th day follow up during treatment; NWS – net wound healing score

Table 6: Effect of Povidone – Iodine ointment on mean wound scores in Group –2 patients

Before treatment	I	N W S	t	df	significance
42.3 ± 3.3	34.6 ± 3.2	7.7 ± 2.9	18.717	49	P<0.001
Before treatment	II	N W S	t	df	significance
42.3 ± 3.3	28.0 ± 3.6	14.3 ± 3.3	30.750	49	P<0.001
Before treatment	III	N W S	t	df	significance
42.3 ± 3.3	24.1 ± 3.7	18.2 ± 3.2	40.706	49	P<0.001
I	II	N W S	t	df	significance
34.6 ± 3.2	28.0 ± 3.6	6.6 ± 2.8	16.814	49	P<0.001
I	III	N W S	t	df	significance
34.6 ± 3.2	24.1 ± 3.7	8.4 ± 2.5	23.755	49	P<0.001
II	III	N W S	t	df	significance
28.0 ± 3.6	24.1 ± 3.7	4.5 ± 1.8	16.770	49	P<0.001

I – 5th day follow up during treatment; II – 10th day follow up during treatment.

III – 15th day follow up during treatment; NWS – net wound healing score

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