Original Article

The effect of fish oil on improvement of first stage bed sore

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Abstract

Background: Bed sore is one of the main problems for people confined to bed for long time and cannot move. According to the fact that prevention is easier and cheaper than therapy, in this study the effect of fish oil ointment on the improvement of first stage bed sore was assessed.

Materials and Methods: This study was carried out on two groups with 30 patients that had bed sore on shoulders, sacrum or heel. In the intervention group patients' position was changed every 2-3 hours and the bed sore was washed with water and cotton-wool and fish oil with thickness of 2-3 mm was applied on the place of sore. This method was used for seven days. If they improved, the method was stopped in the first days of procedure. At the end of seven days, again the first day checklist was completed, and it was compared to the questionnaire of the two groups, and analyzed separately according to the daily changes of intervention and control group.

Findings: There was statistically significant difference between the average of changes in the size of sore of the study group and control group ($p < 0.002$). The time average of improvement in the intervention group was less than control group.

Conclusions: Local use of fish oil could increase the improvement of first stage bed sore and increase in vessels, blood and oxygen supply of the place of sore.

Key words: Bed sore, fish oil, omega-3, sore improvement

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Introduction

Skin is an obstacle between internal organs and environment and intervenes in many body activities, such that an individual could not live without it.[1] Pressure ulcer is also a disorder that is created by frequent changes of skin in every individual with reducing intelligence, brain paralysis, chronic disease, spinal cord disorders, extensive fractures and in elderly patients and people who are motionless due to being bedridden for a long time.[2] Pressure ulcer is potentially deadly, that even in the most developed communities with the most developed technologies and medical equipment and with nursing services, has high rate of death and costs.[3] For example, outbreak of pressure ulcer is estimated to be 10% in German hospitals and by considering 1.3% of daily treatment cost, it will end up to 3.2€ per year.[4] The prevalence of pressure ulcers in Intensive Care Unit is higher than other units. 8% to 40% of ICU patients develop bedsores[5] and treatment costs are very high so pressure ulcer formation related to positioning while in the operating room is a leading cause of increased length of hospital stay among surgical patients, costing between $14,000 and $40,000 per patient.[6] The rate of spreading pressure ulcer in countries with low facilities, such as Iran, increases considerably, for example indices of bed sores in general ward is 70%, in ICU is 40%, in

orthopedic ward is 25%, for patients with spinal cord disorder is 85% and 33% for elderly in elderly housekeeping.[7,8] Pressure ulcer become a global problem and the American pressure ulcer international consultation society called this disorder as a national tragedy, since in addition in reducing health and creating intense pains, it leads to high hospital costs and wasting nurses and other hospital staff time.[4] Although pressure ulcer is among the few diseases that has been considered to be cured, but unfortunately it is definite that with regards to the high rate, the cure has not yet been suitable with proper efficiency for it. Fish oil consists of different types of vitamins and omega-3, with the characteristics of anti-inflammation and healing and its positive effects and benefits have been proved by numerous articles.[9,10,11] It is a cheap, simple and natural ointment, competing with costly treatments such as biological wounds dressings, or the high costs due to the increase in the bed wound and effects such as septicemia and death. Therefor this researcher was encouraged to consider the effects of fish oil ointment on recovering the bed wounds.

Materials And Methods

This research has been conducted by both Universities of Medical Sciences of Isfahan and Ahvaz. With the permission from health centers, patients from Isfahan and Ahvaz were studied. After being assured of having no effects on the procedure and evaluating the efficiency of the tools , referred to AL-Zahra educating center- Esfahan and by using the classification form for pressure ulcers of international consultation for pressure wound, recognized sixty patients affected by Pressure wounds (class I) in the sacrum area shoulders and heels , gradually. By using the questionnaire and information form, items such as age, sex, body index, wound location, intelligence rate, stimulation, nutrition and wound classification were considered and the data was registered. Then the cases like the wound diameter, redness and the rate of recovery were considered according to standard checking lists and the wound redness was analyzed by one of the projects co-workers and the wound specifications were considered with respect to the diameter of damaged area and the area redness and the diameter was measured with regards to the pressure ulcer scale for healing and the area diameter was measure with a ruler, in centimeters (largest length and largest width) and the rate of redness was considered accordingly: (class 1) considerable reduction of redness (class 2) brief reduction of redness, (class 3) no change in redness[12] but in analyzing the class 2 and 3 redness were mixed and the redness grade was considered as two groups of red and lack of redness areas. The ulcer characteristics were recorded and evaluated after each intervention. Selection of patients were based on goals, such that the patients entered the study according to criteria and were divided into two groups after evaluation of their age, sex, tallness, weight, ulcer location, intelligence, stimulation rate and redness of the ulcer, randomly, of treatment and placebo groups. Routine and standard care was used for the placebo group. i.e. the patients changed positions every 2-3 hours and the ulcer location was cleaned by cotton and ordinary water and fish oil ointment was rubbed on the location, such that the ulcer with approximate thickness of 2-3 mm was covered with the ointment and this was done for 7 days, but in case of full recovery, the procedure stopped earlier and the cases were evaluated and registered. After study and completing the checking lists and collecting the data, SPSS software (version 11) was used for analyzing the data and the obtained information was analyzed by using student t-test, chi-squire, variance analyses, t-test and Fischer questionnaires.

Findings

The result of the present research showed that the average size of the ulcer was 22.7 (20) and 21.8 (26.4) for the treating and placebo groups respectively, at the beginning of the study and there was no significant difference between the two groups, according to the student t-test ($p = 0.3$)

According to the obtained results at the beginning of intervention, all the ulcers of the patients under study were showing clear redness.

After 24 hours of treatment, 23 cases (76.7%) of the treating group showed brief reduction of redness, but there was no evidence of reduction of redness in placebo group. According to precise Fischer tests, the difference between the two group was totally significant ($p < 0.001$) 48 hours after treatment intervention, 23 people (76.7%) of the treating group who had received fish oil had reduction in redness, although none of the patients in placebo group showed such recovery. Chi-square test also showed 2 days after treatment that the redness changes were significant in the two groups. ($p < 0.001$)

72 hours after intervention, 22 patients (73.3%) who received fish oil had full recovery, but only 2 patients (6.7%) of the placebo group showed such recovery. Chi-square test showed that the redness changed after 72 hours of treatment was significant in the two groups. ($p < 0.001$)

At 96 hours after stating treatment, 29 patients from the treating group recovered, but only 3 were recovered with in the placebo group (96.7% against 10%).

Chi-square test showed that the frequency distribution of the redness changes, 96 hours after intervention, has significant difference for both groups ($p < 0.001$).

At the end of the 5th day (120 hours after intervention), 29 people from the treating group and 15 people from the placebo group had recovered (46.7% vs. 50%). Chi-square showed here too that the frequency distribution of the redness changes of the ulcer is different in the two groups, 5 days after 5 days ($p < 0.001$).

By 144 hours (6th days), all the patients recovered in treating group and 23 patients recovered in placebo group (76.7%). Chi-square test indicated that the frequency distribution of the redness changes has significant difference in this stage, too ($p < 0.001$).

Finally in the 168th hours (end of 7th day) all the patients in treating group and 25 patients in placebo group recovered and the ulcer changed the class 2 ulcer in 5 patients.

Considering the recovery of the wound in the two group of the results obtained in this study for the treating group, showed that the ulcer of all the 30 patients using fish oil, recovered in the placebo group, 25 patients recovered and the ulcer for 5 patients did not recover and transformed to class II ulcer. Doing the precise Fischer test on the data showed that the recovery of the bed wound in the two groups under study had a significant difference ($p < 0.002$) (Table 1).

According to the obtained results, the average period of bed wound recovery in treating patients with fish oil (12.6) 71.2 hours 30 patients and (27.3) 131.2 hours 25 patients in placebo group and according to t-standard test, the recovery time in the two groups was significant ($p < 0.001$) in other words, according to this test, fish oil could shorten the recovery time of bed wound (Table 2).

Discussion

The finding of this research indicates that topical treatment by fish oil could speed up the recovery of bed wound (class I) and the results of this study coordinate with other studies by other researches, regarding different types of bed wounds, although the systematic consumption of fish oil, in most researches have been considered and in a few investigations the topical usage of it is pointed to, which we are going to indicate them. Use of fish liver oil is effective on speeding up the wound reparation and also creation of vessels within the ulcer, and hence reduces the time of recovery the wound. Kassaee and Rashidy-Pour have expressed about the effect of topical use of fish oil on wound resulted from burning,[9] and using topical fish oil caused the reduction of the recovery time in our research. Daly et al. reported that nutrition with omega-3 fatty acids after election surgeries causes significant reduction in the time of betiding of the patients in hospitals.[13] Bjerve has reported that there is no efficient recovery for patients who lack omega-3 fatty acids.[14]

Table 1. Frequency of recovery and lack of recovery of the ulcers in studied groups

Group	Treating		Placebo group		Total	
	No	Percent	No	Percent	No	Percent
Recovery of the wound	30	100	25	75	55	91.7
Lack of recovery	0	0	5	25	5	8.3
Total	30	30	30	100	60	100

Table 2. Mean recovery period of patients with bed sore in the two groups of treatment with fish oil and placebo

Group	Recovery period*	No.
Treatment	71.2 (12.6)	30
Placebo	29.8 (27.3)	25
Total	100 (36.8)	55

* Values are expressed as mean (SD).

Sajadi et al.[11] as well as Matushevskaia et al. showed that fish oil could recover stomach and duodenum ulcers.[15] Fish oil rich of omega-3 fatty acids may act through growth factors like cytokines, because other researches have reported that fish oil that is rich in DHA and FAP, could increase mRNA relating to growth factor trams formation (TGF-B) and the protein in the mice spleens.[16] Also, fish oil can stimulate the cytokine effects (growth factors), by stimulating the active of receiving tissues,of these substances[11] other probable reasons of fish oil effect are: increasing the survival of monocytes (since monocytes have principle role against attacking pathogen factor and eliminating infectious findings and thus could have their role in recovering and reproduction of wounds). Producing collagen, controlling the inflammation process of the ulcer, reduce in controlling the collection of platelets, reducing the vessels answer to contracting factor of the vessels, widening the vessels and increasing blood flow and taking oxygen to the wound location, increasing cells reproduction, increasing cells distinctions, increasing the discharge of growth hormones, speeding up reproduction of vessels.[17-20]

It is also reported that vitamin A, existing in fish oil has an important role in rapid recovery of the ulcer; perhaps the existence of this vitamin as a recovery factor is due to fish oil. The possibilities are also considerable.

We found fish oil and omega-3 fatty acids to have positive effects on the recovery of ulcers. In contrast, other reports have implied no useful effects of fish oil in wound recovery. For instance, Jafari Naveh et al. showed that supplementation with fish oil had no effects on recovery of skin wounds in rats.[21] Similarly, Ormerod et al. showed that taking fish oil cannot affect cornea wounds in rabbits.[22] Sukumar et al. suggested that a diet containing fish oil has no effects in recovery of ileum ulcer.[23] A survey by Albina et al. indicated that diets including fish oil produce certain disorders in skin ulcers in the mice.[24] Therefore, more investigations should be performed to clarify the effects of fish oil on skin injuries.

Conclusion

It seems over ally that fish oil ointment and even consuming fish itself which is a gift from the sea, and rich in omega-3 fatty acids, is effective in treating the pressure ulcers and these useful results might introduce a new group of substances or topical medicine, in which fish oil omega-3 fatty acids are used.

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