

Treatment of Diabetic Foot Ulcer With An Epidemiological Approach: A systematic Review Study

Zahra Shiri¹, Zeinab Zarinzade¹, Mohammad Khalilikia², Ahmad Aslani², Hadi Kianirad^{2*}, Yones Adish²

¹Student Research Committee, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

²Student Research Committee, Dezful University of Medical Sciences, Dezful, Iran.

ABSTRACT

Introduction: Diabetes is a very dangerous disease in the new age, and foot ulcer is one of its complications. If the foot ulcer is not quickly and properly treated, it may lead to amputation. Therefore, due to the importance of this issue, this systematic review was conducted with the aim of determining the treatment of diabetic foot ulcer with an epidemiological approach.

Materials and Methods: The present study is a systematic review study that sought scientific articles in search engines, sites, and databases. This study, using the articles published over the past 24 years, has been associated with effective treatments for the accelerated healing of diabetic foot ulcers. In the first phase, 36 articles were found. of these, 12 articles related to the topic that was published in the last 24 years were reviewed.

Results: In this study, several methods for the treatment of diabetic foot ulcers have been investigated. One of these methods that work in the treatment of foot ulcers is the "air cast diabetic walker boot" that inflates the airbag inside the boot to reduce stress on the skin. It has a hard outer cover and a deep heel that lowers the pressure.

Conclusion: In the studies that have been studied, several therapeutic methods have been used to diabetic foot ulcers that have been effective. Considering that serious measures have been taken around the world to reduce complications of diabetes, including foot ulcers, but diabetes research centers in various countries and researchers working on diabetes must have serious plans to reduce complications of diabetic foot ulcers design and implement.

Keywords: Foot ulcer, Diabetic patients, Diabetic foot ulcer, Epidemiologic approach, Diabetic foot ulcer treatment.

Introduction

Diabetes mellitus is considered as the most common disease caused by metabolic disorders and is a major global challenge. It is a disorder of insulin production and function disorder, which has led to an increase in uncontrolled outbreaks due to decreased physical activity and the consumption of unhealthy foods. (1-9). In 2012, the direct cause of diabetes was 1.5 million deaths, with an inappropriate combination (low physical activity and unhealthy diet) leading to an uncontrollable increase in the prevalence of diabetes in the world, and in 2014, the global prevalence of diabetes among adults over the age of 18 The year was estimated at 9%. (19-19) and the prevalence of this disease in Iran, according to the statistics released by the health department of the Ministry of Health in a population over the age of 30, is more than 14% or more in the female population, and it is associated with multiple short-term and long-term complications, which in many

cases is not reversible and there are many complications such as blindness, neuropathy and cardiovascular discomfort (20-38).

In diabetic patients, depression is one of the most common psychiatric disorders that depression is a mood that involves rage and escapes from activity or unconsciousness and reluctance, and can affect one's thoughts, behavior, feelings and health, and well-being. Depression is one of the most common and debilitating problems for youth and adolescents. And depression and occupational stress may cause some disorders in the mental and physical health of individuals, and high occupational stress is known as a known psychosocial factor in the development of cardiovascular disease (39-45). And diabetes is one of the most common endocrine complications in thalassemic patients, and thalassemia is a hereditary condition of the disease and occurs in both alpha thalassemia and beta thalassemia. Beta-thalassemia is a group of hereditary blood disorders caused by the reduction of synthesis of beta-hemoglobin in the blood chain. The annual incidence of symptomatic cases of this disease is estimated at one in 100,000 worldwide (46-54).

A foot ulcer is a major complication of diabetes mellitus with high morbidity, mortality, and associated costs, and therefore necessitates precautionary measures against diabetes mellitus (9). Therefore, due to the importance of this issue, this systematic review was conducted with the aim of determining the treatment of diabetic foot ulcer with an epidemiological approach.

Materials and Methods

In order to achieve the goal of the study and to improve the accuracy of its study and its comprehension, this integrated review study was conducted based on the Broome method. This method is carried out in three stages of the search of texts, data evaluation and data analysis, so that in the search phase, the texts of post-retrospective studies are examined in four stages in terms of inclusion criteria and after obtaining entry conditions The content of the study is evaluated and the data is analyzed at the end.

The present study is a systematic review study that was conducted in Persian and English by searching articles in search engines, scholar, Embase, ScienceDirect, PubMed, and Springer in the search engines, sites, and databases. Using the published articles in the last 24 years regarding the treatment of diabetic foot ulcer with an epidemiological approach. In the first phase, 36 articles were found. Of these, 12 articles related to the topic that was published in the last 24 years were reviewed.

The studies studied were written in English or Persian, access to their full text was possible, and entered the study, and unnamed, unannounced and non-academic studies were deleted.

To achieve relevant studies, a wide range of keywords including foot ulcer, diabetic patients, diabetic foot ulcer, epidemiologic approach, and diabetic foot ulcer treatment was used as a one-to-one search, combined with the method "And" and "OR".

Result

A foot ulcer is a major complication of diabetes mellitus with high morbidity, mortality, and associated costs, and therefore necessitates precautionary measures against diabetes mellitus (9). Therefore, due to the importance of this issue, this systematic review was conducted with the aim of determining the treatment of diabetic foot ulcer with an epidemiological approach.

In this clinical trial, conducted by Kargar et al. With the aim of determining the effect of platelet gel in the treatment of diabetic foot ulcers, 35 patients were treated with platelet gel and 35 subjects were treated with routine. Both groups received intravenous antibiotics (Metronidazole and ceftriaxone), patients were evaluated for three weeks, there was no case of amputation in the platelet gel treatment group, and in the control group, foot ulcers in 6 patients resulted in limb amputation. (55). In another study, patients were randomly divided into two groups of light and laser lasers (placebo), 12-session laser therapy for 4 weeks with low-power laser gallium, aluminum. Low-level laser radiation is non-contagious on the surface of the lesions, changes in the area of lesions as the main outcome after treatment and up to the fourth month of

follow-up were evaluated (56). Also, in one study, the decrease in the mean area of the wound surface after treatment in the experimental group was higher than that in the control group, and as a result, when compressive suction treatment with the appropriate care of the foot ulcer was combined, it increased the repair of foot ulcer Diabetic (57).

Also, in a recent study, in the treatment of chronic wounds of grade 3 diabetes mellitus based on Wegener's classification, ultrasound waves of low frequency with standard care of the wound compared with standard care from the wound alone initially caused Accelerated recovery of chronic diabetic foot ulcers especially in the second and third months, while after 6 months of follow up, there was no significant difference in wound healing (58). In a study that aimed to report a case of diabetic foot ulcer treatment with topical administration of honey and olive oil, it was recommended that the patient first wash the wound completely with the serum and then place the mixture on a sterile gas and The wound was placed on the site and the dressing was replaced every 24 hours. After 5 days, granulation tissue was developed in the wound and the wound was completely recovered during one month (59). Also, in a study that aimed to report a case of diabetic foot ulcer treatment using heat-treated lambs in olive oil, the patient had a 1 cm incision at the interstitial wound, which, after referral, Penicillin powder and rinse with iodine were stopped and treated as daily dressing with topical mixture of heat-treated lambs in olive oil and animal oil, and the patient was advised to wash her wounds before dressing with serum and then Place the topical mixture on a sterile gas and place it on the wound and apply the bandage once every 12 hours. One week after starting treatment, new tissue was observed in the wound and the ulcer was completely closed within 2 weeks. The result is that the heat-treated wax in olive oil and animal oil is suitable for the treatment of diabetic foot ulcers (60).

In a study on 7 patients with type 2 diabetes with Wagner's 2 and 3 wounds, red radiation of 660 Nm to the scar tissue and infrared 980 nm around the wound and red invertebrates with infrared lasers to some of the medical sites Needles for 5 to 10 days a day and then 2 times a week until complete wound healing repairs these wounds that have not recurred after 6 months (61). In a retrospective study on 48 patients before and after treatment, immersion ultrasound of necrotic tissue was debrided and the wound surface decreased and granulation tissue increased, and the rate of wound healing without scar formation and Slough was also higher (62). Another way to treat foot ulcers is to use an air cast diabetic walker boot to inflate the airbag inside the boot to reduce pressure on the skin, and also has a hard outer sheath and a deep heel that lowers the pressure (63). Another method that replaces the two-layer human skin that is used to treat intravenous ulcers and diabetic foot ulcers is Apligraf (64). In a clinical trial, tretinoin 0.5% solution for 10 minutes daily followed by iodine gel for 4 weeks was effective in wound healing than the control group (65). The results of this study showed that the effect of cold plasma radiation and endurance training did not significantly improve the wound healing in diabetic rats, but a period of endurance training and cold plasma also had a significant effect on wound healing in diabetic rats (66).

Discussion

Diabetes mellitus is considered as the most common disease caused by metabolic disorders and is a major global challenge. It is a disorder of insulin production and function disorder, which has led to an increase in uncontrolled outbreaks due to reduced physical activity and the consumption of unhealthy foods. (1-9). A foot ulcer is a major complication of diabetes mellitus with high morbidity, mortality, and associated costs, and therefore requires precautionary measures against diabetes mellitus (9). Therefore, due to the importance of this issue, this systematic review was conducted with the aim of determining the treatment of diabetic foot ulcer with an epidemiological approach.

In a study to determine the effect of platelet gel on the treatment of diabetic foot ulcers, it can generally be concluded that this study showed that platelet gel dressing was effective in the treatment of diabetic foot ulcers (55). Platelet growth factors are biologically active substances that accelerate the tissue repair



mechanism such as chemo-toxicance, cell proliferation, angiogenesis, and extracellular matrix sedimentation. Also, at the site of tissue damage, platelets release mitogenic and inflammatory materials that cover all aspects of tissue repair. In a study to determine the role of laser therapy in the treatment of diabetic foot ulcers on diabetic patients, showed that laser therapy can be effective in accelerating the healing of diabetic ulcers (56). The laser works with several mechanisms in these cases. In the first stage, vasodilatation increases the blood flow in the region, it also helps to destroy microorganisms in infectious wounds that strengthen the immune system. Another study also found that compressive suction treatment with the appropriate care of foot ulcers would increase the healing of diabetic foot ulcers. Therefore, it is recommended that patients with diabetic foot ulcer and chronic wound healing without recovery should use Vascular compression therapy for wound healing and organ preservation (57). In one study, with the aim of reporting a case of diabetic foot ulcer treatment with topical administration of honey and olive oil, after 5 days from the onset of treatment, granulation tissue was developed in the wound and the ulcer was completely improved within one month (59).

Conclusion

In the studies that have been studied, several therapeutic methods have been used to diabetic foot ulcers that have been effective. Considering that serious measures have been taken around the world to reduce complications of diabetes, including foot ulcers, but diabetes research centers in various countries and researchers working on diabetes must have serious plans to reduce complications of diabetic foot ulcers design and implement.

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Conflict of interest:

There are no conflicts of interest in this study.

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