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Diabetic Foot Ulcer (DFU) and Its Pharmaceutical and Therapeutic Strategies: A Systematic Review

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ABSTRACT

Introduction: One of the complications of diabetes is diabetic foot ulcers which is very common in these patients. Given that in Studies, found that diabetic foot complications increase with age. Therefore, considering the importance of diabetic foot ulcer treatment in diabetic patients, this systematic review was conducted on Diabetic foot ulcer (DFU) and Its pharmaceutical and therapeutic strategies.

Materials and Methods: In this systematic review, this integrated overview study was conducted based on the Broome method. The present study is a systematic review article that was conducted in English and Persian by searching articles in search engines, scholar, PubMed, Springer's reputable scientific sites and databases. Using the articles published in the last 20 years, it was based on the most important treatments for diabetic foot ulcers. In the first stage, 39 papers were found. Of these, 11 articles related to the topic that was published in the last 20 years were reviewed.

Results: In this study, several methods for the treatment of diabetic foot ulcers have been investigated. In a study, in the treatment of chronic ulcers 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 scarring 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.

Conclusion: In this study, as stated, our goal is to examine diabetic foot ulcer and their therapeutic and therapeutic strategies, that the results of various studies show that there are several therapeutic and therapeutic methods for treating diabetic foot ulcers. It is recommended that with screening and blood glucose control, prevent ulcers that cause amputation of the foot.

Keywords: Diabetic Foot Ulcer, Diabetic Patients, Therapeutic Strategies, Pharmaceutical

Introduction

Diabetes is a dangerous and metabolic disease of the last century that is characterized by chronic hyperglycemia and can cause damage to various organs of the person. And because of the increasing number of people with the disease, it has become a major public health problem in the world (1-8).

Currently, the prevalence of type 2 diabetes in Iran is reported to be 7.7%, which is estimated to reach 8.6% by 2025. A foot ulcer is a major complication of diabetes mellitus with high morbidity, mortality, and associated costs (9-11).
Foot ulcers are frequently infectious in diabetic patients and have the potential to progress to cellulite, and if not treated promptly and appropriately, can lead to blood and gangrene infections and sometimes lead to amputation. Preventive measures for diabetic foot, therefore, include identifying people with risk factors for foot ulcers, educating the patient and their companions about foot care, and appropriate and comprehensive treatment of foot ulcers (9), (12-16).

Chronic skin ulcers in diabetic patients usually occur in the lower extremities, especially the foot, which affects 15% of diabetic patients. A diabetic foot ulcer is the most common reason for hospitalization of diabetic patients (17, 18).

Diabetic foot ulcer has a profound effect on the quality of life of patients and imposes a huge burden on health care providers. Diabetic foot ulcers cause lower-extremity amputation in 85% of cases. Also, the mortality rate in diabetic foot ulcer patients compared to other diabetic patients is equal (19, 20).

Given that in the study by Al-Rubeaan et al (21) and Vilma et al (22) also found that diabetic foot complications increase with age. Therefore, considering the importance of diabetic foot ulcer treatment in diabetic patients, this systematic review was conducted on Diabetic foot ulcer (DFU) and It's pharmaceutical and therapeutic strategies.

Materials and Methods

The present study is a systematic review article that was conducted in English and Persian by searching articles in search engines, scholar, PubMed, Springer's reputable scientific sites and databases. Using the articles published in the last 20 years, it was based on diabetic foot ulcer (DFU) and pharmaceutical and therapeutic strategies. In the first stage, 39 papers were found. Of these, 11 articles related to the topic that was published in the last 20 years were reviewed.
In this systematic review, this integrated overview study was conducted based on the Broome method in order to achieve the goal of the study and to improve the study's thorough understanding and comprehension. This method is carried out in three stages of the search of texts, data evaluation, and data analysis so that in the search stage, the texts of post-retrospective studies are examined in four stages in terms of inclusion criteria. After obtaining the conditions for entry into the study, the content of the study is evaluated, and at the end of the analysis of the data.

The studies studied were written in English or Persian, access to their full text was possible, that entered the study, and unnamed and non-academic studies were deleted. To achieve relevant studies, a wide range of keywords including Diabetic Foot ulcer, Diabetic patients, therapeutic strategies and pharmaceutical was used as a one-to-one search, combined with the method "And" and "OR".

Results

Chronic skin ulcers in diabetic patients usually occur in the lower extremities, especially the foot, which affects 15% of diabetic patients. A diabetic foot ulcer is the most common reason for hospitalization of diabetic patients (17, 18).
In this review study, we intend to investigate diabetic foot ulcers and their therapeutic and therapeutic strategies by investigating 11 studies.

In one study, the patient was advised to wash the wound thoroughly with a serum first, then place the mixture on a sterile gauze and place it on the wound and apply the dressing every 24 hours, then five days thereafter. After treatment, granule tissue developed in the wound and the wound healed completely within a month (23).
In another study, laser therapy was performed for 12 sessions over a 4-week low power laser, aluminum laser. Low-level laser radiation is non-contact with the lesion surface; changes in the lesion area were monitored and evaluated as the primary outcome after treatment and by the fourth month (24).

In a study, 35 patients with platelet gel and 35 subjects received routine treatment to determine the effect of platelet gel in the treatment of diabetic foot ulcers. There was no indication of amputation in the platelet gel treatment group. In the control group, foot ulcers in 6 patients resulted in limb amputation (25).

In another study, ultrasound waves of low frequency with standard care of the wound compared with standard care from scarring 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 (26).

Also, in a study that aimed to determine the effect of compressive-suction treatment (VCT) on foot ulcer healing in diabetic patients, when the treatment of Compressive suction with the appropriate care of the foot ulcer will increase the repair of the diabetic foot ulcer (27).

In another study, red light radiation around the wound and red intravenous light with an infrared laser to some acupuncture points for 5 to 10 days a day and then 2 times a week until complete recovery Wounds have been repairing these wounds (28).

Also, in a study, penicillin powder and rinse with betadine were stopped and treated as a daily dressing with topical mixture of heat-treated lambs in olive oil and animal oils, after a week after starting treatment, the new tissue was observed in the wound and the ulcer was completely closed within 2 weeks (29).

In another study, immersion ultrasound was debrided to necrotic tissue and the wound surface decreased and granulation tissue increased and wound healing improved without scar formation (30).

Other findings of the study showed that a period of cold endurance and plasma training had a significant effect on wound healing in diabetic rats. This is the first time that cold plasma stability and treatment have been used to improve diabetes Together, they significantly accelerate wound healing in diabetic rats (31).

Apligraft is another method that replaces the two-layer human skin that is used to treat intra venous ulcers and diabetic foot ulcers (32).

In a clinical trial, tretinoin 0.5% solution for 10 minutes daily followed by gel iodine for 4 weeks was effective in wound healing than the control group (33).

Discussion

Diabetic foot ulcer has a profound effect on the quality of life of patients and imposes a huge burden on health care providers. Diabetic foot ulcers cause lower-extremity amputation in 85% of cases. Also, mortality rate in diabetic foot ulcer patients compared to other diabetic patients is equal (19, 20).

Given that in the study by Al-Rubeaan et al (21) and Vilma et al (22) also found that diabetic foot complications increase with age. Therefore, considering the importance of diabetic foot ulcer treatment in diabetic patients, this systematic review was conducted on Diabetic foot ulcer (DFU) and It's pharmaceutical and therapeutic strategies.

According to study, penicillin powder and rinse with betadine were stopped and treated as a daily dressing with a topical mixture of heat-treated lambs in olive oil and animal oils, after a week after starting treatment, the new tissue was observed in the wound and the ulcer was completely closed within 2 weeks (26).

The laser works on a number of mechanisms, firstly, the dilation of the vessels increases circulation in the area, helping to strengthen the immune system by destroying microorganisms in infectious wounds, and ultimately by strengthening the immune system. The process of healing the tissues strengthens the wound healing.

Another study aimed to determine the effect of compressive-suction treatment (VCT) on foot ulcer healing in diabetic patients, which according to the results suggests that patients with diabetic foot ulcers and chronic ulcers without improvement, for wound healing and limb restoration Use the most sophisticated pressure-saving treatment (27). Also in a similar study, a randomized clinical trial was performed to evaluate vacuum compression (VCT) to improve diabetic foot ulcers. Eighteen diabetic patients with foot ulcers were used by simple indirect sampling. Subjects were randomly divided into either experimental or control groups. Before and after the intervention, the level of foot ulcers was estimated serologically based on the Cavalieri principle. The experimental group was treated with VCT in addition to the usual treatment for 10 sessions. The control group received only conventional treatment including debridement, blood glucose control drugs, systemic antibiotics, wound healing with normal saline, discharge (pressure reduction), and daily wound dressing. After treatment, the experimental group significantly improved in measures of foot ulcer surface area compared with the control group. VCT enhances diabetic foot ulcer healing when combined with appropriate wound care (34).

Conclusion

In this study, as stated, our goal is to examine diabetic foot ulcer and their therapeutic and therapeutic strategies, that the results of various studies show that there are several therapeutic and therapeutic methods for treating diabetic foot ulcers. It is recommended that with screening and blood glucose control, prevent ulcers that cause amputation of the foot.

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