

Larvaterapy: How To Manage The Diabetic Foot

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ABSTRACT: *The aim of this article is to analyze texts based on levels of scientific evidence, using a meta-analysis methodology through a systemic review. The search will be carried out using keywords that apply "larvatherapy", "diabetic foot", "ulcers", "debridement" and "nursing", focused on clinical practice by the nursing professional. The database and information sources consulted will be: Google Scholar, DOAJ, SciELO, Scopus, LILACS, PubMed. The collection of articles were those written in Spanish, with a span of 10 years, in which 15 articles with a direct relationship between the topics were evaluated, in order to increase the scientific production in research by nursing personnel and to resume the management of Larval Therapy as a treatment alternative, through its academic, professional and labor fundamentals. Worldwide, Diabetes Mellitus is considered an affection with negative complications in the diabetic foot in which infections affect the prognosis of wound healing, where larval therapy is considered an alternative treatment, which avoids surgery and amputation in lower extremities, effectively helping the removal of necrotic tissue, formation of granulation tissue and rapid healing. The effectiveness of the treatment will depend on the pathogenic triggering mechanisms in the patients. The needs required by the population are increasingly scarce due to the high costs in the health sector in care and treatment, so it is important to consider Larval Therapy (LT) as an alternative to treatment, since it reduces the increase in hospital capacity avoiding infections associated with health care.*

KEYWORDS: larvatherapy, diabetic foot, ulcers, debridement, nursing.

INTRODUCTION

Larval Therapy is an alternative treatment for the management of the diabetic foot, it is part of the alternative therapies and is focused on and be part of one of the options that nursing

and health care personnel can use in order to reduce it on progressive load. work, advance highly efficient treatment alternatives through research, improve quality of life and minimize possible complications, whether mild or critical, such as amputations. Patients with Diabetes Mellitus (DM) have a relative risk of suffering a lower limb amputation 10 to 20 times higher than a person who does not have the disease, due to the presence of an ulcer or previous lesion, associated with neuropathy with or without disease. peripheral arterial, this situation being known as diabetic foot (WHO, 2020). Diabetic foot disease (DFT), understood not only as an advanced situation where the patient with DM presents a complicated lesion, but also the risk of ulceration, entails great suffering for the patient, a considerable burden for the family, health professionals, nursing, health services and society in general (IWGDF, 2020).

A wound is an injury that breaks the skin or other body tissues, which may be: muscles, different types of organs, subcutaneous tissue, etc. There are various types of wounds (acute, chronic, internal, external), each of which requires a different treatment. Within the external ones, those that require a longer healing time and complexity are called chronic wounds, in these wounds the healing process is much more tedious, where their complete remission can last months or even years, often leading to serious conditions or fatal (Hernández, 2022). The presence of necrotic and devitalized tissue in chronic lesions exacerbates and prolongs the inflammatory process.

The necrosis process indicates that the cells are not receiving the necessary blood supply, accumulating bacteria in the wound, which is why the process of removing this tissue for its recovery is considered the first stage (Mosquera, 2010). The difficult healing of a wound is due to the diversification of physiological aspects such as; extension, insufficient blood supply or oxygenation, infection of pathogens, pathological Diabetes Mellitus. Psychosocial; health personnel, nutritional status, economic that determining the complexity of wound healing. Therefore, it is necessary to comprehensively assess the appropriate method of adequate treatment through studies (Hernán, 2013).

Within the healing process the wound comprises 5 phases:

- Hemostasis.

It begins after the injury, in the affected area, the vessels contract to stop the bleeding, it is then when the platelets join each other to form a plug (vasoconstriction), stopping the bleeding, and later producing fibrin, a protein necessary for blood coagulation.

- Inflammation.

For the correct healing process, the area must present a slight inflammation (as long as it

depends on the type of wound), a fact that does not mean infection at all, since it is motivated by two events in the healing process. This is due first of all to leukocytes, which, with the help of their cells, neutrophils and macrophages, begin to clean the area of debris, dead tissue and pathogens. And secondly, to platelets that release mediators, such as growth factors, to complete the healing process.

- Formation of granulation tissue (repair of the dermis).

Fibroblasts, cells that contribute to the formation of connective tissue, head towards the injured tissue, once there producing collagen (a protein that helps maintain the structural framework of tissues). Fresh connective tissue is formed that fills in the lesion and is called granulation tissue, thus forming new blood vessels, which are called angiogenesis.

- Epithelization (formation of a new epidermis).

In order to restore the barrier function of the skin, it is necessary for keratinocytes (chief cells of the epidermis) to be directed from the edges of the wound and hair follicles to heal the wound.

- Remodeling of scar tissue.

Depending on the type of injury that occurred, it will have one type of scar or another, being in some cases insufficient or excessive and may require years for the remodeling process, accelerating this process with pressure and increased temperature (Arenas, 2003). The healing process is a repair process whose objective is to replace the injured tissue with another of new formation and functionality, by repairing and regenerating the damaged tissue (Villamil, 2009).

Currently there is a wide variety of debridement methods of variable efficacy, these include surgical, mechanical, sharp, enzymatic, autolytic, osmotic and larval. It is often productive to evaluate the combined application of more than one type of debridement based on the general condition of the patient (Mosquera, 2010). The larval method as a result is one of the most striking for its application with contributions in historical-relevant background since the First World War. The pioneer of this therapy was the orthopedic surgeon William Baer, who carried out and documented different clinical cases during the First World War, among them; 4 children with osteomyelitis and more than 70 patients with chronic ulcers in the lower limbs (MMII) (Baer, 2011).

Larval Therapy: It is an alternative technique known as biological debridement, through the application of green bottle fly larvae, scientifically known as "Lucilia sericata" reared in a controlled, sterile laboratory to recover the wound bed. These sterile larvae secrete a series of proteolytic enzymes capable of degrading the necrotic layer of the wound (Maté, 2022).

As the main benefits of this technique, the larvae act only on necrotic tissue, promoting cell activity and acting as an antimicrobial agent, being profitable and easy to use for nursing staff.

Currently, this therapy is used in various countries, such as Germany, England, Switzerland, Sweden, Ukraine, Australia, Thailand, USA, Chile, Argentina, Mexico, Brazil, Peru, Israel and Canada. However, in Spain, only completed or ongoing research studies are available because, despite being approved by the Spanish Agency for Medicines for Patients, its application is only allowed as experimental use, after the patient's prior report and consent (Serra, 2016). The Manuel Gea González General Hospital, in Mexico City, highlighted the use of this technique as an effective method to treat diabetic foot and wounds that do not heal quickly. It was the first institution in Latin America to use larvae for the management of wounds in patients, a technique used in wounds with the presence of necrotic tissue, based on larvae for medical use and produced in such a way that they are sterile.

Currently, thanks to advances and their application, there are two types of techniques; the direct application of larvae, which consists of washing the bed of the wound, protecting the area surrounding it, special care must be taken once they are placed in the wound, since a nylon mesh and a bandage will be placed over them, not applying too much pressure to avoid the death of the larvae.

Larvae dressings that, thanks to their application, have developed better adhesives and synthetic fabrics, such as one-piece dressings that save time in wound healing. This technique prevents the larvae from escaping, thus reducing the patient's anxiety, and makes the technique easier, by only changing the dressing. The drawback of this technique is that the debridement process is less effective, since the larvae are not applied directly. Larval Therapy, like any type of treatment, has a series of indications and contraindications for its application. For its application it is indicated in patients with: diabetic foot ulcers, venous ulcers, arterial / ischemic ulcers, pressure ulcers, post-traumatic wounds, necrotizing fasciitis, gangrenosum pyoderma, osteomyelitis, surgical infections, ulcers of neoplastic origin and burns. As a contraindication, it is not allowed in patients diagnosed with dry, open wounds connected to body cavities and close to large-calibre blood vessels. (Shi, 2014) Its mechanism of action of this therapy is that it provides beneficial properties such as debridement, disinfection and growth stimulation in a fast, effective and simple way. (Shermann, 2014)

METHODOLOGY

Design

This is a quantitative descriptive study, through the structured review of scientific articles in

Spanish, on larval therapy, as management of diabetic foot. Trying to get from the data collection analysis and conclusions based on the field of health sciences in which inclusion and exclusion criteria were implemented.

Population

Articles published in Spanish in different databases.

Criteria

All types of studies: (bibliographic reviews on index platforms, clinical studies, meta-analysis, cross-sectional studies, case studies). Studies based on the human being such as: Nursing manuals in the management of diabetic foot wounds, clinical cases and treatment of larval therapy in diabetic foot. Period: Recent publications of the last 10 years. Language: Scientific articles in Spanish were collected. Article accessibility: Free articles.

Ethical aspects

The search and compilation was based on the scientific validation of the evident information for the improvement of health, providing theoretical and normative foundations for the restructuring of the investigation, protecting the rights without plagiarism.

RESULTS

Research practice for the professional discipline of nursing is a fundamental tool, derived from the needs of the health-disease process. Dealing with the systemic investigation of pathological problems that exist within professional practice.

Diabetes Mellitus (DM) in adults is a pathology with a high incidence in the world, generating complications such as diabetic foot and developing collateral damage through the formation of wounds, which leads to the amputation of lower limbs in users.

Larval therapy or larvotherapy (LT), also considered biosurgery, is a highly effective method or technique for the management of debridement in wounds, through the use of medical grade "Lucilia Sericata" necrophagous fly larvae.

In Mexico, research practice is precarious due to technological advances in health, significantly affecting the professional development of nursing, since research is essential for the development, foundation, contribution and evidence of documentation for professional practices in nursing.

The management of larval therapy fell into disuse due to the innovation of consumable

materials and the appearance of antibiotics for wound management.

DISCUSSION

Acuña (2011), The type of insect used for biosurgery treatment is the green metallic fly with the scientific name "Lucia sericatta" which is considered medical grade due to its biological cycle and the great beneficial contributions since ancient times. in the area of health, in which it stands out for its unique feeding of dead or necrotic tissue as it is directly applicable to wounds in a natural, simple and safe way, without harming healthy parts of the body. Due to its great index of geographical distribution in the world, it is possible to captivate the necrophagous species, to be usable and applicable in health processes due to predetermined complications of Diabetes Mellitus type II.

As we well know, Type II Diabetes Mellitus is a chronic degenerative disease that with the passage of time and poor treatment and self-care management can cause irreversible and irreparable damage to health, causing complications such as diabetic foot. Navarro (2018), I use the larvotherapy technique and plasma therapy in patients with diabetic foot for the treatment of grade 3 ulcers, where he establishes that the recovery process with these two techniques is much faster than pharmacological treatments, it is important It should be noted that by placing the larvae directly on the lesions, the process of degradation of the areas which present the ulcers is much greater, since it acts in situ, allowing recovery in less time, unlike the pharmacological processes that have to follow the pharmacokinetics and pharmacodynamics to be able to act on the site and these depend on the physiological and pathological characteristics in which the patient is.

This innovative health strategy as an alternative therapy presents Larvotherapy or Biosurgery as an option to debridement in the presence of cases that are difficult to approach in the management of chronic wounds. At present, wounds occupy a high percentage of service demands in hospital and out-of-hospital, where the nursing staff is responsible for coping with various situations and, given their professionalism and vocation with the fulfillment of their essential actions, tends to seek these health promoting strategies. The communication between the nursing staff and the patient is an essential part of being able to transmit trust and thus be able to resume these treatment alternatives by the nursing staff that are oriented to the practices of the nursing process and that lead to a diagnosis. which is a predictor of nursing interventions.

According to Cifuentes (2018), the systematized and established design that was carried out, through breeding, speciation and ovo position of the lucilia Sericata type of fly, is considered a design with satisfactory results, according to the characteristics of the species it was applied

as clinical evidence, obtaining successful results in the process of debridement and removal of necrotic tissue, acquiring the formation of granulation tissue, decrease in secretions and foul odor.

Through the evaluation and treatment for the proper management of the diabetic foot, larval therapy is established as an effective local treatment, which helps to remove necrotic tissue, in which the larvae secrete enzymes through their metabolic process, eliminating microorganisms and reducing infectious processes. Therefore, adequate treatment and management is of the utmost importance in diabetic foot ulcers, since it is considered one of the major public health problems in the world due to the high neuropathic, arterial and vascular compromise, mainly in the soft parts of the foot in patients with diabetes. users, attributing to the comparison of time and high treatment costs, we can consider that this therapy is more viable due to its premature, natural effectiveness and that it does not generate collateral damage to the health of patients.

The application of larval therapy was displaced by the advent of antibiotics which are used to cure various infections caused by microorganisms in the diabetic foot and in various affectations, Ríos (2013), the high complexity in the face of the resistance of microorganisms to antimicrobials led the health sector to resume Larval Therapy. Therefore, they observed that antimicrobials put efficacy, prevention and treatment at risk, resulting in ineffectiveness. The great difficulty to develop new antibiotics is generated because microorganisms undergo various changes when exposed to antimicrobials, threatening the health of patients. Currently Larval Therapy is used for the removal of necrotic tissue which contains dead cells and detritus which are the result of the destruction of tissue and cells, favoring the formation of granulation tissue for the healing process and protects against infections. caused by microorganisms.

Gentil (2009), through the review of the scientific literature that was carried out for the evaluation of Larval Therapy, is considered efficient in three great aspects: debridement, elimination of microorganisms and healing through stimulation, generating granulation tissue.

Larval Therapy according to various studies is not considered a health risk, however, patients to whom this therapy was applied mention pain as a specific symptom or adverse effect. According to the International Association for the Study of Pain (IASP), chronic pain is pain that lasts longer than three months and is considered a brain disease, which can lead to rejection, therapeutic failure, or well complications that impair the healing process. The problem that is established is that the treatment will depend on the sensory-emotional experience and the tissue damage that the patient presents. Proper pain management does not

present collateral damage, since we can say that pain is associated with the vast majority of pathological diseases and that it is constantly present before the application of treatments.

At present, the reluctance shown to the management of Larval Therapy by professionals through its application and acceptance by patients, is associated with the sociocultural and psychological aspects of people, where religion limits health processes. disease, the negative connotation shown to the word "larva or worm" generates objective symptoms such as: fear, suspicion, disgust, rejection and insecurities, establishing an imposition for the acceptance of therapy. Mendez, (2016).

Ramirez, (2019). Another of the big problems is the scarce information and foundation of the therapy, by the nursing staff, since research is essential to contribute, develop and expand new knowledge in the different areas of health. Through research it is possible to document the importance of evidence-based nursing. The result that is expected is a timely management of information by health personnel, to publicize the importance of biotherapy and can be approved by the different health sectors in the world and therefore in the user, taking into account Participation in decision-making about their treatment counts for maintaining the quality of life of patients.

CONCLUSION

Larval Therapy or larva therapy (TL) is a therapy that due to the lack of scientific information has lost its research foundations. Within the basic functions of nursing, we can say that research, assistance, teaching and management are essential parts to provide timely care of quality and warmth, to safeguard the integrity of patients and thus improve the quality of life. This therapy fulfills the necessary functions to be applicable in patients with chronic degenerative diseases such as type II diabetes mellitus, in which the management of the diabetic foot is considered a mortality problem in patients, due to the high increase in infections associated with health care and self care.

By reviewing the literature we can say that biotherapy is considered fast and effective since it helps with the removal of dead or necrotic tissue, stimulation of granulation tissue and healing. The adequate management of information through its management and teaching would play an important role for the acceptance by health personnel and users.

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