



ISSN: 2230-9926

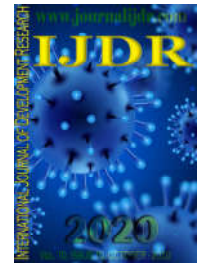
Available online at <http://www.journalijdr.com>

IJDR

International Journal of Development Research

Vol. 10, Issue, 10, pp. 41726-41730, October, 2020

<https://doi.org/10.37118/ijdr.20293.10.2020>



RESEARCH ARTICLE

OPEN ACCESS

CLINICAL ASPECTS RELATED TO INFECTION IN PATIENTS WITH CHRONIC WOUNDS

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ARTICLE INFO

Article History:

Received 11th July, 2020
Received in revised form
19th August, 2020
Accepted 06th September, 2020
Published online 30th October, 2020

Key Words:

Wounds and Injuries; Healing;
Wound Infection; Nursing.

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ABSTRACT

Objective: describe the clinical aspects related to infection in chronic wounds. **Materials and methods:** cross-sectional study, focusing on the prevalence of infection in chronic wounds. The sample consisted of 27 patients. In data collection, sociodemographic and clinical characteristics were evaluated. Data analysis was performed in Excel 2013 with Action Stat with descriptive statistics, Shapiro-Wilk and Spearman tests. **Results:** there was a prevalence of men (63.0%, 17/27), elderly (63.0%, 17/27), with multiple chronic diseases (77.7%, 21/27) and venous ulcers (74.0 %, 20/27). The lesions had more than 21 cm² (77.7%, 21/27), superficial depth (81.4%, 22/27), granulation tissue (48.1%, 13/27) and infection (70.3%, 19/27). The correlation between the size of the lesion and the number of clinical signs of infection was statistically significant (p-value: 0.047). **Conclusion:** it points to the possibility of identifying more clinical signs of infection in wounds with a larger area.

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Citation: Bianca Campos Oliveira, Beatriz Guitton Renaud Baptista de Oliveira, Gabriela Deutsch, Fernanda Soares Pessanha, Marcelle Feitosa Lemos Malveira, Camilly Cardoso da Silva and Selma Rodrigues de Castilho, 2020. "Clinical aspects related to infection in patients with chronic wounds", *International Journal of Development Research*, 10, (10), 41726-41730.

INTRODUCTION

Chronic wounds are complex, since both intrinsic factors such as age, nutritional status and underlying diseases (diabetes mellitus and cardiovascular diseases) and extrinsic factors such as trauma, moisture and pressure contribute to their development. These, when inadequately controlled, can cause delays in healing and consequent increases in institutional expenses related to treatment, which makes chronic wounds a public health problem (1-2). It is known that the tissue repair process, commonly composed of the phases of inflammation, proliferation and remodeling, is influenced by this multiplicity of variables. Among them, infections also stand out (3-4), diagnosed clinically when there is the presence of purulent exudate and / or two or more classic signs of inflammation (pain, heat, redness and edema) (5). Wound infections are related to the multiplication of microorganisms that results in

the prolongation of the inflammatory phase and the delay in collagen synthesis, causing tissue damage and compromising epithelialization (6). Therefore, it is necessary to provide comprehensive care, focused on the needs of each patient according to the specificities of each injury. Therefore, professionals are required to have up-to-date technical and scientific knowledge, as well as an understanding of the epidemiological profile of the service in which they operate, which subsidized clinical practices based on scientific evidence (1-2,7). Thus, the aim of this study was to describe the epidemiological, clinical and treatment aspects related to infection in chronic wounds.

MATERIALS AND METHODS

Cross-sectional study, focusing on the prevalence of infection in chronic wounds, carried out in a wound repair clinic at the university hospital (Rio de Janeiro, Brazil).

The sample calculation was based on the population served monthly in the sector (8) following previously proposed criteria (9). The results indicated that 27 participants were necessary to ensure that the sample was representative of the population. Recruitment was done consecutively (10), that is, as the patients attended the nursing consultations at the outpatient clinic, the inclusion criteria were evaluated by the researchers and, if they agreed to participate, they signed the free and informed consent form. Inclusion criteria were: age over 18 years; presence of one or more chronic wounds (venous, arterial, diabetic ulcers, pressure injuries or surgical dehiscences). The exclusion criteria were: suspected or confirmed pregnancy; diagnosis of psychiatric diseases. In this work, causal correlations between epidemiological factors (piped water network, piped sewage, income, marital status and education), clinical factors (size of the lesion area, comorbidities, Body Mass Index) and types of treatment (products used) were carried out.

The data were collected prospectively, from September to December 2015, using an instrument that allowed obtaining sociodemographic, clinical, injury-specific data and signs of infection. The measurement of the lesion area was performed using the planimetry technique (1). The data collection instrument contained items related to: age; sex; income; schooling; marital status; occupation; basic sanitation; medications in use; basic diseases; smoking; alcoholism; anthropometric measurements; hygienic conditions; practice of physical activities; etiology of the wound; time of evolution of the lesion; location, size and fabrics present; exudate; depth; edges and adjacent skin; odor; itching; presence of infection (5) and primary dressings used in dressings. Data analysis was performed using Microsoft Excel 2013 software with Action Stat version 3.1. The data were organized in tables and analyzed using descriptive statistics, including calculation of absolute and relative frequencies. In addition, the data were submitted to the Shapiro-Wilk normality test, which indicated non-normal distribution. Then, the Spearman test was used to verify the existence of a correlation between the variables and the number of clinical signs of infection in the wounds. The results are presented in three categories: Sociodemographic characterization and health history; Clinical evaluation of wounds; Evaluation of wound infection. The study respected the formal requirements contained in the national and international regulatory standards for research involving human beings, being approved by the Ethics Committee in Research with Human Beings of Antônio Pedro University Hospital (n° 1,049,511 of 10/04/2015).

RESULTS

It was found that 63.0% (17/27) of the patients were male, primarily sedentary (96.2%, 26/27) and smokers (66.6%, 18/27). Regarding the regular consumption of alcoholic beverages, there was a certain homogeneity in the sample, since 55.5% (15/27) reported consuming alcoholic beverages regularly. Table 1 shows other sociodemographic and clinical aspects. It should also be noted that 77.7% (21/27) of the patients were inactive with regard to work practices. In addition, 88.8% (24/27) lived in houses with running water and 96.2% (26/27) had a sewage network. It was observed that most of the sample had multiple underlying diseases (77.7%, 21/27). 25.9% (7/27) of the patients had systemic arterial hypertension and chronic venous insufficiency. Another 18.5% (5/27) also had diabetes mellitus in addition to these.

11.1% (3/27) of the participants had systemic arterial hypertension and diabetes mellitus. There was an association of chronic venous insufficiency and sickle cell anemia in 3.7% (1/27) of the cases. The presence of only one chronic disease had the following distribution: 22.2% (6/27) had chronic venous insufficiency; 7.4% (2/27), diabetes mellitus; 3.7% (1/27), systemic arterial hypertension. About 7.4% (2/27) reported no previous diagnosis.

Table 1. Sociodemographic characterization (n = 27)

| | Variables | Absolute frequency / Percentage (%) |
|-----------|---|-------------------------------------|
| Age range | 20 to 59 years | 10 / 37.0 |
| | 60 to 89 years | 17 / 62.9 |
| Income | Less than R \$ 1,000.00 | 9 / 33.3 |
| | Between R \$ 1,001.00 and R \$ 2,000.00 | 12 (44.4) |
| | More than R \$ 2,001.00 | 6 (22.2) |
| Education | Illiterate | 1 (3.7) |
| | Elementary School | 18 (66.6) |
| | High school | 8 (29.6) |
| Diet | Free | 9 (33.3) |
| | Hyposodium | 9 (33.3) |
| | Hypocaloric | 9 (33.3) |
| BMI | 18.5 to 24.9 Kg/m ² | 14 (51.8) |
| | 25.0 to 29.9 Kg/m ² | 7 (25.9) |
| | > 30 to 34.9 Kg/m ² | 6 (22.2) |
| Roam | Normal | 13 (48.1) |
| | With help | 11 (40.7) |
| | Wheelchair | 2 (7.4) |
| | Bedridden | 1 (3.7) |

*BMI: Body mass index.

Table 2. Correlation of sociodemographic and clinical variables with the number of clinical signs of infection in the wounds

| Variable | Spearman's coefficient | p-value* |
|--------------------|------------------------|----------|
| Lesion size (area) | 0.390 | 0.047 |
| Product | 0.270 | 0.180 |
| Comorbidities | 0.150 | 0.450 |
| Body mass index | -0.028 | 0.890 |
| Education | 0.110 | 0.590 |
| Marital status | 0.190 | 0.350 |
| Income | 0.110 | 0.600 |
| Piped water | 0.220 | 0.260 |
| Plumbing sewer | 0.170 | 0.400 |

*: Significance level: 5%.

Most of the wounds were of venous etiology (74.0%, 20/27). The others had their origins in complications of diabetes mellitus (18.5%, 5/27), unrelieved pressure (3.7%, 1/27) and cancer (3.7%, 1/27). With regard to the area, the wounds were primarily more than 21 cm² (77.7%, 21/27), that is, only 22.2% (6/27) were less than 20 cm² in length. The smallest wound was 4 cm², while the largest lesion was 231 cm². Regarding the presence of granulation tissue, it was found that 48.1% (13/27) had their beds primarily granulated. This finding is reiterated when it is observed that the presence of liquefaction necrosis was poorly identified. That is, most injuries (70.3%, 19/27) had this type of tissue covering only up to ¼ of their beds. It is also noteworthy that the presence of coagulation necrosis was rarely found, since only 11.1% (3/27) of the lesions had this type of tissue. The wounds were primarily superficial (81.4%, 22/27). The edges were: macerated in 51.8% (14/27) of the cases; epithelialized, in 37.0% (10/27); hyperemic, in 7.4% (2/27); and hyperkeratosis, in 3.7% (1/27).

The products applied as a primary covering in dressings were mainly silver sulfadiazine (40.7%, 11/27) and 2% hydrogel (40.7%, 11/27). The use of essential fatty acids (14.8%, 4/27) and collagenase (3.7%, 1/27) was also observed. It is also noteworthy that the lesions were, for the most part, without the presence of a foul odor (74.0%, 20/27). Regarding the presence of clinical signs of infection, it was found that, in general, the wounds did not present erythema (70.3%, 19/27) or heat (96.2%, 26/27). On the other hand, 74.0% (20/27) of the patients reported pain in the lesion. Regarding the presence of edema, 55.5% (15/27) of the lesions had it, while 44% (12/27) did not have it. The types of exudate found were: serous (33%, 9/27); purulent (33%, 9/27); serosanguinolent (30%, 8/27); bloody (3.7%, 1/27). There was a prevalence of 70.3% of infection in the evaluated wounds (19/27). Table 2 shows the results of the Spearman coefficient calculations to verify the presence of correlation between sociodemographic and clinical variables with the number of clinical signs of infection in the wounds.

DISCUSSION

Regarding the characteristics of the interviewees, there was a predominance of males, different from the data found in a previous study (11). This difference is already being described by other authors, who state that the percentage difference between female and male individuals affected by chronic wounds has been decreasing over the years (1,12). The restrictions caused by chronic wounds in the daily life of men involve impacts on work and social life (12). This is because, in many cases, withdrawal from work and early retirement are necessary, which causes a decrease in family income and social isolation (13), as well as compromises in the ability to walk independently and in the potential for physical activities. Regarding age, the predominance of the elderly is also corroborated by previous research (11,14). The low level of education of individuals must be taken into account by professionals when it comes to the approach used to teach self-care, since the lack of understanding about this care can result in the difficulty or lack of adherence to the indicated treatment (14-15).

Most patients had a Body Mass Index considered normal according to measures established by the Brazilian Association for the Study of Obesity and Metabolic Syndrome (16). Despite this, there was an important percentage of patients who reported regular consumption of alcoholic beverages and tobacco, which negatively impact wound healing (17-18). Diabetes mellitus, arterial hypertension and chronic venous insufficiency interfere in the healing process due to vascular impairment, noting also that diabetes can contribute to the development of infections (7). For this reason, the importance of proper management of the patient's comprehensive therapeutic plan is reiterated, and not just of wound-related interventions. E Regarding the size of the lesions, it is known that in Brazil lesions with areas larger than 21cm² are common (8,19), therefore, nationally, wounds under 50cm² are considered small (20). The importance of assessing the size of the lesions is highlighted, since wounds with large areas require more time to heal, even when subjected to appropriate treatment. In addition, it was also seen that, when correlating the number of clinical signs of infection in the wounds with the variable size of the lesion, there was a statistically significant positive correlation, indicating that the larger the wound area, the more clinical signs of infection are identified.

Despite this, it should be noted that authors of a recent survey conducted in Brazil stated that clinical signs of infection in the wounds cannot be used as predictors of the presence of multi-resistant bacteria in the lesions (19). The predominance of wounds with granulation tissue is a positive point, since it indicates an adequate progress of the tissue repair process, with a view to wound healing (1). On the other hand, the types of exudates found primarily were serous and purulent. It is known that the presence of serous exudate makes up the natural healing process for chronic wounds (1). However, the presence of purulent exudate alone allows diagnosis of infection in the wound, according to the American Infectious Diseases Society of America (5). This finding maintains an important relationship, therefore, with an important prevalence of infection between the wounds evaluated and the products used in the dressings, with emphasis on silver sulfadiazine, since it is part of clinical practice to indicate the use of this dressing to treat or prevent infections in wounds (21).

However, a systematic review extension published by the Cochrane Library in 2010 pointed out that the majority of research dealing with the use of silver in wounds with a view to minimizing infections was small and of poor quality. The authors concluded that there is not enough evidence to support the use of dressings or creams containing silver, since it was seen that it has no effect on the infection (22). Hydrogel, on the other hand, a product also widely used in the evaluated wounds, is a product basically composed of water, providing adequate humidity to the wound bed. They are indicated for dry wounds, or with moderate exudate production and contraindicated for very exudative wounds (23-25). It is known that the small sample size and the sampling technique used were limitations of the study. Therefore, it is suggested that surveys be carried out with a larger number of participants.

Conclusion

The epidemiological and clinical panorama of patients with chronic wounds undergoing outpatient follow-up points to the prevalence of elderly male patients with multiple associated chronic diseases, with inadequate lifestyle habits (such as sedentary lifestyle and regular consumption of tobacco and alcoholic drinks) and inactive ones labor, mainly with venous ulcers. The lesions predominantly presented areas with more than 21 cm², superficial depth, granulation tissue in the bed and macerated edges. It was found that 70.0% of the assessed lesions are clinically infected, with emphasis on the presence of a statistically significant positive correlation with the size of the lesion, that is, it points to the possibility of finding a greater number of clinical signs infection in wounds with a larger area. Careful assessment of patients helps to determine the care plan that should be adopted. That is, it is highlighted that skills related to interventions related to the characteristics of injuries are not enough. However, it is also essential to master knowledge related to the epidemiology of the unit, since the sociodemographic aspects have a great influence on the need of the individual.

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