

**PAPAIN WITH UREA CREAM IN PRESSURE INJURIES: A CASE SERIES STUDY****PAPAÍNA COM CREME DE UREIA EM LESÕES POR PRESSÃO: ESTUDO DE SÉRIE DE CASOS****PAPAIN CON CREMA DE UREA EN LESIONES POR PRESIÓN: ESTUDIO DE SERIE DE CASOS**

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**ABSTRACT**

**Objective:** to evaluate the action of papain associated with 10% urea cream on tissue repair in patients with pressure injuries. **Method:** Case series study of nine selected patients. **Results:** of all participants, the presence of nine lesions was identified, whose characteristics varied between stages 2, 3 and 4. The use of papain improved exudate, reduced the size of the lesions, improved the tissue in the bed, evolving to granulation, reducing necrosis. **Conclusion:** Papain is a promising treatment as a dressing for pressure sores. Contributions to practice: the use of papain associated with urea cream is advantageous due to its effectiveness. **Descriptors:** Pressure injury; Papain; Efficiency; Healing; Nursing.

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## RESUMO

**Objetivo:** avaliar a ação da papaína associada ao creme de ureia 10% no reparo tecidual em pacientes com lesão por pressão. **Método:** Estudo de série de casos de nove pacientes selecionados. **Resultados:** da totalidade de participantes identificou-se a presença de nove lesões, cujas características variaram entre os estágios 2, 3 e 4. O uso da papaína melhorou exsudato, reduziu o tamanho das lesões, melhorou o tecido no leito, evoluindo para granulação, reduzindo a necrose. **Conclusão:** A papaína é um tratamento promissor como cobertura de lesões por pressão. Contribuições para a prática: a utilização da papaína associada ao creme de ureia torna-se vantajosa devido a sua efetividade.

**Descritores:** Lesão por pressão; Papaína; Eficácia; Cicatrização; Enfermagem.

## RESUMEN

**Objetivo:** evaluar la acción de la papaína asociada al crema de urea 10% en el reparo tisular en pacientes con lesión por presión. **Método:** Estudio de serie de casos de nuevos pacientes seleccionados. **Resultados:** la totalidad de los participantes identificó una presencia de nueve lesiones, cuyas características varían entre los estadios 2, 3 y 4. El uso de la papaína mejoró el exudado, redujo el tamaño de las lesiones, mejoró el tejido en el lecho, evolucionando a la granulación, reduciendo la necrosis. **Conclusión:** La papaína es un tratamiento promisorio como cobertura de lesiones por presión. Contribuciones para la práctica: el uso de la papaína asociada al crema de urea resulta ventajoso debido a su efectividad.

**Descriptorios:** Lesión por presión; Papaína; Eficacia; Cicatrización de Heridas; Enfermería.

## INTRODUCTION

Pressure injuries (PIs) are characterized as localized damage to the skin and/or underlying soft tissues, usually over bony prominences or associated with a medical device. The lesion can manifest itself in intact skin or as an open lesion, caused by intense and/or prolonged pressure at the junction with shear.<sup>1</sup>

Pressure injury prevalence rates vary between countries. In Canada, the rates of PIs are between 36.8% and 53.2% in patients admitted to long-term care institutions (LTC), while in the United States (US) it varies from 4% to 14% and in Brazil, the prevalence it reaches 25.6% in individuals admitted to an intensive care unit

(ICU). In the Medical Clinic sectors, there are the highest percentages of individuals with pressure injuries and the highest prevalence.<sup>1</sup>

The increase in hospital stays increases the risk of hospital infections, becoming a serious public health problem. In addition to the risk of infection, patients may develop disabilities due to changes in limb functionality and also physical and emotional suffering.<sup>1-2</sup>

Intrinsic factors (age, nutritional status, tissue perfusion, skin hydration, mobility conditions, level of consciousness and comorbidities) and extrinsic factors (friction, shear, humidity and pressure) are directly linked to the development of LPs.<sup>1</sup>

According to the international classification of LPs published in 2016 by the National Pressure Ulcer Advisory Panel (NPUAP) describes them as: stage 1: complete skin with an area of erythema, which does not turn white, and which may appear different depending on the color of the skin; stage 2: partial thickness skin loss with exposure of the dermis; stage 3: loss of its total thickness in which fat is visible; stage 4: total skin loss and tissue loss with exposure or direct palpation of fascia, muscle, tendon, ligament, cartilage or bone. Unclassifiable, where there is total loss of skin and tissue loss in which the extent cannot be confirmed because it is covered by slough and necrosis. And finally, there is deep tissue injury, where the skin may or may not be intact, with the area showing a dark red, brown or purple color that does not whiten or epidermal separation that shows a lesion with a darkened bed or a blister with bloody exudate.<sup>3</sup>

Numerous coverings and products are used to make dressings, including papain, which comes from the latex of the green papaya tree, a tropical fruit normally found in Brazil. It consists of a mixture of proteolytic enzymes and peroxidases, its enzymatic action causes selective debridement of the devitalized tissue. It is also used in wounds with different etiologies, in all phases of healing and in patients of different ages due to its regenerative, anti-

inflammatory properties and modulation of tissue repair.<sup>4-6</sup>

The objective of this study was to evaluate the action of papain associated with 10% urea cream on tissue repair in patients with pressure injuries.

## METHODS

This is a case series, documentary study, using retrospective records to monitor the evolution of the treatment of patients with pressure injuries. The period from January to December 2019 was used to include patients who were hospitalized in the wards.

The research field was a University Hospital located in the city of Rio de Janeiro, in the medical clinic sectors. It is a quaternary care hospital whose wards are mixed and admits adults in different age groups and with different pathologies.

The sample was consecutive, composed of patients hospitalized from January 2019 to December 2019, meeting the following inclusion criteria: prescription of papain with 10% urea cream by the Dressing Committee, age equal to or greater than 18 years, injuries of category 2, 3, 4, as well as unclassifiable ones, using papain. Patients with allergies to the product under investigation are excluded; latex allergy; psychiatric illnesses; pregnancy and lactation; infection at the site of the lesion, absence of evolution in the recording system

for at least five weeks of follow-up describing the characteristics of the lesions, papain associated with another type of dressing, use of another type of dressing before applying papain.

For data collection, the electronic medical record system of the participating hospital was used, and a survey was carried out of all the patients who had been admitted to the wards included in the study over a 12-month period, equivalent to the full year of 2019, 27 patients were captured and after applying the exclusion criteria, 09 were selected. In the medical records, we identified the participants' sociodemographic and clinical data, as well as information on the evolution of the lesions. The medical records of each patient were analyzed weekly for five consecutive weeks.

The study variables were: outcome variables area reduction or wound healing. Explanatory variables: age, comorbidity, diet, lesion site, edge, staging, odor, exudate, itching, type of tissue, infection, pain, edema, size and the concentration of papain used.

The analysis was carried out using an online spreadsheet on the Google® platform. Ef univariate analysis, using simple descriptive statistics, with the purpose of describing the clinical and sociodemographic characteristics of the patients included in the research through mean, median, standard deviation and

interquartile range according to the normality of the data.

The research met the ethical principles of Resolution No. 466/2012 of the National Health Council, being approved by the Research Ethics Committee of the participating institution, under opinion No. 3,443,800 and Certificate of Presentation for Ethical Appreciation (CAAE) No. 16427419.3. 0000.5259.

## RESULTS

In the 12-month period, nine pressure injuries were identified in patients admitted to the Hospital's clinical units who used papain associated with 10% urea cream as primary coverage. No patient had an allergic reaction after applying the product. The predominance of LPs occurred in male patients (66.6%) and regarding the degree of staging, four LPs were grade 3, four were grade 2 and one was not classifiable due to the presence of necrosis.

Regarding comorbidities, among the nine participants: Diabetes Millitus (11.1%), Blood Arterial Hypertension (11.1%), Chronic venous insufficiency (11.1%) and Chronic Kidney Disease (33.3%).

LP assessments were carried out weekly for five weeks. The location of the lesion, size of the lesion, presence of exudate, pain, odor, edema, type of tissue present in the lesion and percentage of

papain used were analyzed. In the studied population, seven (77.7%) had a PI rate in the sacral region, one (11.1%) in the tibial region and one (11.1%) in the metatarsophalangeal region.

In the first week of follow-up, eight (88.8%) patients had a macerated edge and one (11.1%) had an epithelial edge, maintaining progressive improvement over the weeks. In the fifth and final week of evaluation, only two lesions (22.2%) had macerated edges, the other lesions had intact edges.

Assessing granulation tissue, in the first week, three (33.3%) presented 1% to 25%, two (22.2%) LPs presented 25% to 50% and two (22.2%) presented 76% to 100% granulation tissue in the lesion bed.

In the third week, eight lesions had 76% to 100% of granulation tissue and five (55.5%) lesions had granulation tissue in 25% to 50% of the total lesion, demonstrating an increase in the amount of granulation tissue.

Granulation tissue increased in most lesions, and in the last week it was observed that granulation tissue was present in nine (100%) lesions, in the following percentages five (55.5%) presented from 1% to 25% of the lesions. total injury, in four (44.4%) from 25% to 50% of the total injury.

Regarding epithelialized tissue, one (11.1%) lesion had 1% to 25% of this tissue in the wound bed, and one lesion had 76% to

100% of epithelialized tissue. Seven lesions (77.7%) did not present this tissue. In the following week, the epithelialization tissue continued at the same percentage as the previous week. From the third week onwards, epithelialization tissue appeared in six lesions (66.6%), with a percentage of 1% to 25%.

Necrotic tissue, in the first week of evaluation, was present in three lesions (33.3%) with a percentage of 1% to 25%, 25% to 50% and 51% to 75%. The remaining lesions (66.6%) did not present any amount of necrotic tissue. In the second week, the three lesions (33.3%) showed 1% to 25% necrosis. With evolutionary improvement, the lesions did not present necrotic tissue in the last week.

Initially, six lesions had slough, three (33.3%) had 76% to 100% and three (33.3%) had 25% to 50%. In the second week, four (44.4%) had 25% to 50% and two (22.2%) had 76% to 100% slough. In the third, one lesion (11.1%) had 1% to 25% and three (33.3%) had 25% to 50%. In the last week, six lesions showed slough tissue ranging from 1% to 25%.

Assessing the exudate, three lesions (33.3%) had no exudate, four lesions (44.4%) had a small amount and two lesions (22.2%) had a moderate amount. Regarding the appearance of the exudate, five lesions (55.5%) had serous exudate, two (22.2%) had serosanguineous exudate and one

(11.1%) had purulent exudate. In the third and fourth week, the exudate began to appear only serous in six lesions (66.6%) and serosanguineous in three lesions (33.3%). In the last week the exudate was absent in all lesions.

The patients had lesions of varying diameters, the smallest measuring 2 cm and the largest measuring 10 cm in diameter. All injuries showed progressive improvement over the weeks.

**Figure 1-** Size of the lesions during the five weeks of follow-up. Rio de Janeiro, RJ, Brazil, 2021

Patient	1st week	2nd week	3rd week	4th week	5th week
1	2.0 x 3.0	2.0 x 3.0	1.0 x 2.5	1.0 x 1.0	1.0 x 1.0
2	4.5 x 3.0	5.0 x 3.5	7.0 x 4.0	5.0 x 5.0	4.0 x 3.0
3	2.0 x 2.0	1.0 x 1.5	1.0 x 0.5	1.0 x 0.5	1.0 x 1.0
4	5.0 x 6.0	5.0 x 6.0	3.0 x 5.0	3.0 x 3.0	2.0 x 2.0
5	4.0 x 3.5	4.0 x 3.5	3.0 x 2.5	1.0 x 1.0	1.0 x 1.0
6	2.0 x 2.0	2.0 x 2.0	1.5 x 1.0	1.0 x 1.0	1.0 x 1.0
7	10.0 x 5.0	10.0 x 5.0	10.0 x 5.0	7.0 x 5.0	7.0 x 5.0
8	7.0 x 8.0	7.0 x 7.5	6.0 x 7.0	6.0 x 6.0	5.0 x 5.5
9	2.0 x 2.0	2.0 x 2.0	2.0 x 1.5	1.0 x 1.0	1.0 x 0.5

In the following evaluations, the care plan underwent changes; in one (11.1%) lesion, 4% papain was used. Regarding the use of papain, five lesions were using 30% papain and the other four lesions were using papain between 2%, 6% and 15%. In the following weeks, five lesions were being treated with 10% papain and the others with percentages of 2% and 6%.

None of the participants presented with their injuries: pain, heat, edema, itching, odor and friable tissue.

## DISCUSSION

Sociodemographic characteristics and the variables addressed can influence the development of PI and, sometimes, must be considered as risk factors. The prevalence of PI is found in elderly people with an average age of 67 years admitted to Brazilian hospitals and advanced age predisposes the skin to a greater risk of injuries.<sup>1,8</sup>

Age was the most frequently reported predictor in studies. However, the average age of patients in this study ranged from 22 to 85 years old, with the majority representing young adults with an average of

43 years old and only two participants were over 60 years old, respectively 75 and 85 years old.

As for underlying diseases, 11.1% of volunteers had Systemic Arterial Hypertension (SAH), and 11.1% Chronic Venous Insufficiency (CVI); 11.1% had Diabetes Mellitus, 33.3% had Chronic Kidney Disease and 44.4% showed that they had no comorbidities. Injuries associated with comorbidities such as Diabetes Mellitus, Hypertension, obesity, neoplasia, vascular diseases, among others, end up favoring the development of wounds that are difficult to heal.<sup>7,9</sup>

The majority of patients in this study were not smokers and/or did not routinely use alcohol. This is a positive factor, as smoking is considered a risk factor for venous ulcers and has an unfavorable impact on the tissue healing process, as it interferes with tissue oxygenation.<sup>4,10</sup>

The characteristics of the edges of the lesions define the tendency of the lesion to heal. In this study, the edges of the lesions became epithelialized, but during the evaluation some showed maceration. At the beginning of follow-up, macerated edges were present in eight (88.8%) lesions and at the end of the five weeks, they were present in only two lesions. The edges with epithelialized tissue tend to be thinner, demonstrating that the healing process is

progressing. Maceration can be caused by prolonged exposure of the skin to fluids.<sup>4</sup>

It is known that debridement with proteolytic enzymes has been proposed to obtain a rapid, non-traumatic removal of unwanted protein material in lesions, presenting the advantage of not causing any harm to the patient.<sup>6</sup>

The use of papain as a debridement, anti-inflammatory and bactericide does not damage tissues, thus promoting rapid healing of the injury. During the analysis of this work, after the phase of debridement of the lesion with papain, a progressive decrease in secretion and growth of granulation tissue was observed. It is observed (Figure 1) that the lesions regressed in size and the appearance of granulation tissue increased, starting at 70% and decreasing over the weeks, reaching 100% of the lesions at the end of the 5th week. These results corroborate previous studies that address the effectiveness of papain.<sup>4,11</sup>

All lesions showed regression in the area, decreasing in size, improving the type of tissue, border, type and amount of exudate.

## LIMITATIONS OF THE STUDY

As it was a case series study, it was not possible to make causal inferences. Furthermore, an internet/intranet network system from the participating hospital was

used, meaning that some of the medical records did not show us the complete evolution of all injuries. Consequently, it was necessary to exclude several possible patients to monitor the action of papain. And because of that, we only have nine injuries.

### CONTRIBUTIONS TO PRACTICE

As this is a serious and worldwide problem, knowing the action of dressings on injuries becomes essential for effective clinical practice.

### CONCLUSION

Taking into consideration the purpose of this research, it was observed that papain achieved the objective of debriding tissue with necrosis, improving the quantity and characteristics of the exudate, thus promoting the appearance of granulation tissue and then epithelialization tissue, causing the wounds to heal. Papain is a therapeutic resource in the promising treatment of skin lesions, being a technology recommended for use in grade 2, 3 and 4 lesions, as long as the patient is not allergic to the product.

Its action is positive, as the study demonstrated that the lesions decreased in size, even if the patients were not followed up until the lesions had completely healed. Papain eliminated all exudate and removed necrotic tissue, without causing harm to the patient, such as pain and burning.

Finally, the study highlights the importance of using papain in hospitalization units of the Unified Health System in the treatment of pressure injuries, highlighting the possibility of better practices in the use of this technology that can be acquired at low costs, relieving the System and contributing for the replication of a practice that, despite not being new, could be used more in health care settings.

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