CLINICAL CASE REPORT ARTICLE

CLINICAL STUDY OF Curcuma longa L. FOR HEALING PRESSURE ULCERS

ESTUDO CLÍNICO DA Curcuma longa L. PARA CICATRIZAÇÃO DE ÚLCERAS POR PRESSÃO

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ABSTRACT

Objective: to evaluate the in vivo effectiveness of a Curcuma longa L. gel as topical therapy for pressure ulcers. Method: this is a prospective study with 6 patients with spinal cord injury who had pressure ulcers in the sacral, trochanteric, and ischial regions, undergoing treatment with a 3% Curcuma longa L. gel, with nonionic carbopol, for 5 weeks. The study was approved by the Research Ethics Committee of Faculdade de Medicina de São José do Rio Preto (FAMERP), under the Protocol 3.579/2009. Results: it was found out an average decrease of 45.2% in sacral lesions. Those in the trochanteric region showed an average decrease of 48.72%. In turn, the ischial ones showed no decrease and, on average, they had a 2.35% increase in total area. Conclusion: there was a higher effectiveness in the treatment for lesions located at the sacral and trochanteric regions; the ischial ones showed no decrease in their dimensions, on the contrary, there was an increase in width and length.

Descriptors: Herbal Medicine; Pressure Ulcer; Wound Healing; Curcuma.

RESUMEN

Objetivo: evaluar in vivo la eficacia de un gel de Curcuma longa L. como terapia tópica para úlceras por presión. Método: se trata de un estudio prospectivo con 6 pacientes con lesiones raquímedulares que presentaban úlceras por presión en las regiones sacrales, trocantericas e isquiaticas, sometidos al tratamiento con una preparación de Curcuma longa L. a 3% de gel de carbopol no iónico, durante 5 semanas. El estudio fue aprobado por el Comité de Ética en Investigación de la Facultad de Medicina de São José do Rio Preto (FAMERP), sob el Protocolo n. 3.579/2009. Resultados: se constató una reducción media de 45.2% de las lesiones sacrales. Aquellas en la región trocanterica presentaron una reducción media de 48.72%. Já as isquiáticas no apresentaram redução e, em média, aumentaram 2,35% na área total. Conclusión: houve maior eficácia del tratamiento para lesões localizadas nas regiões sacra e trocantérica; as isquiáticas não apresentaram redução em suas dimensões, ao contrário, houve aumento em largura e comprimento.

Descritores: Medicamento Fitoterápico; Úlcera por Presión; Cicatrización de Ferida; Curcuma.

RESUMEN

Objetivo: evaluar la eficacia in vivo de un gel de Curcuma longa L. como tratamiento tópico para las úlceras por presión. Método: esta es una investigación prospectiva con 6 pacientes con lesión de la médula espinal que tenían úlceras por presión en la región sacral, trocantérica e isquiatíca, sometidos al tratamiento con una preparación de Curcuma longa L. a 3% en gel, de carbopol no iónico, durante 5 semanas. El estudio fue aprobado por el Comité de Ética en Investigación de la Facultad de Medicina de São José do Rio Preto (FAMERP), bajo el Protocolo 3.579/2009. Resultados: se constató una reducción media del 45.2% de las lesiones sacrales. Aquellas en la región trocantérica presentaron una reducción media del 48.72%. En cuanto a las isquiáticas, estas no presentaron una reducción y, en promedio, aumentaron el 2.35% en su superficie total. Conclusión: hubo un tratamiento más eficaz para las lesiones localizadas en las regiones sacral y trocantérica; las lesiones isquiáticas no mostraron reducción en sus dimensiones, sin embargo, hubo un aumento en su anchura y longitud.

Descritores: Fitofármaco; Úlcera por Presión; Cicatrización de Herida; Curcuma.

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INTRODUCTION

Herbal medicines are regarded as alternative or complementary therapies defined as techniques which aim to assist the individual’s health, in terms of prevention, treatment, or cure, taking into account man as a whole instead of a collection of isolated parts.1 However, their use in the topic care for wounds has raised discussion and controversy.

In nursing, the use of herbal medicines takes place at two moments: in the therapeutic care procedures and in the daily practice, however, their effects are still unknown by most professionals2, and, thus, it shows to be essential developing researches that ground their use and present a positive impact on the assistance provided to patients with wounds.3

Technological advances lead to an increasing use of medicinal substances derived from plants, bringing new opportunities for curing and improving quality of life. Knowledge on the importance of environmental resources in disease prevention, within a holistic view, has already been proposed by Hippocrates, by saying that health and disease depended on the perfect integration between mind/body/environment2 and Einstein, in turn, proposed that many energy systems interact with each other and with the environment, forming a harmonious whole.1

In Brazil, phytotherapy faces difficulties due to extract fractionation, shortage of economic resources, and lack of research encouragement. It is believed that there are national plants equivalent to the imported ones, as a result of the immense biological diversity of our country, however, they are still little used. Their advantages are related to the biological diversity of Brazil, low cost, high effectiveness with low toxicity, and limited side effects.4

Curcuma, belonging to the Zingiberaceae family, Zingiberoidae suborder, is scientifically known under the name of the species Curcuma longa L., found in Brazilian Portuguese with the spelling “cúrcuma” or “curcuma”. It is popularly called “açafroeira”, “açafrão-da-terra”, “açafrão-da-india”, “batatinha amarela”, “gengibre dourado”, and “mangaratiba”. It is herbaceous, perennial, from Southeast Asia.4 In Brazil, it is grown or can be found as a sub-spontaneous species in many states and it reaches, on average, 120 to 150 centimeters tall under favorable climate and soil conditions. The leaves are large, oblong-lanceolate, and oblique-nerved, emanating a pleasant scent when crushed. The primary or central rhizome is pear-shaped, round or ovoid, with secondary side branches, long, also tuberized.4 It has great therapeutic potential for treating degenerative osteoarticular diseases and rheumatic diseases, since it suppresses the catabolite signaling pathway mediated by IL-1/TNF-a in chondrocytes.3

Regarding the essential oil, other benefits were reported: anti-inflammatory activity; antioxidant; antispasmodic; antiarthritic (the usual presence of steroids, with an effect, similar to hydrocortisone); inhibition of the enzymes trypsin and hyaluronidase; anthelmintic and antiprotozoal activity (E. histolytica); antiallergic (bronchitis, rhinitis, asthma, eczema, and urticaria); antibacterial (Staphylococcus aureus); and antifungal (Fusarium udum).4

Studies with positive outcomes were carried out with copaiba oil (Copaifera langsdorffii), sweet potato fibers (Ipomoea batatas), and curumin (Curcuma longa L.).7 In neoplastic hepatic cell cultures in rats, it was observed that curcuma and other curcuminoids exert significant cytotoxic effects on these cells.5 Curcuminoids (curcumin, demethoxycurcumin, and bidenthoxycurcumin) exhibit yellowish color and the essential oil can vary from pale yellow to orange.7

From the perspective of using Curcuma longa L. in topical care for wounds, chemical compounds stand out, such as fatty acids, sugars, starch, carvone and, particularly, curcumin and its action related to biological effects, such as anti-inflammatory, antibiotic, antioxidante, which are crucial features for the topical treatment of wounds.1 Given the Brazilian wealth of flora and climatic diversity, the importance of environmental resources in the prevention and cure of diseases and the use of Curcuma longa L. as alternative or complementary therapy for wound healing, this research aimed to evaluate the in vivo effectiveness of a Curcuma longa L. gel as topical therapy for pressure ulcers.

METHOD

This is a prospective research, with a quantitative approach to check the effectiveness of Curcuma longa L. gel as a topical therapy for pressure ulcers. A prospective study is defined as a population group prospectively followed up in a study, consisting in a clear and objective assertion.9 The work was done in the outpatient wound
dressing unit of Hospital de Base, in the town of São José do Rio Preto, São Paulo, Brazil.

Initially, a pilot study was conducted with a patient with a pressure ulcer in the sacral region, as a result of a gunshot wound, which caused spinal cord injury level T10, leading him to paraplegia and paresthesia. The results found were favorable with regard to the literature findings on wound healing, since the ulcer decreased more than 2 cm per week, due to the phytotherapeutic effects of Curcuma longa L.

The inclusion criteria set were: 1 – the subject should have at least one pressure ulcer; 2 – wounds which had a necrotic area should undergo the debridement process; 3 – laboratory tests should demonstrate that the wounds were not infected; 4 – the patient, or legal representative, should agree to participate; 5 – the age group of these subjects should be above 18 years, their BMI should be below 30, and there should be spinal cord injury.

With the guidance of a pharmacist specialized in compounding pharmacy, through the glycolic extract of Curcuma longa L. at 3%, using the carbopol polymer, a nonionic gel was prepared to be applied on pressure ulcers. Regarding the technique for applying the gel, we procedure was: the wounds were cleansed with sodium chloride solution at 0.9% under saline jet, then a 1 cm layer of gel was applied, and the occlusion was made with occlusive bandage.

Local factors, such as wound size, secretion type, fistulas, tunnels, and stores were recorded. There was an initial measurement of the wounds every 7 days in terms of length, width, and depth, calculated in centimeters. The dressings were made twice a day within a period of 5 weeks, by professionals involved in the research; in the end of the 5th week the final measurement took place. The healing process evolution was clinically monitored when the dressings were made and photographed every 7 days.

For data collection, we applied an instrument, used to assess the healing process, named PUSH (pressure ulcer scale for healing) tool. The PUSH tool considers 3 parameters for this assessment: wound area (greatest length versus width); appearance of the wound bed (predominant tissue in the region); and the amount of exudate present in the wound bed.10

The wounds were weekly measured with regard to length, width, and depth. Data were statistically analyzed, in order to characterize the sample of patients approached and check the progress of wound healing assessed, using percentage and descriptive statistics. The data are displayed in tables, to facilitate the comparison of evidence found.

The project was approved by the Research Ethics Committee of Faculdade de Medicina de São José do Rio Preto (FAMERP), under the Protocol 3,579/2009. The selected patients were aware of the study objectives and they signed a free and informed consent term. The continuity of care for the patients who took part in this research was guaranteed even after the end of the study, with the outpatient follow-up, the guidance, and training of caregiver, as well as home visits.

RESULTS

The sample consisted of patients with pressure ulcers located at the sacral, trochanteric, and ischial regions due to paraplegia. For sample characterization, we used the General Form for Integumentary Registration, according to the Guide to Physical Therapist Practice11, collecting information on sex, occurrence of injury, age, housing, occupation, medication use, health history, previous treatment, neuromuscular, musculoskeletal, cardiopulmonary, and integumentary condition, besides the lesion characteristics, such as color, odor, presence of secretion, shape, and features of the skin around.

A total of 6 patients underwent the study and we found out the average age of 25 years, with a standard deviation of 5.76 years. The minimum certified value was 18 years and the maximum was 32 years. Out of these, 5 (83.33%) were male and only 1 (16.67%) were female.

Regarding the location and number of lesions, all patients showed different locations, and 2 patients (33.33%) had lesions only at the sacral region, 1 patient (16.67%) had it at the sacral region and another one at the trochanteric region, 2 (33.33%) had it at the sacral region, 1 at the trochanteric region, and another one in the ischial region, and 1 (16.67%) had it at the ischial and trochanteric region.

As for housing, it was possible to notice that 3 patients (50%) lived in brick houses in the urban area and 3 (50%) lived in rural areas, all of them with complete sanitation. Patients’ occupation was also checked and it was found out that 3 (50%) were students, 1 (16.67%) was a farmer, 1 (16.67%) was freelancer, and 1 (16.67%) was metallurgical. All assessed patients had paraplegia as a limitation and they also reported the use of medicines related to the ulcers. Out of the...
total number of assessed patients, 3 (50%) had anxiety as health history, 1 (16.67%) anxiety and depression, and 2 (33.33%) showed no pathological conditions.

As for the neuromuscular and musculoskeletal system, all patients had paraplegia, they were normotensive for the cardiopulmonary system and had ulcers in the integumentary system. During examination, it was found that all patients had odorless ulcers with irregular shape. Out of this total, 5 (83.33%) had wounds covered by granulation tissue with a strong red color, and 1 (16.67%) showed granulation tissue with a pale red color. Also regarding the tissue characteristics, it was observed that 3 (50%) showed granulation tissue with a red color and 3 (50%) had, besides the granulation tissue mixture, a yellowish devitalized tissue. About the presence of secretion, we found out that 4 (66.67%) had serous and bloody secretion and 2 (33.33%) had serous secretion.

Concerning skin conditions, it was observed that all patients had skin with smooth texture, with no edema, and with a white color. As for the perilesional skin, we found maceration in 3 patients (50%). In addition, an analysis was made with regard to this skin temperature: 36.6°C of average temperature, with standard deviation of 0.89°C, median of 36.8°C, and minimum of 35.2°C and maximum of 37.8°C.

Table 1 shows the percentage of decrease in each dimension collected with regard to the sacral lesions in all patients.

<table>
<thead>
<tr>
<th>Sacral lesions</th>
<th>Length</th>
<th>Width</th>
<th>Area</th>
<th>PUSH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient 1</td>
<td>60</td>
<td>58</td>
<td>83</td>
<td>31</td>
</tr>
<tr>
<td>Patient 2</td>
<td>11</td>
<td>16</td>
<td>23</td>
<td>14.2</td>
</tr>
<tr>
<td>Patient 3</td>
<td>31.2</td>
<td>60</td>
<td>72.5</td>
<td>18.7</td>
</tr>
<tr>
<td>Patient 4</td>
<td>20.5</td>
<td>9.15</td>
<td>27.25</td>
<td>6.2</td>
</tr>
<tr>
<td>Patient 5</td>
<td>20.0</td>
<td>-</td>
<td>20.0</td>
<td>16.6</td>
</tr>
<tr>
<td>Average</td>
<td>28.46</td>
<td>28.80</td>
<td>45.20</td>
<td>17.38</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>19.01</td>
<td>28.32</td>
<td>30.20</td>
<td>9.06</td>
</tr>
</tbody>
</table>

Patient 1 showed only an ulcer in the sacral region. It was observed that during the days of analysis, all parameters collected decreased. The length of the lesion decreased 60%, the width 58.3%, and the area 83.3. The PUSH tool score had a significant decrease of 31%.

Patient 2, with 2 ulcers, including in the sacral region, showed a slighted decrease in the wound dimensions, with a proven decrease of 11.1% in length, 16.6% in width, and 23% in area. The PUSH tool decreased 14.2%.

Patient 3 had 3 ulcers, and the sacral showed a decrease of 31.2% in length and a decrease in width and area of 60.0% and 72.5%, respectively. The PUSH tool score also had a slight decrease, of 18.7%.

Patient 4 had 4 lesions, he showed a decreased lesion in the sacral region in length (20%), width (9.1), and area (27.2%), presenting evolution in the ulcer area in the middle of treatment. The PUSH tool score showed a decrease with subsequent increase and, in the end, it presented a slight reduction of 6.2%.

<table>
<thead>
<tr>
<th>Lesions</th>
<th>Length</th>
<th>Width</th>
<th>Area</th>
<th>PUSH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient 2</td>
<td>25.0</td>
<td>50.0</td>
<td>62.5</td>
<td>30.7</td>
</tr>
<tr>
<td>Patient 3</td>
<td>50.0</td>
<td>85.7</td>
<td>61.1</td>
<td>37.5</td>
</tr>
<tr>
<td>Patient 4</td>
<td>42.8</td>
<td>-66.6</td>
<td>4.7</td>
<td>-7.1</td>
</tr>
<tr>
<td>Patient 6</td>
<td>33.3</td>
<td>50.0</td>
<td>66.6</td>
<td>36.3</td>
</tr>
<tr>
<td>Average</td>
<td>37.77</td>
<td>29.77</td>
<td>48.72</td>
<td>24.35</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>10.92</td>
<td>66.41</td>
<td>29.44</td>
<td>21.17</td>
</tr>
</tbody>
</table>

In patient 2 there is a decrease in all dimensions of trochanteric ulcer, including the PUSH tool score. Length decreased about 25%, width decreased 50%, area 62.5%, and the PUSH tool score 30.7%. In turn, patient 3 had a decrease of 50% in length, 85.7% in...
width, 61.1% in area, and 37.5% in the PUSH tool score.

In patient 4 the ulcer had increased in size in the last days of treatment assessment. For this wound, we confirmed a decrease of 42.8% in length and a slight decrease of 4.76% in the lesion area. Width increased by 66.6%, promoting an increase of 7.1% in the PUSH tool score. In patient 6, it was possible to demonstrate a reduction of 33.3% in length, 50.0% in width, 66.6% in area, and 36.3% in the PUSH tool score. In this ulcer, there was an increased length and area in the last days of treatment.

Table 3 shows the percentages of decrease of each dimensions collected with regard to the ischial lesions.

Table 3. Percentages of decrease in lesions in the ischial region. São José do Rio Preto, 2012.

<table>
<thead>
<tr>
<th>Lesions</th>
<th>Length</th>
<th>Width</th>
<th>Area</th>
<th>PUSH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient 3</td>
<td>18.1%</td>
<td>39.45</td>
<td>51.25</td>
<td>23.05</td>
</tr>
<tr>
<td>Patient 4 (R)</td>
<td>25.0%</td>
<td>42.8%</td>
<td>58.75</td>
<td>35.75</td>
</tr>
<tr>
<td>Patient 4 (L)</td>
<td>20.0%</td>
<td>52.0%</td>
<td>62.5%</td>
<td>38.5%</td>
</tr>
<tr>
<td>Patient 5</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Patient 6</td>
<td>50.0%</td>
<td>66.6%</td>
<td>75.0%</td>
<td>45.20%</td>
</tr>
<tr>
<td>Average</td>
<td>25.0%</td>
<td>40.0%</td>
<td>50.0%</td>
<td>30.0%</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>2.35</td>
<td>3.75</td>
<td>5.00</td>
<td>2.35</td>
</tr>
</tbody>
</table>

In patient 3, the ischial ulcer showed an increase of 33.3% in length, a decrease of 25% in width, he did not change the area and there was a 18.1% increase in the PUSH tool score. In the case of patient 4, the right ischial showed a decrease of 14.2% in length, an increase of 50% in width, an increase of 71.4% in area, and an increase of 30% in the PUSH tool score. The wound in the left ischial of this patient had a decrease of 10% length showed, he showed no change in width, a decrease of 10% in area and an increase of 30% in the PUSH tool score. Patient 6 had a decrease of 20% in the ulcer length, a decrease of 40% in width, a decrease of 52% in area, and a decrease of 18.7% in the PUSH tool score, and it was the only ischial ulcer which showed a decrease in all parameters.

DISCUSSION

The sample consisted of 6 patients, with a mean age of 25 years, 83.33% were male, 50% were students, 50% lived in brick houses in the urban area, 50% showed signs of anxiety, 50% had granulation tissue, and 50% had maceration in the perilesional area.

Regarding the evolution of ulcers: patient 1 had a decrease of 83.3% in the total area of the sacral ulcer; patient 2 had a decrease of 62.5% in the total area of the trochanteric ulcer; patient 3 had a decrease of 72.5% in the total area the sacral ulcer; patient 4 had a decrease of 42.8% in length of the trochanteric ulcers; patient 5 had a decrease of 90.4% in the total area of the sacral ulcer; patient 6 had a decrease of 66.6% in the total area of the trochanteric ulcers.

As for the general evolution of ulcers, those in the sacral region had a decrease of 45.20% in the total area; those in the trochanteric region had a decrease of 48.72% in the total area. Those in the ischial region had a slight decrease of 3.75% in width. The percentage results show greater decrease in the area of sacral lesions.

Data demonstrate that, despite the increase in width of the ulcer of patient 3, it was possible to find out significant mean decreases in all dimensions analyzed. The increased width of this ulcer may be associated to some external factor, such as inadequate measures aimed at prevention during treatment. Data also show that in the ischial ulcers there was no significant decrease and it was identified an increase in the PUSH tool score.

CONCLUSION

We observed greater effectiveness of treatment for lesions located at the sacral and trochanteric regions, since they showed higher percentages of decrease and the ischial lesions showed no decrease in their dimensions.

REFERENCES


Clinical study of Curcuma longa L. for...


