



Hyperbaric oxygen therapy as an adjuvant treatment for pyoderma gangrenosum *

Oxigenoterapia hiperbárica como tratamento adjuvante do pioderma gangrenoso

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Abstract: Pyoderma Gangrenosum is a rare neutrophilic dermatosis of skin and subcutaneous tissue characterized by a painful and progressive necrotizing process. The management of pyoderma gangrenosum often requires systemic drug therapy, such as corticosteroids, sulfones or immunosuppressants, either alone or in combination. Several reports in the literature document the successful treatment of pyoderma gangrenosum with hyperbaric oxygen therapy. In our case, hyperbaric oxygen therapy associated with corticoids and immunosuppressants promoted healing of large and very painful lesions in an adolescent girl with an excellent outcome, including rapid wound closure and decreased discomfort. **Keywords:** Hyperbaric oxygenation; Pyoderma gangrenosum; Skin diseases, vesiculobullous

Resumo: O pioderma gangrenoso é uma dermatose neutrofílica, rara da pele e do tecido subcutâneo, caracterizada por um processo necrosante progressivo e doloroso. A conduta no Pioderma gangrenoso requer, com frequência, o uso de drogas sistêmicas, tais como: corticoides, sulfonas e imunossupressoras, seja de maneira isolada, seja em combinação. Muitos relatos, na literatura, documentam o tratamento com êxito do Pioderma gangrenoso, com a oxigenoterapia hiperbárica. No nosso caso, uma jovem com lesões extensas e muito dolorosas, o tratamento com oxigenoterapia hiperbárica associado ao corticoide e imunossupressor promoveu cicatrização, com excelente resultado, com fechamento rápido da lesão e diminuição do desconforto.

Palavras-chave: Dermatopatias vesiculobolhosas; Oxigenação hiperbárica; Pioderma gangrenoso

INTRODUCTION

Pyoderma Gangrenosum (PG) is an uncommon ulcerative cutaneous disease of unknown etiology, characterized by a destructive, painful and progressive necrotic process. Its presentation may be isolated or, more frequently, associated with systemic diseases, such as ulcerative colitis, Crohn's disease and rheumatoid arthritis. PG treatment is always difficult and generally consists in the control of preexisting disea-

ses, wound dressing and care, in addition to systemic corticotherapy. Occasionally, despite the high doses of corticosteroids or even immunosuppressants, the lesions continue and become worse, causing considerable discomfort to the patient.

Hyperbaric oxygen therapy (HBOT) is an established and effective treatment for acceleration of the healing process. It is used in skin lesions that resist

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conventional treatment, like venous and arterial ulcers, diabetic foot, burns, pressure ulcers and radiation lesions. Since 1972, some cases regarding the use of HBOT as adjuvant therapy for PG have been reported with promising results, providing the patient with a better quality of life and promoting important pain control, ulcer healing and reduction of the dosage of systemic corticosteroids.

We present a complicated PG case in a 15-year-old adolescent girl. The patient had presented three previous episodes. Bullous and hemorrhagic multiple lesions of variable size erupted on the thigh, arms, left ankle and perineum. Important improvement of the pain and aspect of the lesions was achieved after HBOT was begun.

CASE REPORT

A 15-year-old female patient of mixed race, with a Pyoderma Gangrenosum diagnosis for 2 years, had been using prednisone 40mg/day and cyclosporin 200 mg/day for 8 months and it was not possible to reduce the corticosteroid dose. She returned for an appointment with considerable symptom complex worsening. The exacerbation happened because the Regional Health Department had not furnished her cyclosporin for almost one month. At examination she had a large blister with approximately a 10 cm diameter and serum-blood content on the right ankle and shallow, tortuous ulcers with ill-defined borders and granulous underside in the inguinal and suprapubic region, as well as on the right upper limb, in addition to worsening of previously healed ulcers on the right and left thighs (Figures 1 and 2). All of them were intensely painful. The patient was hospitalized and the service provided involved strong analgesics, ulcer care, administration of hydrocortisone

200mg/day and cyclosporin 200 mg/day. She used the prescribed medication for 3 weeks and the lesions on the right ankle and inguinal region worsened, while there was no improvement of the other ulcers. In view of the severity of the case and rapid progression of the lesions, 10 daily sessions of hyperbaric oxygen therapy at 2.5 ATA during 90 minutes were prescribed, with excellent response.

DISCUSSION

PG, first described in 1930, is a rare ulcerative disease that causes important, painful and progressive skin necrosis.¹ It affects mainly adults, predominantly females between 25 and 50 years of age. Only 4% of cases occur in children and adolescents.²

PG diagnosis is eminently clinical and based on the history and physical examination; biopsy is useful for exclusion of the most common ulcerative conditions, such as infections, vasculitis, collagen diseases, malignancy and ischemic lesions. Although any body part may be affected, preferred locations include the extremities, buttocks, abdomen and face. The mucosae are rarely involved.²

Due to the rarity and complexity of the disease, there is no standardized treatment for PG. The treatment is directed primarily to controlling preexisting diseases. Therefore, the conduct is personalized and based on the evolution of each case.³

The topical treatment should be carefully and conservatively prescribed. A humid environment is the most favorable for lesion healing. The topical or intralesional application of corticosteroids shows presents promising results in some patients, particularly on smaller lesions.³

Systemic therapy is reserved for the most aggressive cases and those with larger lesions.



FIGURE 1: Right ankle lesion before HBOT



FIGURE 2: Perineum lesion before HBOT

Corticosteroid administration helps to interrupt the necrotizing process within 48h from first dose application. Cyclosporin is a second line therapy, frequently used alone or in association with corticosteroids, with increased antimicrobial benefit. Dapsone may be used as alternative to corticosteroids and presents good response both in the treatment and in prophylaxis of relapses. Sulfasalazine is particularly useful in patients with inflammatory bowel disease.³

Hyperbaric oxygen therapy consists in the inhalation of 100 percent oxygen while the patient is at a pressure greater than the atmospheric, in the interior of a hyperbaric chamber. In this environment rich in oxygen there is elevation of its quantity dissolved in the plasma, assisting in the healing process and diminishing the probability of infections. The increase in the quantity of oxygen in the damaged tissues leads to a cascade of proliferative and inflammatory events, necessary for the healing process and closure of sores. Angiogenesis, another process that is oxygen-dependent, is promoted by the hyperbaric environment.⁴

Since 1972, several case reports have been published in the international literature, demonstrating the therapeutic benefit of HBOT in PG, either isolated or as adjuvant with other treatments. Most authors also emphasize the fast ulcer pain relief brought about by the hyperbaric treatment. Another use of HBOT in PG is for surgical preparation of ulcers before skin grafts, as described by Davis et al.⁵ The majority of authors used pressure between 2.4 and 2.8 ATA.⁵⁻¹⁰

The number of sessions to obtain a satisfactory response varied between 11 and 81.⁵⁻¹⁰ This variation is due to individual characteristics of each patient, as it is necessary to correct other preexisting diseases to



FIGURE 3: Right ankle lesion after 7 HBOT sessions



FIGURE 4: Perineum lesion after HBOT



FIGURE 5: Right arm lesion after HBOT

achieve an adequate response. In our case, the patient presented important improvement of pain and ulcer with only 10 sessions (Figures 3, 4 and 5). The improvement was detected soon after the first sessions.

Based on the prior experience of other authors, as well as the success achieved in the treatment of our patient, we recommend the use of hyperbaric oxygen therapy as adjuvant in the treatment of PG. It is worthwhile to emphasize the marked pain relief, within a few days of the beginning of therapy, and the possibility of reduction of the corticosteroid doses employed. □

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