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Treatment of superficial basal cell carcinoma with photodynamic therapy. Observational study in 22 patients with 5-aminolaevulinic acid and methyl aminolaevulinate

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ABSTRACT

Background: There is limited literature on efficacy in 5-aminolaevulinic acid (BF-200 ALA) and methyl-5-aminolaevulinate (MAL) for superficial basal cell carcinoma (sBCC).

Aims: To investigate the efficacy and safety of PDT in sBCC.

Methods: Analytical observational study between January 2014 and January 2017. Follow-up at 12, 24 and 52 weeks. Lesions were treated with one BF-200 ALA-PDT or MAL-PDT cycle of two sessions in one week. A second treatment cycle, with the same photosensitizer precursor, was performed in cases of clinical persistence at 12 weeks.

Results: A total of 22 patients (30 lesions) were enrolled in the study. By sex, 13 men and 9 women. Average age of 72,14 years. In the 12-month follow-up 15/16 lesions were resolved (93,75%) after one or two BF-200 ALA-PDT cycle and 7/14 lesions (50%) after one or two MAL-PDT cycles. In most patients, tolerance to the therapy was good or regular, with no differences between the two groups. No long-term adverse effects were reported.

Limitations: The observational nature and the low number of patients.

Conclusion: PDT is a safe and non-invasive treatment option in sBCC. Our results suggest a better response with BF-200 ALA-PDT over MAL-PDT, at 12 months of follow-up.

1. Background

Basal cell carcinoma (BCC) is the most common non-melanoma skin cancer among Caucasian population [1]. Superficial BCC (sBCC) is, after nodular, the second subtype in frequency. Several therapeutic options have been used for sBCC: surgery, electrocoagulation, cryotherapy, radiotherapy or topical imiquimod. In recent years, PDT has been included as a very good alternative, especially in sBCC unsuitable for surgical treatment [2]. The two photosensitizer precursors used in Europe are methyl-5-aminolaevulinate cream (MAL, Metvix®; Nordic AB,Uppsala, Sweden) and 5-aminolaevulinic acid nanoemulsion gel (BF-200 ALA, Ameluz®; Biofrontera AG, Leverkusen, Germany). There are few studies in the literature on the efficacy of one or the other precursor in sBCC, highlighting the phase III trial by Morton et al. [3], in which BF-200 ALA-PDT was confirmed to be noninferior to MAL-PDT.

2. Aims

2.1. Primary aim

To investigate the efficacy of BF-200 ALA-PDT and MAL-PDT for the treatment of sBCC. For this purpose, we use the lesion complete clearance rate at 12 months (Figs. 1 and 2.

2.2. Secondary aim

To evaluate the safety of the treatment. For this, pain rates were evaluated following the visual analogue scale (VAS, 0–10); and side effects were collected.

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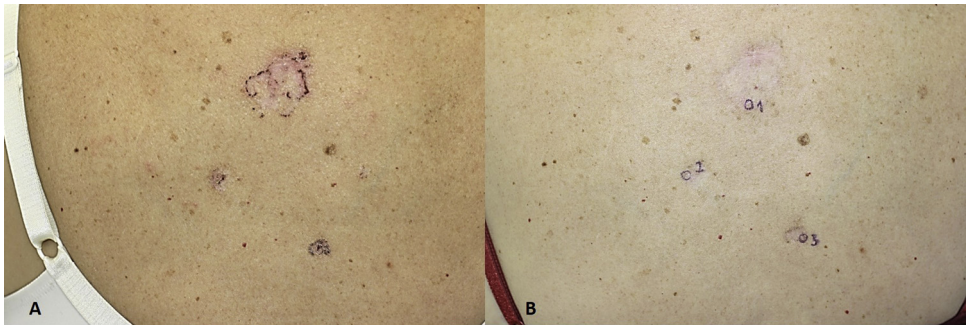

Fig. 1. A: Three erythematous-desquamative plaques, with regular borders and dark pigment spots on the back of a woman. B: Complete clinical resolution after two BF-200 ALA-PDT cycles. Post-treatment biopsies, that confirmed the resolution, marked with blue pen.

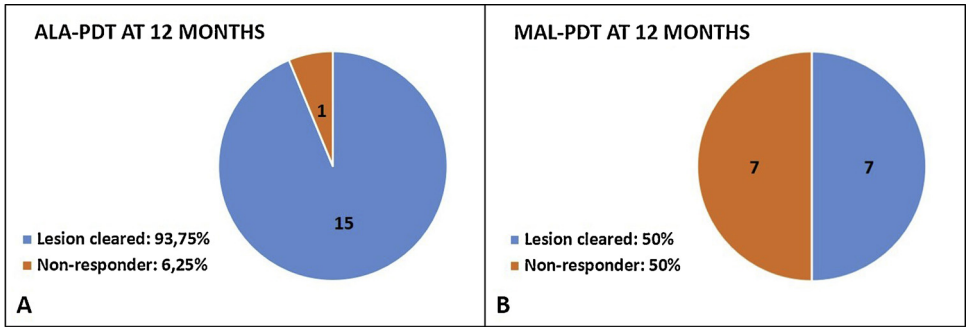

Fig. 2. A: Complete clinical clearance rate at 12 months in BF-200 ALA-PDT group. B: Complete clinical clearance rate at 12 months in MAL-PDT group.

3. Methods

We designed an analytical prospective observational study, in real clinical practice.

3.1. Inclusion criteria

Patients aged 18 years and older, with a clinical and dermoscopic diagnosis of sBCC. In all cases, histological confirmation was made using a 4 mm punch. All patients received information about the study and gave their informed consent prior to treatment.

3.2. Exclusion criteria

Personal history of porphyria or photosensitivity, presence of a genetic skin cancer disorder, allergic reaction to ingredients of the photosensitizer precursor, immunosuppression, pregnancy or lactation and history of previous treatment on sBCC lesions.

3.3. Clinical protocol

Photosensitizer precursors employed were BF-200 ALA and MAL. Patients included in the study were treated alternately with BF-200 ALA and MAL. All lesions were treated with one BF-200 ALA-PDT or MAL-PDT cycle of two sessions in one week. The photosensitizer precursor was applied for 3 h under occlusion. Later, lesions were illuminated with a LED lamp emitting red light (wavelength of 635 nm (Rhodoled®) in case of BF-200 ALA-PDT; and wavelength of 630 nm (Aktilite®) in case of MAL-PDT) until reaching a dose of 37 J/cm [2]. A second treatment cycle, with the same photosensitizer precursor, was performed in cases of clinical persistence at 12 weeks. Follow-up was made at 12, 24 and 52 weeks after last session.

4. Results

Between January 2014 and January 2017, 22 patients (30 lesions) were enrolled in the study. By sex, 13 men and 9 women. Average age of 72,14 years. Location showed 18 trunk lesions, 8 head and neck lesions, 2 upper extremity lesions and 2 lower extremity lesions. A total of 16 lesions were treated with BF-200 ALA-PDT and 14 lesions were treated with MAL-PDT. Our results indicated that 11/16 lesions presented clinical and dermoscopic complete clearance after one BF-200 ALA-PDT cycle. After two BF-200 ALA-PDT cycles 16/16 lesions were resolved. In the 12-month follow-up, 1 recurrence was reported, so a final clearance rate of 93,75% (15/16 lesions) was achieved. 5/14 lesions presented clinical and dermoscopic clearance after one MAL-PDT cycle. After two MAL-PDT cycles 9/14 lesions were resolved. In the 12-month follow-up we obtained 2 recurrences, so the final clearance rate at 12 months was 50% (7/14 lesions) (Figs. 1 and 2).

4.1. Safety

Pain rates were assessed following the visual analogue scale (VAS, 0–10), obtaining identical results in both treatment groups. Good tolerance (VAS, 0–3) was presented in 63,63% from BF-200 ALA-PDT and MAL-PDT groups. Regular tolerance (VAS, 4–7) was presented in 18,18% from BF-200 ALA-PDT and MAL-PDT groups. Bad tolerance (VAS, 8–10) was presented in 18,18% from BF-200 ALA-PDT and MAL-PDT groups. The treatment was not suspended in any patient due to severe pain. Erythema (36,36%), desquamation (45,45%) and superficial wounds (18,18%) were the most frequent side effects from BF-200 ALA-PDT group. Erythema (54,54%), desquamation (45,45%) and superficial wounds (9,09%) were also the most frequent side effects from MAL-PDT group. Long-term complications were not reported in either of the two treatment groups.

5. Conclusion

PTD is a safe and non-invasive treatment option in sBCC. Our results suggest a higher rate of complete clinical clearance with BF-200 ALA-PDT over MAL-PDT, at 12 months of follow-up. In most patients, tolerance to the therapy was good or regular, with no differences between

the two groups. No long-term adverse effects were reported. However, it is an observational study and these data should be confirmed with experimental studies with a larger number of patients.

Funding sources

None.

Conflict of interest

None of the authors has any conflict of interest to be disclosed.

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