

**Application of *Melaleuca alternifolia* essential oils associated with phototherapy in
acneic inflammatory injury**

**Aplicação de óleo essencial de *Melaleuca alterifolia* associado com terapia fotodinâmica
em lesões inflamatórias acneica**

**Uso de aceite esencial puro de melaleuca alternifolia asociado con fototerapia en lesiones
inflamatoria acnéia**

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Abstract

Objective: The use of natural products for diverse affections treatments is something aged, described since the man's cradle, which made use of plants for wounds and natural disorders treatments. That said, the assignment objective is to expose the presentation of an experience report in case of an inflammatory process of bacteria origin due an acne treated with melaleuca essential oil associated with the photo dynamics therapy. **Methods:** For such, the specific spot to be worked on was sanitized with a cleaning solution and after it was hydrated with an invigorating solution. It was used on the spot 20 μ L of melaleuca (*Melaleuca aternifolia*) essential oil and also it was performed a circular massage to spread the product. Over the spot was fell upon a blue intensity light (\pm 550nm) focusing on it. **Results:** After 5 minutes exhibition, edema decreased and pore closure was observed due to an absence of intense fushing, going intense to slight., edema decreased and pore closure. In brief, it is possible to say that the malaleuca essential oil association with application of photo dynamic therapy has the remedial potencial on facing inflammatory and infectious processes caused by acne. **Conclusion:** Lastly, the propagation of cases reports are of crucial importance, since that comparisons with the literature can lend to new therapies alternatives.

Keywords: Dermatology; Natural products; Pharmaceutical chemistry; Acne; Inflammatory; Skin.

Resumo

Objetivo: O uso de produtos naturais para o tratamento de diversas afecções é algo antigo, descrito desde o berço da humanidade, que usava plantas para o tratamento de feridas e doenças naturais. Deste modo, o objetivo do trabalho é mostrar a apresentação de um relato de experiência no caso de um processo inflamatório de origem bacteriana por acne tratado com óleo essencial de melaleuca associado à terapia fotodinâmica. **Métodos:** Para isso, a mancha específica a ser trabalhada foi higienizada com solução de limpeza e a seguir hidratada com solução tonificante. Foi utilizado imediatamente 20 μ L de óleo essencial de melaleuca (*Melaleuca aternifolia*) e realizada massagem circular para espalhar o produto. Luz de intensidade azul (\pm 550 nm) caiu no local, focalizando-o. **Resultados:** Após 5 minutos de

exposição, o edema diminuiu e observou-se fechamento dos poros devido à ausência de desmaios intensos, passando de intenso a leve, diminuição do edema e fechamento dos poros. Em resumo, pode-se dizer que a associação do óleo essencial de malaleuca com a aplicação da terapia fotodinâmica tem o potencial remédio para o enfrentamento dos processos inflamatórios e infecciosos causados pela acne. Conclusão: Por fim, a divulgação de relatos de caso é de fundamental importância, uma vez que a comparação com a literatura pode levar a novas alternativas terapêuticas.

Palavras-chave: Dermatologia; Produtos naturais; Química farmacêutica; Acne; Inflamação; Pele.

Resumen

Objetivo: El uso de productos naturales para tratamientos de diversas afecciones es algo envejecido, descrito desde la cuna del hombre, que utilizaba plantas para tratamientos de heridas y trastornos naturales. Dicho esto, el objetivo de la asignación es exponer la presentación de un relato de experiencia en caso de un proceso inflamatorio de origen bacteriano por acné tratado con aceite esencial de melaleuca asociado a la terapia de fotodinámica. Métodos: Para ello, se higienizó la mancha específica a trabajar con una solución limpiadora y luego se hidrató con una solución tónica. Se utilizó en el acto 20 µL de aceite esencial de melaleuca (*Melaleuca aternifolia*) y también se realizó un masaje circular para esparcir el producto. Sobre la mancha cayó sobre una luz de intensidad azul (\pm 550 nm) enfocándose en ella. Resultados: Después de 5 minutos de exposición, el edema disminuyó y se observó cierre de poros por ausencia de fushing intenso, pasando de intenso a leve, disminución de edema y cierre de poro. En resumen, se puede decir que la asociación del aceite esencial de malaleuca con la aplicación de la terapia fotodinámica tiene el potencial remedio para enfrentar los procesos inflamatorios e infecciosos provocados por el acné. Conclusión: Por último, la propagación de informes de casos es de crucial importancia, ya que las comparaciones con la literatura pueden dar lugar a nuevas alternativas terapéuticas.

Palabras clave: Dermatología; Productos naturales; Química; Farmacéutica; Acne; Inflamatorio; Piel.

1. Introduction

Nowadays we live as esthetics slaves, where the society makes the diffusion from establish patterns in means of social medias, televisions, cinemas and others. Talking about a

historic context, it is possible to notice that the beauty is something that it is in constant modification and has no intention on stopping so soon (Dussel, 2020). The modification by plastics surgeries and esthetics procedures are on the list of objectives of most women, which see themselves outside the current established standart, appelaing to the so-called “miracles” of technology (Barbosa & Brito, 2020).

Among the pathological ones that we seek resolutions, acne is formed by changes in normal homeostasis of the pilosossebaceous follicle, generally originated from a bacterial action inflammatory process by *Propionibacterium acnes* wide-ranging in men and women during puberty and post-puberty periods (Silva et al., 2016). The process of post-puberty acne appearance may present several factors, such as sebaceous hyperproduction, keratose in the follicular canal, increased bacterial settling, dermal inflammatory process, stress, excessive friction and even hereditary factors (Neto et al.,2016).

The use of phytocosmetics for cutanea disorders has been currently growing. These can be applied in order to improve aesthetics features, or even associated with inflammatory processes treatments, infection (mainly bacterial), antioxidative and anti-aging processes among other diverse effects (Costa et al.,2020; Sánchez & Castañeda, 2020; Silva et al., 2020).

Another option that has been widespread is the use of compounds and extracts in epiderme’s lotions and emulsions that has photoprotector activities (which leads to the protection of the specific light region within a luminous spectrum) usually ensuring antioxidative process for skin, avoiding premature aging or sun stains emergence (Aguiar & Novelli, 2020), or even photoreactive activities by photodynamic therapies, which is able to activate photosensitive molecules that can present different biological activities, especially antibacterial (Bezerra, 2020)

In view of the above, the objeptive of this tudy is demonstrating an experience report in case of an inflammatory process due to an acne treated with melaleuca essential oil associated with photodynamic therapy.

2. Development

This task was developed from an experience report of a case attended by the student. To this end, it was performed in accordance with a work developed by Cardoso-Brito et al. (2020) in which is reported a patient specific framework assisted by the authors, with greater impact for the medicine area. This act justifies the process with lower impact on health and

higher quality for the well-being and health of the patient assured. The entire procedure followed ethical conduct in accordance with the Nuremberg Code and the Helsinki Declaration.

The patient mentioned is a woman, 27 years, single, which sought specialized aesthetic service performed by a biomedical for treatment due to stains in the face's cutaneous region.

As indicated treatment, a exfoliation to remove the dead keratinized horny layer, followed by a deep cleaning with cosmetics indicated for that, besides the geotherapy process with green clay for 5 minutes approximately, and after the removal of the mask, an emulsion of hyaluronic acid 2% combined with Vitamin C type THALASPHERAS at 10% was used.

For home use, it was prescribed continuous night use, retinoic acid 0,1% associated to hyaluronic acid 2% and Vitamin C - type THALASPHERAS 10% in a qsp 30g base for skin restructuring purposes. It was informed about the sun rays protection process, with possibility of burns and spots on the face region.

Patient returning within 30 days, presenting local inflammatory lesion with acneic characteristic possibly due to hormonal peak / menstruation period, with presence of intense redness and strong localized edema due to manual friction, with presence of purulent material (exudate) (Figure 1A), carefully removed with the aid of sterile gauze. 20 μ L of melaleuca essential oil (*Melaleuca alternifolia*) was used in the site and associated with exposure of blue light with an intensity of \pm 550nm. After 5 minutes exposure, a decrease of active hyperemia was observed due to the absence of intense redness, going from intense to light, decrease of edema and closing of the pore (Figure 1A),

Figure 1. A - presentation of a flushing picture in the face region due to acneic infectious process. **B** - presentation of skin repair after treatment with melaleuca and photodynamic therapy



Source: Authors.

3. Discussion

Aesthetic treatments against acne contribute to the evolution of a healthy mind and body and the success of these treatments is enhanced when combined with healthy eating habits (Gallitano & Berson, 2017).

The use of products originated from melaleuca is applied to studies of the most diverse pathologies studied new drugs (Assis et al., 1969). The essential oil does not present toxicity, being the topical exposure classified as safe (Bertocchi et al., 2020) besides good tegumentary permeation, which leads to choices as a product for phytocosmetics (Capetti et al., 2020).

The success of the results presented is due to the antibacterial activity present in melaleuca compounds, minimizing the effect on the inflammatory process. This activity is already well described as anti-dermatological (Carmo et al., 2020) and antifungal action (Viana et al., 2020).

Involving the minimization of the inflammatory process of infectious origin, the essential oil of melaleuca has demonstrated effectiveness. Such data corroborates with those found in the literature, which they demonstrate activity on alterations in phyto products against fungus *Fusarium* sp. (Dalio et al., 2020) and inflammations caused by *Staphylococcus aureus*, isolated and in biofilm formation (Lamb et al., 2020).

The combination of extracts, essential oils or isolated compounds associated with photodynamic therapy is already a reality and well disseminated within the aesthetic area (Amaral et al., 2010). Previous reports demonstrate the effectiveness of photodynamic therapy

associated with 5-fluorouracil-2 at 5%, imiquimode at 5%, diclofenac at 3% in gel, retinoids (tretinoin and adapalene) and trichloroacetic acid in basal cell carcinoma, obtaining results of decreased edema and skin erythema (Praia & Figueiredo, 2020).

To this end, the researches within photodynamic therapy are relatively new, and studies are conducted to understand mechanisms and actions when interaction occurs. It's safety is guaranteed and widespread of use in the biomedical area being used by biomedical professionals, beauticians, pharmacists, physiotherapists, physicians, veterinarians, odontologists and others (Aguiar & Novelli, 2020; Bezerra, 2020). Besides the use of therapy with antimicrobial activities, when associated with natural products can present a good antibacterial activity (Bezerra, 2020).

Its action along with melaleuca essential oil demonstrates great effectiveness. Other treatments have been identified in the literature, such as cutaneous leishmaniasis and the use of methylene blue as a photosensitive compound (Cabral et al., 2020), or even, within dentistry in the prevention of caries (Palmeira et al., 2019). Its great use is notorious due to its antimicrobial activity, including in multi-resistant organisms and in the formation of biofilms (Izoton & Israel, 2020).

It is understandable that the association of photodynamic therapy in several waves, has anti-inflammatory potential action and repair activity on tissues of the dermis, and may be something of future studies.

4. Conclusion

To briefly summarise, it can be said that the essential oil of melaleuca has a strong repairing potential in the face of inflammatory and infectious processes caused by acne through the association of application of photodynamic therapy.

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