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Case Report

Magnetic Fields and Vacuum in the Therapy of Facial Seborrheic Dermatitis

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ABSTRACT

Seborrheic dermatitis is a form of chronic skin inflammation that affects the scalp, face and body of a large number of patients, between 1 and 3% of the world's population. It can be associated with neurological disorders and affects children and adults by interfering with the quality of life, causing intense itching and sleep problems, as well as limiting personal relationships.

The therapies proposed are based on topical antifungals, corticosteroids, calcineurin inhibitors and, recently, on monoclonal treatment without being conclusive.

The purpose of this study is to evaluate the efficacy and safety of the synergy between vacuum and electromagnetic fields (VEMFtherapy) in the treatment of seborrheic dermatitis and it is based on the results already documented in the treatment of various inflammatory skin states. The study is based on a 50-year-old woman suffering from a severe form of seborrheic dermatitis from birth.

The results obtained were encouraging, with reduction of redness, skin itching and excessive tearing as complained by the patient, with the recovery of a good sleep quality, all without side effects or downtime.

Certainly, a case history is not sufficient to have a breakthrough in the treatment of seborrheic dermatitis but it is an incentive to extend the present experience to a significant number of patients in order to properly evaluate effectiveness and safety of the therapy adopted.

Keywords: Seborrheic Dermatitis, VEMF Therapy, Biodermogenesi

1. Introduction

Seborrheic dermatitis (SD) is a common and chronic inflammatory dermatologic disorder that usually affects areas of the body with a large density of sebaceous glands, such as the scalp, face and trunk[1]. SD generally occurs in healthy patients, with an incidence ranging from 1 to 3%. In patients with immunodeficiency, the percentage increases dramatically, between 34 and 83%[2]. In some cases, seborrheic dermatitis is linked to neurological diseases[3].

In adolescents and adults, DS presents with mild scaling of the scalp or with diffuse white and yellowish patches in areas rich in sebaceous glands such as the scalp, face and trunk[1,4]. In newborns, DS manifests itself mainly on the scalp in the form of yellowish and scaly patches, commonly called "cradle cap"[4,5].

The cause of DS is not yet clear, although we are starting to learn about some recurring aspects that often involve Malassezia[6].

Malassezia is a normal component of our skin, but in people with DS it has been noted that it invades the stratum corneum, promoting the formation of free fatty acids that are the cause of inflammatory phenomena[6,7]. Redness, itching and flaking are a consequence of this inflammatory state, which tends to become chronic[8].

As in all chronic inflammatory states, also for SD, the therapies are destined to be repeated with continuity, practically for the whole life of the patient. Since this article is dedicated to a case history of facial SD, we will analyze the currently established therapies for this specific type of SD.

The most common therapies for facial SD are topical antifungals, corticosteroids and calcineurin inhibitors.

Among antifungals, which should be applied twice a day, 2% ketoconazole generally attenuates erythema, itching and skin desquamation[9], proving as effective as a topical product based on 1% hydrocortisone[10]. Ciclopirox appears to be better tolerated and more effective than ketoconazole gel[11,12], demonstrating particular efficacy in the maintenance phase[11]. Among antifungals, 2% sertaconazole appears to be the most effective, with better outcomes than a 1% hydrocortisone cream[13].

Based on their efficacy and low impact of side effects, limited to dermatitis and itching, topical antifungal drugs appear to be the preferred therapy for facial SD.

A second therapeutic proposal consists of low or medium concentration topical corticosteroids. They are applied once or twice a day and are usually successful in alleviating the symptoms of SD to a similar extent to antifungals and anti-inflammatories[10,14]. Despite this, they are recommended as second-line therapy, as prolonged use has often been associated with thinning and skin emptying[2,10,14].

The off-label use of topical calcineurin inhibitors remains controversial, which on the one hand seems to be as effective as topical therapy with antifungals and corticosteroids[15,16], on the other hand has received a warning from the US Food and Drug Administration for alleged associations with lymphoma and skin cancer, although the evidence to support such risks is insufficient[17,18]. In any case, their long-term use is not recommended, limiting their application only to the areas affected by SD[19].

At the state of the art there are no known instrumental therapies successfully adopted in SD therapy.

2. Material and Methods

This case history was conducted on a 50-year-old patient, burdened with SD all over the face, often characterized by intense redness and plaques, present since birth. The patient has been treated several times with topical therapies, suspended over the years due to ineffectiveness.

The patient was being treated for several months with Tralokinumab 150 mg, a humanized monoclonal antibody aimed at blocking the production of interleukins 13 (IL-13)[20] which, according to the patient, intensified the redness **(Figure 1)**.

As a result, the patient used a daily cortisone-based ointment to soothe skin irritation. At the moment of the first consultation, the patient presented a considerable redness on the forehead, eye area and oral area; the latters also characterized by significant dryness of the skin.

Figure 1: The first photo was taken at time of the first check-up when the subject was being treated with Tralokinumab and cortisone-based ointment and presented widespread reddening, itching and intense tearing. The periocular area appears weighted down. The second picture was taken after the fifth session, when tearing returned to normal. In the third picture, taken at the end of the treatment program, a clear improvement of the face was appreciated: redness regressed, skin was no longer chapped as before and periocular area lightened, recovering its harmony. Itching attenuated at the fifth session and drastically reduced and endured at the last procedure.

The patient complained a continuous and excessive lacrimation with recurrent past conjunctivitis; this lacrimation was found during the initial visit and the first four sessions.

Patient's major discomfort was due to intense itching, sometimes uncontrollable, which often caused scratching and sometimes inability to sleep.

The most common side effects of Tralokinumab are conjunctivitis and itching[20]. Therefore, we decided to start the therapeutic path with VEMFtherapy during which the patient continued treatment with Tralokinumab 150 mg, confirming the injection of two vials every 14 days while discontinuing the use of topical cortisone therapy.

The patient underwent a cycle of 10 weekly sessions of VEMFtherapy, also known as Biodermogenesi® (medical device Bi-one® LifeTouchTherapy, Expo Italia Srl, Firenze - Italy), between November 2024 and January 2025.

VEMFtherapy acts by reorganizing and normalizing skin functions thanks to the synergistic action of electromagnetic fields, vacuum and electroporation. The electromagnetic field acts by accelerating the exchange between matrix and cells thanks to the pumping action of Na+/K+ through cell membranes, which reorder the positive and negative ion barriers present inside and outside the same membranes. The vacuum, applied on face and neck with a dilation of the cutaneous tissues of one millimeter, allows to reactivate the arterial capillaries, bringing oxygen and nourishment to the matrix and reduce the pressure inside the lymphatic capillaries, actually reactivating the osmotic action of skin detoxification.

At the same time, electroporation enables the vehiculation of active ingredients through the stratum corneum.

The visual results were documented by using an IPHONE 14 PRO MAX (Apple, Cupertino, California, USA). Before starting the treatment cycle, we asked the patient to evaluate the itching on a scale from 0 (no itching) to 10 (maximum itching), identifying exact measuring points such as the center of the forehead, under the right and left eye and above the

center of the upper lip, corresponding to points 2, 13 right and left and 21 of the map by R. Voegeli, et al.[21] Then, we repeated the measurement at the end of the 10 sessions and during the follow-up, four months after the end of the sessions. We also acquired the patient satisfaction level expressed as follows: very dissatisfied (aggravated dermatitis), dissatisfied (no dermatitis variation), moderately satisfied (between 1 and 25% of dermatitis improvement), satisfied (improvement of dermatitis between 26 and 50%), very satisfied (improvement of dermatitis between 51 and 75%) and extremely satisfied (improvement of dermatitis between 76 and 100%) both at the end of the sessions and during the follow-up after four months.

To complete the evaluation of results, we also adopted the DLQI scale, normally used in Dermatology to assess the impact of skin pathologies on the life quality of patients[22] and the Visual Analogue Scale (VAS)[23].

A comparison was made between the values recorded at T0 and T1 and with the values of optimal skin condition. The Wilcoxon Signed-Rank Test was used for the analysis, with significance for $p<0.05$.

The study was conducted in full compliance with the ethical norms and standards of the Declaration of Helsinki and of the MEDDEV 2.7.1 guideline fourth edition. An informed consent statement was preliminarly obtained from the patient **(Table 1)**.

Table 1: The verification of itching on patient's face.

The area of examination	T0 Before therapy	T1 After therapy	Follow-up After 4 months
2 - Central forehead	5	1 (-80%)	1 (-80%)
13 - Right periocular area	7	1 (-85%)	1 (-85%)
13 - Left periocular area	7	1 (-85%)	1 (-85%)
21 - Philtrum	6	1 (-83%)	1 (-83%)

3. Results & Discussion

The results were verified at the end of a cycle of 10 weekly sessions and throughout a follow-up performed four months later. During therapy and for the next four months, the patient discontinued topical medications. The visual analysis showed a widespread reduction of redness all over the face, the skin is much more even and the itching is extremely regressed.

The itching sensation was marked and persistent before the therapies, with greater intensity in the right and left periocular area, accompanied by continuous lacrimation. At the end of the treatment program, both redness and itching were drastically reduced and the improvement remained stable until the follow-up after four months, while the lacrimation vanished completely, leaving room for normal moistening. The marked reduction in itching allowed the patient to recover a good sleep quality. The patient then expressed her extreme satisfaction with the overall improvement, rating them as more than 75% while the VAS rating of the patient and doctors was the same for both with an estimated improvement of 70%, combined with a comfort level of 9 on a scale from 0 to 10. All these data were then confirmed by DLQI that evaluates the psychological impact of the skin disorders and how these can interact and influence the social relationships and the life quality of the patient**. The evaluation of the DLQI test, expressed by the patient before the sessions, pointed out a score of 34 which was reduced to 13 after the end of the therapeutic course, which means a reduction of 21 points or 61,76%, showing how the aesthetic improvement positively affected the quality of the patient's social relationships and self-esteem, improving her overall quality of life with the recovery of regular sleep. All these improvements obtained are well above $p<0.05$ required; without any side effects or downtime, even mild or temporary, were observed at the end of the sessions and throughout the following days **(Figure 2)**.

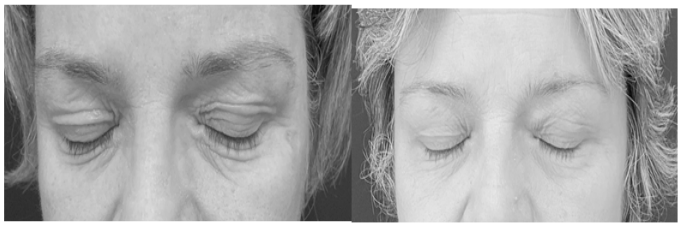

Figure 2: At the end of the treatment cycle, the detail of the periocular area shows a significant decongestion with consequent reduction in swelling of eyelid and malaria bone areas.

There are basically two reasons why we decided to apply VEMFtherapy on a patient with severe seborrheic dermatitis. The first reason is related to the patient's medical history, on whom the existing medicines ceased to have any positive effect, so much so that prior to VEMFtherapy, she had started a monoclonal therapy in order to reduce the activity of the proinflammatory cytokines IL-4 and IL-13, without achieving significant results and even increasing redness, itching and excessive lacrimation. The second reason is related to the literature on VEMFtherapy which has shown, in very complex situations[24], on moderately damaged skin[25] and on substantially healthy skin[26], that it allows a normalization of hydration, sebometry and pH values normally altered by this skin disorder. Our attention was also drawn to the fact that to date no instrumental therapy could be an alternative or synergistic therapeutic path to the proven topical therapy that requires constant applications even several times a day **(Figure 3)**.

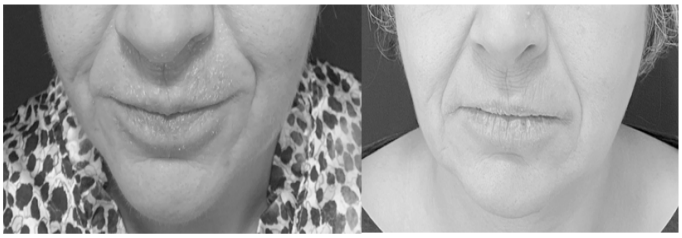

Figure 3: Analyzing the detail of the oral area, a widespread scaling skin with small patches is evident; at the end of the treatment cycle the patches have vanished.

We also believe that some well-known biological effects of the electromagnetic field and vacuum could have a beneficial effect on the disease in question. Considering that SD always shows itself with a significant inflammatory state, the synergy of VEMFtherapy takes particular interest. In fact, we know that the electromagnetic field has shown a clear anti-inflammatory action by stimulating the production of cytokines IL-10[27], a biological reaction also seen with vacuum[28]. The disappearance of the excessive lacrimation, which the patient complained about at T0, would also seem to be a consequence of the anti-inflammatory action of electromagnetic fields and vacuum.

Similarly, we believe that the action of VEMFtherapy on the cutaneous microcirculation, which can reveal itself both with angiogenesis[29] and a functional recovery even in severe and chronic pathological conditions[30], contributed to the results obtained.

Along with the above-described structural improvements, there was also a reduction in apparent skin age, evidently due to the ability of VEMFtherapy to support a significant increase in elastic fibres and type III collagen, which normally exist in large quantities in young skin and then gradually reduced by the age of 16[29]. The aesthetic improvement of the facial skin, particularly noticed by the patient, confirms the experience of Laura, et al.[26]

The whole results obtained, evaluated as part of scientific literature supporting electromagnetic fields and vacuum, allow us to imagine a structural improvement in the treated tissue that seems to be reorganized itself in a functional manner reducing redness and itching of the skin, eliminating excessive lacrimation and allowing the patient to recover sleep.

Therefore, we consider it extremely interesting to carry out an extensive study on an adequate number of patients, preferably multicentric, involving the seborrheic dermatitis patients of different ages, dates and phototypes.

In fact, this case history is limited to a single case and moreover, analyzes the results of two simultaneous therapies, knowing that Tralokinumab during the past few months had not shown a significant benefit on the patient who was complaining of increased redness, itching and lacrimation instead.

We found it plausible to attribute the merits of improvement achieved by the patient as they happened progressively and simultaneously with the delivery of VEMFtherapy.

Similarly, the possibility of developing a synergistic therapeutic protocol that allows the combined use of well-known and safer topical therapies (topical antifungals and corticosteroids) or with other monoclonal therapies, such as the one adopted on the patient we treated together with VEMFtherapy, where the instrumental therapy could help both with its therapeutic potential and in limiting the typical side effects of topical therapies, i.e. dermatitis and itching for the antifungals[9,13] and skin loosening and thinning for the corticosteroids[2,10,14].

4. Conclusion

Being this article a case history, any evaluation of the outcomes must necessarily be subject to further verification on a larger group. That being said, we believe that the improvements achieved in this case, functional (itching, excessive tearing, sleeping disorders), aesthetic (widespread redness and peeling of the skin of the face), in life quality, as well as the total absence of side effects and downtime and patient's high comfort level encourage the development of similar studies on a larger group of subjects with the aim of confirming VEMFTherapy as a new effective and safe therapeutic option for the treatment of SD, both combining it with medications already known at the state of the art and as sole therapy for less severe forms of SD, as alternative to such drugs.

5. Authors Contributions

A.G.F. - execution of first consultation, check-ups and therapies; M.B. – development of therapeutic protocol and writing of the article.

6. Conflicts of Interests

M. Busoni is a member of the Board of Directors of Expo Italia Srl, A.G. Fiorentini declares no conflicts of interest.

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