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Nailfold capillaroscopy as a diagnostic and prognostic method in rosacea [*]

Uso da capilaroscopia ungueal como método diagnóstico e prognóstico de rosácea

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Abstract: BACKGROUND: There is no appropriate and reliable method of evaluating and monitoring severity in rosacea.
OBJECTIVE: To determine the importance of nailfold capillaroscopy as a diagnostic and prognostic method for patients with rosacea.
METHODS: A cross-sectional study where eight patients with rosacea and 8 control subjects were submitted to nailfold capillaroscopy from May to July 2009. We collected clinical data related to gender, age, skin phototype, and rosacea stage according to Plewig and Kligman classification and the classification of the National Rosacea Society. Additionally, we evaluated the progression of the disease and treatment therapies previously used.
RESULTS: The majority of the patients evaluated (6 out of 8 patients) had rosacea subtype I (vascular) or erythematotelangiectatic rosacea. The mean duration of the disorder was 5.96 years, and 87.5% of the patients were under treatment with topical metronidazole. Nailfold cappilaroscopy showed that evidence of devascularization was absent in both groups.
CONCLUSION: Nailfold capillaroscopy presents a nonspecific pattern and does not seem to help in the diagnosis or prognosis of rosacea.
Keywords: Diagnosis; Diagnostic techniques and procedures; Microscopic angioscopy; Rosacea

Resumo: FUNDAMENTOS: Não há um método adequado e fidedigno de avaliação e seguimento da severidade na rosácea.
OBJETIVO: Determinar a importância da capilaroscopia periungueal como método diagnóstico e prognóstico em pacientes portadores de rosácea.
MÉTODOS: Estudo transversal onde foram submetidos ao exame da capilaroscopia periungueal 8 pacientes com rosácea e 8 controles no período entre maio e julho de 2009. Foram coletados dados clínicos relacionados ao sexo, idade, fototipo, classificação da rosácea de acordo com a classificação de Plewig e Kligman e a classificação da National Rosacea Society. Adicionalmente, avaliamos o tempo de evolução da doença e tratamentos previamente utilizados.
RESULTADOS: A grande maioria das pacientes avaliadas (6 das 8 pacientes) apresentavam rosácea grau I (vascular) ou eritêmato-teleangiectásica. A idade média de duração da rosácea foi de 5,96 anos, sendo que 87,5% faziam tratamento com metronidazol tópico. Nenhum paciente tanto do grupo rosácea como controle demonstrou evidência de desvascularização ao exame capilaroscópico.
CONCLUSÃO: A capilaroscopia periungueal apresenta um padrão inespecífico e não parece auxiliar no diagnóstico ou prognóstico da rosácea.
Palavras-chave: Angioscopia microscópica; Diagnóstico; Rosácea; Técnicas de diagnóstico e procedimentos

INTRODUCTION

Rosacea is a common cutaneous disorder in adults, with a wide clinical variability. It affects 10 to 20% of the population between 30 and 60 years old, most commonly women, and occurs more often in individuals with fair-skin phototypes. [2,3,4] The disease primarily involves the microcirculation of the central portion of the face and is characterized by persistent vasodilatation, increased vascular permeability and hyperreactivity. [2]

Currently, there is no more objective method or more refined laboratory test for evaluation and monitoring of the severity of the disease than a clinical evaluation, which is quite subjective. [2,3,4] The main clinical parameters used are the presence of papules or pustules, erythema, telangiectasias, an evaluation by physician and patient, with no standardization in the way of evaluating these variables. [4]

Nailfold capillaroscopy is a noninvasive, risk-free and simple-to-perform method used to evaluate microvascular abnormalities and influence therapeutic methods. [5]

MATERIALS AND METHODS

This is a case-control study aimed at determining the importance of nailfold capillaroscopy as a diagnostic and prognostic method in patients with rosacea being treated at the Dermatology Service of the Clinics Hospital of Curitiba.

We defined as criteria for inclusion in the sample patients with rosacea diagnosed by specialized professional (dermatologist) or through histopathology. Exclusion criteria included rheumatic diseases and Raynaud's phenomenon. The controls were chosen taking into account age and sex matching. We selected 15 patients with rosacea and 15 controls from March to April of the current year, with only eight patients in each group attending the nailfold capillaroscopy examination performed from May to July 2009.

We collected clinical data related to gender, age, skin phototype, and rosacea stage according to Plewig and Kligman classification and the classification of the National Rosacea Society. Additionally, we evaluated evolution time of the disease and treatment options previously used.

Nailfold capillaroscopy (NC) was conducted at the Rheumatology Service of the Clinics Hospital at the Federal University of Parana by a single investigator trained to avoid subjective differences in the interpretation of the examination. All patients were instructed not to remove the cuticle for a minimum of three weeks preceding the examination, since cuticle removal prevents proper evaluation of the nailfold capillary bed. For the examination, we used the Olympus SZ40 stereo microscope coupled to an external light source. The examination was conducted under appropriate conditions of temperature and according to standard protocol. [6,7]

Since it is a skin disease that affects the face, it was impossible for the investigator not to notice the condition during the examination in spite of having not previously learned about the patient's diagnosis. All of the digits in both hands were evaluated during the examination using transparent oily medium (mineral oil) in small quantities on the area to be examined so that the skin would be more translucent and less irregular. The parameters analyzed in the NC test were:

1. Number of loops per mm: for evaluation of the phenomenon of diffuse devascularization; linear capillary density of 7-12/mm is considered normal[7];

2. Number of ectatic and giant capillaries: for evaluation of capillary enlargement; ectasia is the enlargement of the caliber of capillary loops in about 4 times their normal size, with involvement of the three branches: afferent, transitional, and efferent; giant capillaries occur when enlargement is about 10 times the normal caliber[8];

3. Degree of capillary dropout: for evaluation of the phenomenon of focal devascularization. According to Lee et al.[9], capillary dropout is the absence of two or more successive capillaries, and it is possible to quantify the degree of dropout using the following scale:

- No area of dropout: degree zero
- One or two unconnected areas of dropout: degree [1]
- More than two unconnected areas of dropout: degree [2]
- Extensive and confluent areas of dropout: degree [3]

4. Number and distribution (focal or diffuse) of microhemorrhages;

5. Number of bushy, twisted or bizarre capillaries: for characterization of the different morphological patterns of capillaries that may be found;

After the objective analysis, performed quantitatively and semiquantitatively as explained above, we carried out an evaluation of the nailfold capillary bed using the panoramic method, in which the parameters analyzed are described in a concise and more subjective manner. The panoramic method evaluates the changes as a whole, with the advantage of allowing to describe changes that cannot always be registered objectively. Some patterns of panoramic NC[1]:

1. Normal pattern: capillaries in a palisade arrangement, in a regular and homogeneous way;

absence of capillary devascularization

2. SD pattern: presence of focal and diffuse devascularization; enlarged capillaries (capillary ectasia and / or giant capillaries)

3. SLE pattern: long and twisted capillaries; ectatic capillaries, absence of capillary devascularization

4. Nonspecific microangiopathy: presence of microhemorrhages; changes in capillary morphology

5. Traumatic microangiopathy ('cuticulitis' pattern): capillaries with short branches; visibility of the transitional branch only; microhemorrhages with focal distribution

RESULTS

We evaluated the findings on the microvasculature of the nail bed of 8 patients in the rosacea group and 8 patients in the control group.

The mean age in the rosacea group was 48 years old (30-59 years old), while it was 46.62 years old in the control group (28-64 years old). In each group, we evaluated 7 women and 1 man. The vast majority of the patients evaluated (6 out of 8 patients) presented stage I rosacea (vascular), according to Plewig and Kligman classification, or erythematotelangiectatic rosacea, according to the National Rosacea Society.

The mean duration of rosacea was 5.96 years, and 87.5% (7 out of 8 patients) were treated with topical metronidazole.

The interpretation of the results of the nailfold capillaroscopy revealed no patient, whether in the rosacea or in the control group, with evidence of focal or diffuse devascularization. Three patients (37.5%) in the rosacea group and four patients (50%) in the control group showed capillary ectasia in the examination, while two patients (25%) in the rosacea group and three (37.5%) in the control group showed the presence of incipient twisted capillary, which could be related to variations of normality. However, one patient with rosacea presented a giant capillary compared to none in the control group. See table 1.

DISCUSSION

There are several triggering or aggravating factors of the altered vascular response in rosacea, with duration of more than ten minutes. Sunlight, alcohol, exercise, wind, heat and emotional stress are important factors in the development of rosacea[4,5,10]. The relationship between rosacea and *Helicobacter pylori* and *Demodex folliculorum* remains controversial [1,10,11].

For diagnosis, one of the following characteristics must be present: transient or permanent facial erythema, telangiectasias and/or inflammatory lesions (papules, pustules, nodules). Lesions resulting from dermal and sebaceous hyperplasia (phymas), ocular disorders, edema, burning and skin xerosis can also characterize rosacea [3,10,12,13]. According to Crawford and colleagues, the presence of persistent erythema on the central portion of the face for a minimum of 3 months is essential to establish a clinical diagnosis of rosacea [10]

Currently, there are two clinical classifications of rosacea. In Plewig and Kligman classification, rosacea can be described as stage I (vascular), II and III (inflammatory) and variants (phymas, ocular rosacea, granulomatous rosacea, persistent edematous rosacea, rosacea conglobata, and rosacea fulminans)[12]. According to the *National Rosacea Society,* the dermatosis is classified into subtype 1 (erythematotelangiectatic rosacea), 2 (papulopustular rosacea), 3 (phymatous rosacea), 4 (ocular rosacea) and one variant (granulomatous rosacea)[3,4,12,13]. Classification into subtypes is important because of the different kinds of therapeutic management for each case [10].

Despite current therapeutic advances in the control of rosacea, its physiopathology remains partially unknown. Treatment options are empirically directed to the signs and symptoms of the disease, without understanding the mechanism through which the disease settles [4,10].

Capillaroscopy and videocapillaroscopy represent non-invasive techniques that arise as methods for assessing skin microvasculature and the dynamics of microcirculation [6,14,15]. Capillaroscopy of the nailfold capillary bed is widely used for the diagnosis and monitoring of rheumatic diseases (scleroderma, dermatomyositis) and for the distinction of primary and secondary Raynaud's phenomenon[2,6].

Microscopic capillaroscopy was first described in 1663 by Johan Christophorous Kohlhaus. In the 70s and 80s, several studies confirmed the usefulness of the panoramic nailfold capillaroscopy, which was introduced in Brazil in 1987 after an extensive study of normal findings for our population[6]. It presents different caracteristics in elderly patients, diabetic patients and patients with arterial and venous insufficiency [14,15].

TABLE 1: Capillaroscopic pattern of cases and controls

Nailfold capillaroscopy	Cases	Controls (8)
Twisted capillaries	2	3
Bushy capillaries	-	-
Ectatic capillaries	3	4
Giant capillaries	1	-
Dropout	-	-

CONCLUSIONS

This study does not reveal a specific capillaroscopic pattern that can assist in the diagnosis of rosacea by showing capillary morphological changes that constitute variants of normality often present in patients without the dermatosis. More studies with larger samples are needed before nailfold capillaroscopy can be conclusively ruled out as a diagnostic and prognostic method in patients with rosacea. ❑

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