Nailfold capillaroscopic findings in patients with Raynaud's phenomenon: Preliminary report

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ABSTRACT

Back grounds and Aims: Microvascular involvement of nailfold often occurs in systemic rheumatic diseases, especially scleroderma and related conditions. Nailfold capillaroscopy is easily performed non-invasive, simple, repeatable, sensitive, safe and inexpensive method to examine nailfold architecture by microscope.The normal capillaries are thin, symmetrical and have hair-pin appearance. Anomalies include dilated capillary loops, dropouts, tortuosity, avascular area, arborifications, megacapillaries, infracts,thrombsis and haemorrhages. This study aims to see the morphological changes in microcirculation in nailfolds of patients with Raynaud's, which can be helpful in predicting the presence of connective tissue disorder.

Methods: It is an observational study conducted at National Center for Rheumatic Diseases, Kathmandu from 26th March 2014 to 30th March 2015. Nailfolds of 8 fingers of both hands in 105 patients were examined using a hand held microscope.

Results: Of 105 patients, 91 patients (86.6%) had abnormal morphological changes while 14 (13.4%) had no significant changes in microvessels. Normal patients had no underlying connective tissue disease(CTD) but those with abnormal findings had proven underlying CTD which included Lupus 6.5%, Scleroderma 17.5%, Rheumatoid Arthritis 14.2%, Mixed CTD7.6%, Undifferentiated CTD1.0%, Undifferentiated inflammatory arthritis 14.2%, Psorasis 1.0%, Rheumatoid Arthritis with scleroderma overlap 4.3%. No primary diagnosis was found in 32.9% of patients.

Conclusion: Nailfold capillaroscopy allows direct examination of microvascular structure of a patient. Abnormal findings in a patient with Raynaud's phenomenon might help to identify the presence of or future evolution into systemic connective tissue disorder.

BACKGROUND

Raynaud's phenomenon (RP) can occur with or without systemic involvement. RP is the initial presentation in many connective tissue diseases.[1-3]Microvascular changes in nailfold capillaries often occurs in systemic rheumatic diseases like scleroderma(SSc), lupus etc.[4,5]

Nailfold capillaroscopy is easily performed non-invasive, reproducible and inexpensive method to examine nailfold

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architecture.The normal capillaries are thin, symmetrical with hair-pin appearance. Anomalies include dilated capillary loops, dropouts, tortuosity, avascular area, arborifications, megacapillaries, infarcts, thrombosis and haemorrhages [figure 1].[6,7]Distinguishing primary and secondary RP is important in making a treatment plan and prognosis of a patient.

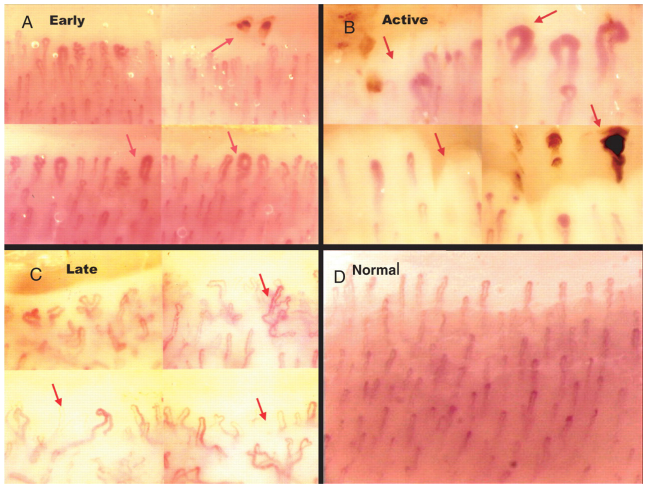

Figure 1:

We aim to examine morphological changes in microcirculation in nailfolds of patients with Raynaud's which would help in predicting the presence of rheumatic disease.

METHODOLOGY

This is a single center cross-sectional observational study conducted at National Center for Rheumatic Diseases (NCRD), Kathmandu from 26th March 2014 to 30th March 2015. Consecutive patients with complaints of Raynaud's phenomenon (intermittent pallor, coldness or cyanosis of digits) were included. Those with diabetes mellitus were excluded.

Nailfolds of 8 fingers were examined using a digital capillaroscope. Patients were rested at a room temperature of 20-22°C for 15–20 minutes. A drop of immersion oil is placed on the cuticle of the fingers.Fingers affected by recent trauma were not analyzed.

RESULTS

A total of 105 patients were included in the study. Any capillary abnormality was seen in 91 patients (86.6%), whereas 14 (13.4%) had no significant changes. Normal patients had no underlying connective tissue disease (CTD). Of those with abnormal findings, 32.9% did not have any other primary diagnosis. Others were diagnosed with various underlying rheumatic disease as illustrated in figure2. Lupus, scleroderma, rheumatoid arthritis and mixed connective tissue disease (MCTD) constituted the main underlying diagnoses.

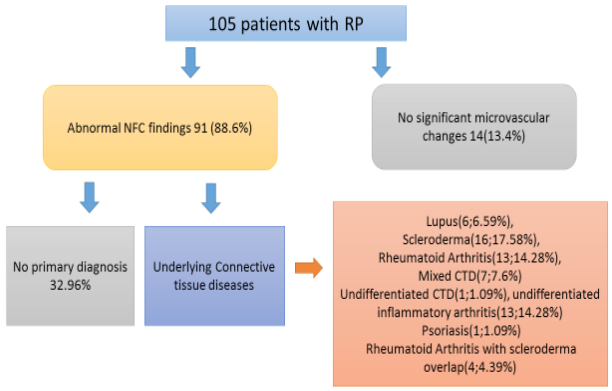

Figure 2:

DISCUSSION

Raynaud's phenomenon is a common symptom occurring in 3-5 % of general population, with a higher prevalence in women than in men.[8]Many people with RP may not have underlying connective tissue disease or any other secondary cause (Primary RP). The diagnostic criteria for primary RP include normal NFC findings.[9,10] Rest of those with RP is likely to have an underlying cause.[8] Connective tissue disorders are associated with and often present with RP. Diseases like lupus, scleroderma, MCTD, dermatomyositis are commonly associated with RP.[5] Patients with such disorders have microvascular structural abnormality that can be detected on capillaroscopic examination (NFC). It is necessary and helpful in an individual patient with RP to identify such underlying disorders as it will have implications in prognosis and further management of these patients.[1]

Recent studies have described two fold role of NFC in rheumatology.[11,12] First, it has a role in differential diagnosis of patients with RP. Second, it may have a role in the prediction of clinical complications in CTDs.In scleroderma, pilot studies have shown predictive associations of nailfold capillary changes with peripheral vascular and lung involvement hinting at a role of capillaroscopy as putative biomarker. [13]

A meta-analysis studying factors predicting transition from primary to secondary RP showed that an abnormal NFC finding had a predictive value of 47% followed by a positive ANA (30%) to predict transition to secondary RP. Our study was not designed to follow patients with primary RP but was designed to identify the presence of underlying CTD in patients with RP.[2]In our study, 58% of those with any RP had underlying connective tissue disease.

There are various other studies since then to show that NFC

has a crucial role in monitoring the transition from primary to secondary RP.[13-16]In scleroderma, NFC findings can actually correlate with the early, active or late stages of the disease.[12] Whereas, in disorders like scleroderma, MCTD, dermatomyositis etc these abnormalities can predict pulmonary involvement.[17] Though not used commonly in practice, NFC has an important role in various diseases of rheumatology and its utility is not only limited to patients with RP.[18]

Not only does it help to predict the presence of connective tissue disorder in patients with RP, it is also useful to reliably rule out pathological RP. Most of these patients are over-investigated and treated due to lack of confidence in diagnosing primary RP. A perfectly normal NFC with addition of a negative ANA test can reliably rule out the presence of any underlying rheumatic disease.[2]

We did not try to correlate any specific NFC abnormality with any particular rheumatic disease because of small number of patients in each specific diagnosis.

CONCLUSION

NFC examination is a simple and non-invasive method to evaluate patients with RP. It has a major role in predicting the presence of or evolution to a secondary underlying connective tissue disease and to decide when to stop investigating a patient with Raynaud's phenomenon.

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