

# THE CORRELATION BETWEEN DIMENSIONS OF PERSONALITY AND RESULTS OF THERAPY IN PATIENTS WITH THE PRIMARY RAYNAUD'S PHENOMENON

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## Summary

The Raynaud's phenomenon is a paroxysmal vasoconstriction of peripheral arterioles in hands, more rarely feet, ears, tongue or mamma. The origin and pathomechanism of the disease is not thoroughly explored, however excessive mental excitation (stress) and cold are considered to be the main causes of the primary Raynaud's phenomenon.

The objective of this research was to investigate whether there exist a correlation between the personality dimensions and the results of the therapy among the patients with the primary Raynaud's phenomenon. The group of 60 patients of Dermatology Clinic of Warsaw Medical University, diagnosed with primary Raynaud's phenomenon, took part in this research.

Patients underwent the pharmacological therapy and the proper therapy consisting of relaxation, sessions of sauna and IR, both lasted 24 weeks. Subjects' personality was evaluated with the use of Revised NEO Personality Inventory (NEO-PI-R).

Investigation covered the correlation research between dimensions of the personality and following features: changes in the capillary circulation, level of anxiety, pain and sweating, efficiency of pharmacological therapy, efficiency of the proper therapy and frequency of the symptom's recurrence.

Results of the conducted research allowed to assume that the interdisciplinary approach to health problems of patients with the primary Raynaud phenomenon is necessary.

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Key words: primary Raynaud phenomenon, personality, therapy results

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## INTRODUCTION

The Raynaud phenomenon consists in paroxysmal vasoconstriction of peripheral arterioles in hands, more rarely feet, ears, tongue or a mamma. The contraction lasts 15 to 45 minutes (21, 22). During the ischemic paroxysm the paleness of the fingers is observed and the patient complains of sensory disorders, also called 'numb' fingers. After the ischaemic paroxysm, redness and finger swelling is visible and the patient experiences strong pulsing pain.

The Raynaud phenomenon most often concerns hands, although cases of circulation disorders in heart, kidneys, lungs, oesophagus, central nervous system and retina were reported, as well as the coexistence of the symptom with angina pectoris and migraine. Raynaud's phenomenon might therefore be considered as a systemic disease (fig. 1) with pathological contractions of the blood vessels in any part of the organism occurring in its course (2, 3, 14, 16, 23).

In Europe the Raynaud's symptom is divided into the primary Raynaud phenomenon also called the Ray-

naud's disease and the secondary, called the Raynaud's syndrome. This terminology is not accepted in the United States, where terms Raynaud's disease and Raynaud's syndrome are used interchangeably (3, 16). Some clinical experts (10, 23, 27) engage the term of "Raynaud's disease" only for cases of patients with ailments lasting for two years without developing underlying disease.

The Raynaud's disease pathomechanism has not been thoroughly explored. Excessive mental excitation (stress) and cold are considered as the main cause of primary Raynaud's syndrome (6, 11).

## THE AIM OF THE RESEARCH

Research aimed to investigate whether there exist a correlation between the personality dimensions and the therapy results in patients with the primary Raynaud's phenomenon.

## MATERIALS AND METHODS

The study covered 60 patients of Warsaw Medical University's Dermatology Department, diagnosed with

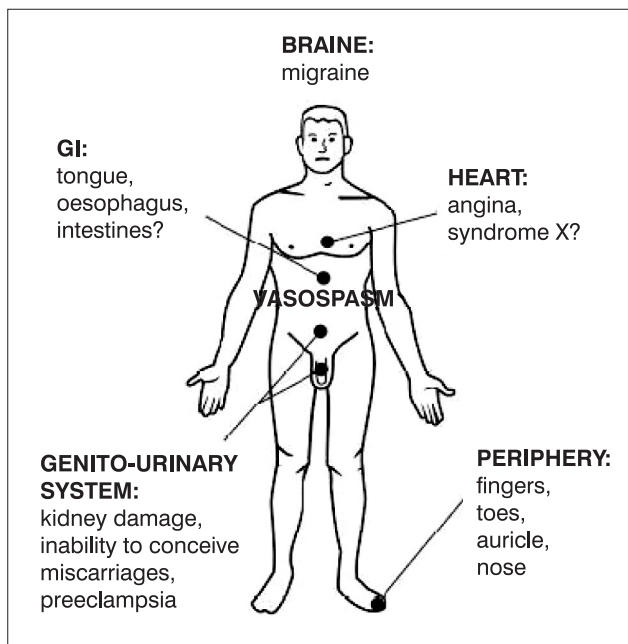


Fig. 1. Generalised predisposition for vascular contractions in patients with the Raynaud phenomenon (16).

primary Raynaud's phenomenon. Qualification for the study consisted in completion of following criteria:

- Age over 18 years.
- History of clinical symptoms characteristic for the primary Raynaud phenomenon lasting at least for two years.
- Characteristic capillaroscopic image (blood congestion, vasospasm, Raynaud's loop).
- Absence of concomitant disease justifying the primary Raynaud's phenomenon.

Participating patients underwent pharmacological therapy as well as proper therapy (infrared sauna or relaxation training). The therapy lasted 24 weeks.

#### PERSONALITY ASSESSMENT

Personality assessment was carried out with Revised NEO Personality Inventory (NEO-PI-R). The inventory consists of 240 items, answered on a five-point scale, ranging from "strongly disagree" to "strongly agree". These statements refer to following five Great Personality Factors: Neuroticism, Extraversion, Openness to experience, Agreeableness, Conscientiousness (24). Personality evaluation has been conducted prior to accession to therapy.

#### CAPILLARY CIRCULATION

Capillaroscopic examination was carried out in order to assess changes in both hands' microcirculation. Capillaroscopy was conducted twice – before and after the therapy. Comparative three degree scale was applied, in which – 1 indicated deterioration, 0 – absence of changes and 1 indicated improvement.

The assessment of pain, sweating, subjective evaluation of pharmacotherapy effectiveness and subjective

evaluation of proper study therapy effectiveness was performed using VAS scale (Visual Analogue Scale). The VAS scale is a horizontal line, 10 cm in length, with labels anchored at each end (the minimum and the maximum), on which the patient is marking the point representing intensity of perceived pain. The result is presented in millimeters (distance between the point and the left end of the stretch) (5). Patients were to judge the "usual" pain.

#### ANXIETY LEVEL MEASUREMENT

STAI questionnaire of Spielberger et al. was used to measure anxiety level. This questionnaire, adapted to Polish conditions by Sosnowski and Wrześniewski (25), allows to measure the state and the trait of anxiety. It consists of two scales including 20 items each. In the state anxiety scale, examined patient refers to his current physical and mental state, having at disposal four categories of replies: "not at all", "somewhat", "moderately so", "very much so". In the trait anxiety scale, answers given by the patient concern the frequency of feelings described in the scale statements and are as follows: "almost never", "sometimes", "often", "almost always". Replies are graded from 1 to 4. In every scale a theoretical scope of results ranges from 20 to 80 points.

#### FREQUENCY OF ISCHAEMIC ATTACKS

Assessment of the Raynaud's symptom recurrence was carried out basing on one week. The study participants answered the following question: 'How often do you experience the Raynaud symptom?'

- once a week
- twice a week
- three times a week
- more frequently (how often?)

#### STATISTICAL ANALYSIS

The study data were analysed with the use of SPSS ver 14 statistical package. The strength of statistical dependence between the variables was explored with the use of Spearman Rho coefficient correlation. The lowest range of significance level was set at  $p \leq 0,05$ .

#### RESULTS

##### Personality diagnose

It was examined whether there occur a correlation of experienced sufferings and the subjective evaluation of the therapy efficacy with the personality of patients with the primary Raynaud phenomenon. Table 1 demonstrates Spearman's coefficients correlation of analyzed variables.

The correlation analysis showed statistically significant correlations between the level of neuroticism and the level of state anxiety, the level of trait anxiety and sweating. It indicates that patients with higher level of neuroticism showed higher level of state anxiety and trait anxiety as well as higher level of sweating after 24 weeks of therapy.

Table 1. The correlation coefficients between the personality dimensions and the therapy effects after 24 weeks.

Variables	Neuroticism	Extraversion	Openness to experience	Agreeableness	Conscientiousness
State anxiety	0,58*	-0,12	-0,03	-0,05	-0,04
Trait anxiety	0,78*	-0,41*	-0,19	0,00	-0,25
Pain in hands	0,13	0,04	-0,03	-0,04	0,11
Sweating	0,39*	-0,33*	-0,11	0,19	-0,16
Frequency of the symptoms per week	0,01	-0,15	-0,15	-0,28*	0,04
Efficacy of drug therapy	-0,07	0,06	-0,05	-0,05	0,20
Efficacy of the proper therapy	-0,16	0,09	0,05	0,33*	0,11
Changes in the capillary circulation	0,19	-0,20	-0,12	0,13	-0,26*

\*p &lt; 0,05

The analysis also revealed the statistically significant correlations between the level of extraversion and the trait anxiety and sweating. That signifies that patients with higher level of extraversion showed lower level of trait anxiety and decreased sweating after 24 weeks of therapy.

Moreover the analysis proved statistically significant correlations between the level of agreeableness and the frequency of the symptoms per week as well as the efficacy of the proper therapy (infrared sauna and relaxation). It indicates that subjects with higher level of agreeableness showed lower frequency of symptoms per week and higher efficacy of the proper therapy (infrared sauna and relaxation) after 24 weeks of treatment.

At last, the analysis demonstrated as well the statistically significant correlation between the level of conscientiousness and changes in the capillary microcirculation. It means that after 24 weeks of treatment, patients with higher level of conscientiousness presented significantly better results of capillaroscopy.

## DISCUSSION

Available literature contains a great number of discrepancies concerning the general classification of Raynaud's symptom. Some researchers (3, 21) tend to doubt the existence of the individual Raynaud's disease claiming that the primary Raynaud's phenomenon would sooner or later reveal to be a secondary symptom. In their opinion it usually takes around two years, although the principal disease may emerge up to twenty years since the occurrence of Raynaud's symptom. There are also other authors(19) that neglect the need of Raynaud's symptom treatment until the appearance of necrotic changes.

Specialists dealing with Raynaud's symptom (1, 6, 9, 26) agree with the anxious background of this affliction, pointing cold as a second factor triggering

ischemic episodes. Etiology issue, as far as we know, is essential for primary Raynaud's phenomenon treatment. Causal treatment proves to be always the most effective one. The only Raynaud's disease treatment method commonly applied in Poland is symptomatic pharmacotherapy. Therefore it is assumed to be unsatisfactory.

The Raynaud phenomenon, and its primary form in particular, are considered as psychosomatic illnesses. The psychosomatic approach assumes that somatic dysfunctions result from overloading organism with stressful situations (7). Few authors (1, 8) consider relaxation and acupuncture as a part of basic Raynaud's symptom treatment, especially in patients, in whom the stress states a main trigger of ischemic attacks. Other researchers (11, 18) emphasize that patients with Raynaud's symptom demonstrate problems with relaxation training. Kulmatycki and Miedzińska (15) proved that desired relaxation state is not a question of chance. Huge role is played by individual susceptibility to relaxation and nervous system strength as well as balance of nervous processes. It indicates that subjects "susceptible to relaxation" are types with strong nervous system model (extroverts with sanguinic, choleric or phlegmatic temperament). Relaxation difficulties may appear in subjects with a weak nervous system type (introverts), less resistant, with low reactivity, colloquially described as melancholic. Susceptibility to relaxation is also covered by Richter-Heinrich (20). The author applied relaxation training in a group of patients with primary arterial hypertension. She noticed that neurotic patients respond better to relaxation training than to biofeedback sessions. Random allocation to experimental groups proposed in our study may understate therapeutic results. Subject with better relaxation abilities might present a better tolerance do sauna. However the experiment's method (4) excludes intentional patient's allocation to therapeutic groups.

Kostrzewa-Jabłonka (12) examined 111 patients treated in the hospital rehabilitation ward. The patients with the high index of neuroticism and the high level of inner tension (Q4 scale of 16 Personality Factor Questionnaire, R.B. Cattell) were qualified to the experimental group. The control group consisted of patients with the low neurotic index and the low level of the inner tension. Kostrzewa-Jabłonka's research revealed, among others, a high correlation between the level of emotional tension and the efficacy of pain treatment. Neurotic patients have not presented effects of physiotherapy process, contrary to emotionally low reactive patients with low anxiety level. In my opinion Kostrzewa-Jabłonka rightly points out the necessity of involvement of psychotherapeutic activities in physiotherapy process. She claims that personality evaluation may improve the chance of an adequate choice of the therapy, therefore increasing the efficacy of treatment. This fact demonstrates the need of a complex therapy of Raynaud's symptom, requiring cooperation of physicians, psychologists and physiotherapists.

The above work is an attempt of an interdisciplinary approach towards the health problems of patients with a primary Raynaud's symptom. Many specialists of physiotherapy, in spite of noticing the effects of psychological problems emerging in the process of rehabilitation, do not take an attempt at psychological support because of awareness of exceeding their competences. On the other hand the idea of "psychology in rehabilitation", despite its early origins in 1948 (Adler worked with the personality of disabled people), remains relatively uncommon (13). I am aware of the fact that cooperation of the leading doctor with physiotherapist and psychologist, in the present reality of "private clinics", seems to be difficult to comply. However the patient's benefit is worth making this effort.

## CONCLUSIONS

Patients with high level of conscientiousness achieved the highest improvement of capillary circulation. In turn, patients with high level of extraversion presented lower level of trait anxiety and lower sweating.

In neurotics cases, the high level of trait anxiety and state anxiety as well as intensive hand sweating sustained in spite of the therapy.

An interdisciplinary approach towards health problems of the patient with the primary Raynaud's symptom is necessary

## References

1. Appiah R et al.: Treatment of primary Raynaud's syndrome with traditional Chinese acupuncture. *J Intern Med* 1997; 241: 119-24.
2. Aron JH et al.: Cerebral oxygen desaturation after cardiopulmonary bypass in a patient with Raynaud's phenomenon detected by near-infrared cerebral oximetry. *Anesth Analg* 2007; 104: 1034-1036.
3. Belch JFF, Ho M: Pharmacotherapy of Raynaud's phenomenon. *Drugs* 1996; 52 (5): 682-695.
4. Brzeziński J: Metodologia badań psychologicznych. PWN 2007.
5. Cepuch G, Wordliczek J, Golec A: Wybrane skale do badania natężenia bólu u młodzieży – ocena ich przydatności. *Polska Medycyna Paliatywna* 2006; 5, 3: 108-113.
6. Cooke JP, Marshall JM: Mechanism of Raynaud's disease. *Vascular Medicine* 2005; 10: 293-307.
7. Czubański K: Choroby psychosomatyczne. *Psychologia Polska* 1984; 18: 389-392.
8. Garcia-Carrasco M et al.: Treatment of Raynaud's phenomenon. *Autoimmun Rev* 2008; 8 (1): 62-8.
9. Grassi W, De Angelis R: Capillaroscopy: questions and answers. *Clinical Rheumatology* 2007; 26: 2009-2016.
10. Jędrasik M et al.: Studium naturalnej historii napadów fenomenu Raynauada, *Polski Przegląd Chirurgiczny* 1992; 63, 2: 43-47.
11. Keefe FJ, Surwit RS, Pilon RN: Biofeedback, autogenic training and progressive relaxation in the treatment of Raynaud's disease; *Journal of Applied Behavior Analysis* 1980; 13: 3-11.
12. Kostrzewa-Jabłonka M: Wpływ wysokiego poziomu napięcia na efekty leczenia w wyniku kompleksowej fizjoterapii chorych z dyskropatią szyjną i łęczykową. *Postępy Rehabilitacji* 1999; t. X, 2: 81-88.
13. Kowalik S: Psychologia rehabilitacji. WAIP 2007.
14. Kozielski J et al.: Zachowanie się parametrów badań czynnościowych układu oddechowego w chorobie Raynauada. *Pol Arch Med Wewn* 1992; 87 (6): 341-344.
15. Kulmatycki L, Miedzińska B: Podatność na relaksację a cechy osobowości. *Postępy Rehabilitacji* 1999; t. XII; 3: 151-159.
16. Lauch CS, Belch JFF: Chirurgia naczyniowa: objawy Raynauada- zaburzenie kurczu naczyniowego. *Chirurgia Współczesna* 1993; 1 (3): 192-197.
17. Michalska-Jakubus M, Chodorowska G, Krasowska D: Kapilaroskopia wału paznokciowego. Mikroskopowa ocena zmian morfologicznych mikrokrążenia w twardzinie układowej. *Postępy Dermatologii i Alergologii* 2010; XXVII, 2: 106-118.
18. Middaugh JS et al.: The Raynaud's Treatment Study: Biofeedback Protocols and Acquisition of Temperature Biofeedback Skills. *Applied Psychophysiology and Biofeedback* 2001; 26, 4.
19. Puszczewicz M: Objaw Raynauada-problem interdyscyplinarny. *Forum Medycyny Rodzinnej* 2008; 2 (2): 121-126.
20. Richter-Heinrich E: Biofeedback, relaksacja i trening opanowania stresu w leczeniu pierwotnego nadciśnienia tętniczego. *Postępy Rehabilitacji* 1988; 2 (2): 135-140.
21. Rychlik-Golema W et al.: Fenomen Raynaud – wciąż aktualny problem kliniczny. *Przegląd Lekarski* 2002; 59,1.
22. Sari-Kouzel H et al.: Foot problems in patients with systemic sclerosis. *Rheumatology* 2001; 40: 410-413.
23. Sicińska J, Rudnicka L: Choroba Raynauada i objaw Raynauada w przebiegu kolagenoz. *Pol Arch Med Wewn* 2002; 108 (4): 1011-1022.
24. Siuta J: Inwentarz Osobowości NEO-PI-R Paula T. Costy Jr. i Roberta R.McCrae 2006; Pracownia Testów Psychologicznych.
25. Sosnowski T, Wrześniewski K: Polska adaptacja inwentarza STAI do badania stanu i cechy lęku. *Przegląd Psychologiczny* 1983; 26: 2: 393-411.
26. Tansey RJ, Wragg EA, Herrick AI: Raynaud's phenomenon and hand function in patients with rheumatoid arthritis. *The Journal of Rheumatology* 2010; 37; 6: 1358-1360.
27. Tuchocka-Piotrowska A, Zimmermann-Górska I, Majewski D: 73-letnia kobieta z objawem Raynauada, twardzeniem skóry, dusznością wysiłkową. *Reumatologia* 2006.

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