

The journal has had 7 points in Ministry of Science and Higher Education parametric evaluation. Part b item 1223 (26/01/2017).  
1223 Journal of Education, Health and Sport eissn 2391-8306 7

© The Authors 2018;  
This article is published with open access at Licensee Open Journal Systems of Kazimierz Wielki University in Bydgoszcz, Poland  
Open Access. This article is distributed under the terms of the Creative Commons Attribution Noncommercial License which permits any noncommercial use, distribution, and reproduction in any medium, provided the original author(s) and source are credited. This is an open access article licensed under the terms of the Creative Commons Attribution Non commercial license Share alike.  
(<http://creativecommons.org/licenses/by-nc-sa/4.0/>) which permits unrestricted, non commercial use, distribution and reproduction in any medium, provided the work is properly cited.

The authors declare that there is no conflict of interests regarding the publication of this paper.

Received: 02.08.2018. Revised: 18.08.2018. Accepted: 31.08.2018.

## **Terry's nails: a review of the literature**

**Sławomir Liberski<sup>1</sup>, Daria Marczak<sup>1\*</sup>**

**<sup>1</sup>Faculty of Medicine, Collegium Medicum in Bydgoszcz, Nicolaus Copernicus  
University, M.  
Curie 9, 85-090 Bydgoszcz, Poland**

*\*Correspondence to: [dariamarczak1@wp.pl](mailto:dariamarczak1@wp.pl) (D. Marczak)*

### **Abstract**

Terry's nails are classified as a type of apparent leukonychia and are usually defined as the proximal, white part of the nail that occupies 80% of the nail, and a brownish to pink distal band that occupies 0.5-3.0 mm of the nail from the side of the free edge of the nail. Lunula may or may not be present. The pathogenesis of Terry's nails has not been fully understood. The dominant hypothesis is that the occurrence of Terry's nails is associated with abnormal nail bed vascularity and the presence of distal teleangiectasias. Differential diagnosis includes half-and-half nails, neapolitan nails, and Muehrcke's nails. Terry's nails are mainly associated with liver cirrhosis, heart failure and adult-onset diabetes mellitus; however, their occurrence may also be associated with advanced age, as well as other systemic diseases.

**Keywords:** Terry's nails; nail abnormalities; apparent leukonychia

## **1. Introduction**

Terry's nails are nonspecific nail abnormalities that were first described in 1954 by Richard Terry in cirrhotic patients [1]. Terry's nails are classified as a type of apparent leukonychia and are usually defined as the proximal, white part of the nail that occupies 80% of the nail; while the brownish to pink distal band occupies 0.5-3.0 mm of the nail from the side of the free edge of the nail. Lunula may or may not be present [2,3]. These nail changes occur most often bilaterally and symmetrically in fingernails, but the predilection for the presence of the thumb and forefinger has been observed [4,5,6]. Two cases of Terry's nails subside after two months of successful liver transplantation due to cirrhosis were noted [7]. In addition to cirrhosis, Terry's nails are mainly found in the course of heart failure and adult-onset diabetes mellitus, as well as in healthy people with advanced age [3,8].

## **2. Pathogenesis of Terry's nails**

The pathogenesis of Terry's nails has not been fully understood. There was no association between the severity of liver cirrhosis, anemia or hypoalbuminemia, and the width of the distal band on the nails [9]. In 1954, Terry hypothesized that these nail abnormalities described in patients with cirrhosis may be the result of abnormal steroid metabolism, and their occurrence may have a common basis with gynecomastia and erythema disorder also described in cirrhotic patients [6]. Similar conclusions from the analysis of biochemical parameters of patients with Terry's nails were obtained by Holzberg and Walker, additionally an abnormal estrogen-androgen ratio was observed [3]. It is assumed that the occurrence of Terry's nails may be associated with abnormal nail bed vascularization [8,10]. Histopathological examination of tissue samples taken by a biopsy performed in patients with Terry's nails showed the presence of distal telangiectasias in the nail bed [3,11]. On the other hand, the disappearance of Terry's nails after two months after liver transplantation due to cirrhosis in two patients reported by Roat and Zucker suggests that abnormal liver function plays an important role in the pathogenesis of Terry's nails; however the exact mechanism remains unexplained [7]. Further research are necessary to fully understand the pathogenesis of Terry's nails.

### **3. Differential diagnosis of Terry's nails**

Differential diagnosis of Terry's nails should include nail anomalies, which may be similar in the physical examination - half-and-half nails (also called Lindsay nails), neapolitan nails and Muehrcke's nails. Half-and-half nails is usually described as a proximal white nail band that occupies 20-80% of the length of the nail, and a distal pink, brown or red band that occupies 40-80% of the length of the nail. These two bands are sharply separated from each other. These changes in nails do not disappear under the pressure of the nail plate and can occur in children, adolescents, as well as in adults and in the elderly [10,12]. These nail abnormalities are the most specific finding for chronic kidney disease (CKD), where the incidence reaches 15-50% (70% in hemodialyzed patients). In addition to CKD, the occurrence of half-and-half nails has been observed in patients receiving chemotherapy and in healthy people, as well as in systemic diseases such as pellagra, liver cirrhosis, Crohn's disease, Behcet's disease and others. Interestingly, no correlation was found between the length of the nail bands and the severity of CKD. It is assumed that changes in the structure of the capillaries in the nail bed as well as the increased release of B-melanocyte-stimulating hormone play an important role in the pathogenesis of half-and-half nails [12]. Physical examination of neapolitan nails is characterized by a lack of lunula, as well as the presence of three discolored, horizontal bands on the nail plate. The proximal band is white, the middle one is pink, and the distal one is opaque [13,14]. A statistically significant association between the occurrence of neapolitan nails and thin skin and osteoporosis has been demonstrated, which suggests a common background of these disorders resulting from abnormalities in the collagen structure [13]. There is a clear tendency towards neapolitan nails in elderly people, with a prevalence rate in the population over 70 years estimated at 19% [15]. In some cases, Muehrcke's nails described as white, transverse bands on the nail plate may resemble Terry's nails in a physical examination. The occurrence of Muehrcke's nails is mainly associated with systemic cancer therapy and hypoalbuminemia [8,16].

### **4. Occurrence of Terry's nails in systemic diseases**

As mentioned, Terry's nails were first described by Terry in 1954 as nail abnormalities observed in 82 of 100 cirrhotic patients. The cause of 91 cases of liver cirrhosis of the described patients was alcohol abuse [6]. Similar changes in nails were also described in 1954 by Terry in 23 patients, including 14 patients with cardiac failure, 4 patients with advanced

pulmonary disease, and five patients with systemic disease - true polycythemia, Hodgkin's lymphoma, hepatic cirrhosis, lymphoid follicular reticulosis, and malnutrition [17]. Holzberg and Walker performed a nail examination in 512 hospitalized patients, of whom Terry's nails were observed in 129 patients. Analysis of the results showed a statistically significant association between the occurrence of Terry's nails and cirrhosis, adult-onset diabetes mellitus, and chronic congestive heart failure. There was also a positive correlation between the age of patients and the incidence of these nail abnormalities [3]. Similar results were obtained by Roat and Zucker in a study of a group of 300 patients, in which 238 patients had liver disease, and cirrhosis was confirmed in 104 patients. The results showed a statistically significant relationship between the occurrence of Terry's nails and liver cirrhosis, as well as other liver diseases, with a marked predilection for alcohol etiology. In addition, a significant correlation between the presence of Terry's nails and congestive heart failure and advanced age has been observed [7]. Park et al. demonstrated an association between the occurrence of cirrhosis, diabetes mellitus, congestive heart failure and the presence of Terry's nails in a group of 444 patients with chronic systemic disease [18]. A study conducted by Jemec et al. showed a statistically significant association between the coexistence of Terry's nails and haematological diseases in non-dermatological patients [19]. The occurrence of Terry's nails in the course of leprosy, with 17% coincidence has also been demonstrated [20]. Additionally, Terry's nails have been reported in the course of chronic kidney disease, HIV/AIDS, tuberculosis, Reiter's disease, thyrotoxicosis, actinic keratosis, vitiligo, and Crow-Fukase Syndrome [4,5,8,21].

## **5. Conclusions**

Terry's nails can be observed in healthy people in the aging process as well as in the course of many pathophysiological processes. The systemic diseases most associated with the occurrence of Terry's nails are cirrhosis, heart failure, and adult-onset diabetes mellitus; however, the occurrence of these nail abnormalities was described in the course of many other systemic diseases. Examination of nails is an indispensable part of physical examination, and the demonstration of nail abnormalities should increase diagnostic alertness, because changes in nails may be the first symptom of systemic disease. For this reason, improving the knowledge of nail abnormalities may be helpful in the initial diagnosis of many systemic diseases.

## References

- [1] Baran B, Soyer OM, Karaca C. Terry's nail: an overlooked physical finding in cirrhosis. *Hepatobiliary Pancreat Dis Int.* 2013; 12(1): 109
- [2] Pitukweerakul S, Pilla S. Terry's Nails and Lindsay's Nails: Two Nail Abnormalities in Chronic Systemic Diseases. *J Gen Intern Med.* 2016; 31(8): 970
- [3] Holzberg M, Walker HK. Terry's nails: Revised definition and new correlations. *Lancet.* 1984; 1: 896–9
- [4] Khichar S, Choudhary S. Terry nails in a patient with chronic alcoholic liver disease. *Cleve Clin J Med.* 2014; 81: 603–4
- [5] Zaiac MN, Walker A. Nail abnormalities associated with systemic pathologies. *Clin Dermatol.* 2013; 31(5): 627-49
- [6] Terry R. White nails in hepatic cirrhosis. *Lancet.* 1954; 266(6815): 757-9
- [7] Roat, J, Zucker S.D. Terry Nails: A New Look at an Old Finding and its Association with Liver Disease. *Gastroenterology.* 2017; 152(5): 33–4
- [8] Witkowska AB, Jasterzbski TJ, Schwartz RA. Terry's Nails: A Sign of Systemic Disease. *Indian J Dermatol.* 2017; 62(3): 309–11
- [9] Li Z, Ji F, Deng H. Terry's nails. *Braz J Infect Dis .* 2012; 16(3): 311-2
- [10] Lakshmi BS, Ram R, Kumar VS. Terry's nails. *Indian J Nephrol.* 2015; 25: 184
- [11] Nia AM, Ederer S, Dahlem KM, Gassanov N, Er F. Terry's nails: a window to systemic diseases. *Am J Med.* 2011; 124(7): 602-4
- [12] Liberski S, Marczak D. Half and half nails: an important sign in the diagnosis of systemic diseases. *Journal of Education, Health and Sport.* 2018; 8(9): 518-26
- [13] Abdullah L, Abbas O. Common nail changes and disorders in older people: Diagnosis and management. *Can Fam Physician.* 2011; 57: 173–81
- [14] Baran R. The nail in the elderly. *Clin Dermatol.* 2011; 29(1): 54-60
- [15] Horan MA, Puxty JA, Fox RA. The white nails of old age (neapolitan nails). *J Am Geriatr Soc.* 1982; 30(12): 734-7
- [16] Möhrenschrager M, Abeck D, Ring J. Case report showed Muehrcke's nails, not Beau's lines. *BMJ.* 2003; 326(7380): 105
- [17] Terry R. Red Half-Moons in cardiac failure. *Lancet.* 1954; 264(6843): 843-4

- [18] Park KY, Kim SW, Cho JS. Research on the frequency of Terry's nail in the medical in patients with chronic illnesses. *Korean J Dermatol.* 1992; 30(6): 864-70
- [19] Jemec GB, Kollerup G, Jensen LB, Mogensen S. Nail abnormalities in nondermatologic patients: prevalence and possible role as diagnostic aids. *J Am Acad Dermatol.* 1995; 32(6): 977-81
- [20] Romero IB, Rincón JMR, Rabell FR. Nail involvement in leprosy. *Actas Dermosifiliogr.* 2012; 103(4): 276-84
- [21] Shelley WB, Shelley ED. The skin changes in the Crow-Fukase (POEMS) syndrome. A case report. *Arch Dermatol.* 1987; 123(1): 85-7