Perception of brittle nails in dermatologic patients: a cross-sectional study*

Percepção de unhas frágeis entre pacientes dermatológicas: um estudo transversal

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Abstract: Brittle Nails Syndrome is characterized by fragility of the nail plate, affecting 27% of women. We evaluated dermatology patients in a cross-sectional study about perception of nail fragility. One hundred and thirty-eight women were included, with median age of 36.5 years. Nail examination showed changes in 57% and 49% reported nail fragility. The first three fingernails were the most affected. Onychoschizia was related to onychophagia (OR = 3.29), housework (OR = 2.95) and water contact (OR = 2.44). Onychorrhexis had the strongest association with nail fragility perception (OR = 17.89). The fragility was more perceived by those who were black, of mixed race and atopic, and was associated with depressed mood.
Keywords: Asthma; Depression; Nail diseases; Race or ethnic group distribution; Risk factors

Resumo: A síndrome das unhas frágeis caracteriza-se por fragilidade da lâmina ungueal, acometendo 27% das mulheres. Realizamos estudo transversal com pacientes dermatológicas sobre a percepção de fragilidade ungueal. Avaliamos 138 pacientes com idade mediana de 36,5 anos. Ao exame, 57% apresentavam alterações e 49% relatavam fragilidade ungueal. Os três primeiros dedos das mãos foram os mais acometidos. A onicosquizia associou-se com onicofagia (OR = 3,29), trabalhos domésticos (OR = 2,95) e contato com água (OR = 2,44). A onicorrexe teve a mais forte associação com a percepção de fragilidade ungueal (OR = 17,89). A fragilidade foi mais percebida em negras, pardas e atópicas e associou-se com humor depressivo.
Palavras-chave: Asma; Depressão; Distribuição por raça ou etnia; Doenças da unha; Fatores de risco

Brittle Nails Syndrome (BNS) is characterized by increased fragility of the nail plate.[1] The prevalence of this alteration in women was 27%, according to a German study published in 1986; most of the affected persons considered it an important cosmetic problem, which interfered in daily life activities.[2,3] However, in our population no similar studies, or those that assessed the perception of nail fragility from the patient viewpoint, were identified, besides association of this perception with different nail alterations related to BNS.

We carried out a cross-sectional study with adult female patients from the outpatient dermatology clinic, through a standard questionnaire on clinical, demographic and personal care characteristics related to BNS. All of the dermatologic patients examined in the period were included, except those who already had dermatoses affecting nails. Subsequently, the nails of all women were examined according to van de Kerkhof (VDK) criteria for BNS.[1]

The variables were compared by bivariate analysis and by multiple logistic regression between the groups defined by nail fragility perception or not. The multivariate analysis was subjected to a backward-stepwise algorithm for reduction of the final model.

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The quantitative variables were represented by medians (1st and 3rd quartiles) and the categorical variables by percentages. The Mann-Whitney, Chi square and Fisher exact tests were used, considering p<=0.05 values significant.

We evaluated 138 patients, with a median age of 36.5 (26.0-45.0) years. Twenty-three patients were excluded for presenting diseases that affect the nails, especially onychomycoses (70%).

The main dermatoses were acne (29%), seborrheic dermatitis (26%), contact dermatitis (7%), hives, viral warts and vitiligo (6% each). Fifty-seven per cent of those examined had some kind of ungual alteration like onychoschizia, onychorrhexis, longitudinal pits or ridges, alteration of thickness or distal horizontal fissures, according to VDK criteria. The most frequently observed alteration was onychoschizia, found in 46% of the assessed patients, although the alteration most associated with perception of fragility was onychorrhexis (OR=17.89 [2.28-140.33]). Onychoschizia was mainly associated with onychophagia (OR=3.29 [1.09-9.94]), housework that traumatizes the nails (OR=2.95 [1.46-5.97]), and daily work in water (OR=2.44 [1.08-5.51]). Onychorrhexis was associated only with the smoking habit (OR=4.63 [1.36-15.79]). In addition, the occurrence of ungual alterations was more common in patients who reported family history of brittle nails (OR=3.59 [1.54-8.32]).

Forty-nine percent of the patients considered their nails fragile and 44% had difficulty in keeping them long; 94% presented the problem in their fingernails and only 6% in their toenails. As regards fingernails, the frequency of involvement from the first to the fifth was 86%, 87%, 88%, 72% and 53%, respectively. The median time since onset of the problem was 42 (12-84) months, although 40% referred having the problem since childhood.

Table 1 illustrates the studied characteristics according to the perception or not, by the patient, of having brittle nails, while table 2 shows multivariate analysis of these characteristics.

Table 1: Demographic and clinical characteristics of evaluated patients, according to perception of nail fragility

Variables studied		Brittle nail(n=68)	Non brittle nail (n=70)	Odds ratio (confidence interval 95%)	p
Demographic Characteristics					
Current age*		36.5 (24.0-45.0)	36.5 (26.0-46.0)	-	0.56
Color / race	White	79.41%	82.86%	Reference	-
	Black**	8.82%	1.43%	6.44 (0.75 to 55.28)	0.11
	Mixed**	11.76%	7.14%	1.72 (0.53 to 5.58)	0.40
	Oriental**	0.00%	8.57%	-	0.03
Clinical characteristics and morbid antecedents					
History of atopic dermatitis**		11.76%	4.29%	2.98 (0.76 to 11.74)	0.13
History of allergic rhinitis ***		33.82%	20.00%	2.04 (0.95 to 4.42)	0.07
History of asthma**		10.29%	0.00%	-	0.01
History of atopy***		41.18%	18.57%	3.07 (1.42 to 6.64)	<0.01
History of anemia**		11.76%	5.71%	2.20 (0.63 to 7.68)	0.24
Previous diagnosis of diabetes mellitus**		2.94%	2.86%	1.03 (0.14 to 7.53)	0.99
Previous diagnosis of hypothyroidism**		7.35%	8.57%	0.85 (0.25 to 2.92)	0.99
Hair loss complaint***		38.24%	32.86%	1.27 (0.63 to 2.54)	0.51
Use if hormonal contraceptive ***		30.88%	47.14%	0.50 (0.25 to 1.01)	0.05
Smoking habit**		16.18%	8.57%	2.06 (0.72 to 5.92)	0.20
Habits and personal hygiene					
Practice of regular physical exercise***		26.47%	31.43%	0.79 (0.38 to 1.64)	0.52
Daily work with water***		30.88%	15.71%	2.40 (1.05 to 5.46)	0.03
Daily contact with cleaning products***		33.82%	20.00%	2.04 (0.95 to 4.42)	0.07
Housework that may traumatize nails***		61.76%	50.00%	1.62 (0.82 to 3.18)	0.16
Has 3 or more meals per day***		65.67%	60.29%	1.26 (0.63 to 2.54)	0.52
Eats 6 or more portions of fruit or vegetables per day***		16.18%	15.71%	1.04 (0.42 to 2.58)	0.98
Eats dairy foods 3 or more times a day***		20.59%	24.64%	0.79 (0,36 to 1.77)	0.57
Eats meat more than 4 days per week***		77.94%	81.16%	0.82 (0.36 to 1.89)	0.64
Daily liquid intake (liters)*		1.1 (0.6-2.0)	2.0 (1.0-2.0)	-	0.06
Body mass index*		24.0 (22.0-28.0)	24.0 (21.0-29.0)	-	0.85

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Table 1: Demographic and clinical characteristics of evaluated patients, according to perception of nail fragility

Variables studied	Brittle nail(n=68)	Non brittle nail (n=70)	Odds ratio (confidence interval 95%)	p
How many times a day wets and dries hands*	15.0 (10.0-20.0)	15.0 (10.0-20.0)	-	0.74
How many times a day washes hands with soap*	10.0 (10.0-20.0)	10.0 (10.0-20.0)	-	0.85
Applies alcohol on hands more than twice a day***	32.35%	44.29%	0.60 (0.30 to 1.20)	0.15
First degree family members who have brittle nails***	39.71%	18.57%	2.89 (1.33 to 6.26)	0.01
Refers difficulty in keeping nails long***	69.12%	20.00%	8.95 (4.11 to 19.52)	<0.01
Refers slow nail growth***	45.59%	15.71%	4.49 (2.02 to 10.01)	<0.01
Has a manicure more that twice a month***	42.65%	47.14%	0.83 (0.43 to 1.63)	0.60
Removes cuticles more that twice a month***	25.00%	44.29%	0.42 (0.20 to 0.86)	0.02
Bites nails regularly**	17.65%	7.14%	2.79 (0.92 to 8.39)	0.07
Findings at nail examination				
Normal nails***	20.59%	64.29%	0.14 (0.07 to 0.31)	<0.01
Onychoschizia***	66.18%	25.71%	5.65 (2.71 to 11.78)	<0.01
Horizontal distal fissure of nail plate**	26.47%	10.00%	3.24 (1.25 to 8.37)	0.01
Longitudinal pits and ridges**	14.71%	10.00%	1.55 (0.55 to 4.34)	0.45
Onychorrhexis**	20.59%	1.43%	17.89 (2.28 to 140.33)	<0.01
Alteration in nail thickness**	16.18%	4.29%	4.31 (1.15 to 16.21)	0.02
Questions on mood				
Feels nervous most days***	47.06%	35.71%	1.60 (0.81 to 3.17)	0.18
Feels worried most days***	36.76%	30.00%	1.36 (0.67 to 2.76)	0.40
Feels depressed most days**	27.94%	8.57%	4.14 (1.54 to 11.14)	<0.01
Diminished interest in routine activities most days**	23.53%	10%	2.77 (1.06 to 7.24)	0.04
Answers compatible with depressed mood***	41.18%	22.86%	2.36 (1.13 to 4.94)	0.02

* Non parametric Mann-Whitney test, data represented by the median (1st quartile-3rd quartile).
** Fisher exact test, data represented by percentages.
*** Chi Square test, data represented by percentages.

Table 2: Multivariate analysis of the characteristics studied according to their association with perception of brittle nails (n=138)*

Variable	Odds ratio	Confidence interval 95%	p
Blacks or mixed race	4.75	1.36 - 16.59	0.01
Atopic antecedents	3.55	1.39 – 9.05	0.01
Use of hormonal contraceptive	0.59	0.25 – 1.41	0.24
Smoking habit	2.42	0.62 – 9.43	0.20
Bites nails regularly	2.79	0.70 - 11.16	0.15
Alterations at physical nail examination	7.62	2.65 – 21.87	<0.01
First degree family members who have brittle nails	1.92	0.75 - 4.93	0.17
Feels depressed most days	4.08	1.24 – 13.50	0.02
Constant	0.22	-	-

***Correct classification=**84.3%; p (model) < 0.001; **Nagelkerke R2 =** 0.416; Final model after reduction through backward-stepwise algorithm, maintaining variables with p<0.3.

The perception of brittle nails among dermatologic patients was quite frequent and possibly greater than in the general population. A study carried out in Germany, in 1986, stated that 27% of women presented alterations at nail examination.[2] In our study, 57% of the examined women had some kind of alteration compatible with VDK criteria.[1] Besides the fact that these populations were different, the methodologies used at nail examination might explain such variability among the prevalences found.

The observation of racial differences in complaints does not necessarily indicate a preponderant genetic factor, as cultural and socioeconomic factors not analyzed in this study should also be considered. On the other hand, although the perception studied is subjective, it was significantly associated with the abnormalities found during physical examination.

Interestingly, there was a positive association between perception of fragile nails and atopic antecedents, mainly asthma; however, the occurrence of ungual plate abnormalities was not related to the occurrence of atopy (OR=0.61 [0.29-1.28]) and there were no trachyonychia cases. Such incompatibility may be due to memory biases, so that patients who remember respiratory allergies, usually in childhood, could be more observant and careful about their fingernails, with more complaints of ungual fragility; nevertheless, we must not ignore that a differentiated keratinization pattern in atopic individuals could results in more noticeable fragility of the nails.[4]

The most involved fingers were also those more subjected to effort and traumas, indicating the role of external causes in BNS, mainly in onychoschizia findings.[5] However, cosmetic nail care was not associated with higher risk for BNS. Furthermore, we found that regularity of cuticle removal was lower among those who complained. We cannot establish a causal relationship due to the study design, but we believe that the women who perceive nail fragility may manipulate them less frequently, to avoid exacerbation of the problem, or present slower growth of nails and surrounding tissues, requiring less care.

Onychorrhexis was an uncommon finding in our study (11%) and was shown to be associated only to the smoking habit, although we did not find such correlation in the literature, indicating that this should be examined in larger studies.

We may conclude that the perception of brittle nails in dermatologic patients at a public outpatient clinic is quite frequent and of long duration. This observation seems to be more common in patients who are black or of mixed race and in patients with history of atopy, in addition to being associated with the presence of depressive disorders, indicating a possible impact on the quality of life of those who experience them, similarly to what occurs with hair loss perception.[6] ❑

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