P-0688 – What features of neuropathy make patients aware of their disease?

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Given the subjective nature of symptoms and the differences in recognizing the features of diabetic neuropathy (DN), patients can be unaware of their difficult to understand condition even if healthcare providers have discussed and explained the diagnosis of DN. The objective of our study was to explore what features of DN make patients aware of DN.

This cross-sectional survey was conducted in 2016, in which 47 healthcare providers from 21 Romanian cities distributed the linguistically translated Romanian Norfolk Quality of Life (QoL-DN) questionnaire to patients with diabetes from their clinics who participated in 2012 in a previously reported screening study in Romania. Patients were evaluated for DN with the Michigan Neuropathy Screening Instrument (MNSI) and MNSI questionnaire. Only patients who give their informed consent to Norfolk QOL-DN and MNSI were included.

Those patients (1484) who had the MNSI combined score ≥ 3.5 were determined to have DN and resulted in 2 study groups: Group A, 357 (24.1%) responded “no” to the question “Do you have neuropathy” while Group B, 1127, (75.9%) responded “yes” to the question. Two groups (C and D) with MNSI combined scores less than 3.5 were determined not to have DN by MNSI. Group C (75) responded “yes” to the question, “Do you have neuropathy” and group D (325) responded “no” to the question (Fig.1).

Figure 1. The study groups diagram

The DN frequency in the study group was 78.8% (patients with MNSI ≥ 3.5). Analysis of scores between groups showed significant differences between Total QoL-DN (Total: A= 22.71 $\pm$ 1.01, B=37.53 $\pm$ 0.76, C=10.39 $\pm$ 1.58, D=4.77 $\pm$ 0.49, $p < 0.001$) (Fig.2).

Figure 2. Progression of Total Norfolk QOL-DN scores from normal MNSI and denial of neuropathy to highest MNSI and those who acknowledged presence of neuropathy.

Multivariate logistic models evaluated the association between the symptoms, Norfolk QoL-DN subdomain scores and the probability of patients' awareness of their DN (Table 1 and 2).

Numbness, pins and needles, unusual sensations are the most prominent predictors of perception of neuropathy and QOL-DN subdomains are able to detect neuropathy even in the absence of positive MNSI scores and in those who deny the presence of neuropathy (Group D) (Fig.3).

There appears to be a threshold of doubling of numbness and pins and needles (OR 2.03 and 1.85), which alerts patients to the presence of neuropathy.

Figure 3. Frequencies of the symptoms in the study groups i. Numbness symptom frequency; ii. Pins and needles symptom frequency; iii. Electric shocks symptom frequency; iv. Weakness symptom frequency; v. Superficial pain symptom frequency; vi. Deep pain symptom frequency; vii. Unusual sensation symptom frequency.

Table 1. Multivariate logistic models evaluating the association between the symptoms, Norfolk QoL-DN subdomain scores and the probability of being in one of the study groups A or B (Forward LR)

Independent variable	OR	95% CI	p
With numbness	2.03	1.39-2.97	<0.001 ⁺
With pins and needles	1.85	1.28-2.66	0.001 ⁺
With unusual sensations	1.67	1.11-2.50	0.014 ⁺
With superficial pain	1.67	1.26-2.18	<0.001 ⁺
Physical functioning/large fibers neuropathy score	1.03	1.01-1.04	0.002 ⁺
Autonomic neuropathy score	1.13	1.05-1.22	0.001 [*]
Small fiber score	1.24	1.14-1.35	<0.001 ⁺

^{*} = higher likelihood to be in group A; ⁺ = higher likelihood to be in group B; OR, odds ratio; CI, confidence interval

Table 2. Multivariate logistic models evaluating the association between the symptoms, Norfolk QoL-DN subdomain scores and the probability of being in one of the study groups C or D (Forward LR)

Independent variable	OR	95% CI	p
With numbness	2.03	1.39-2.97	<0.001 [*]
With unusual sensations	1.67	1.11-2.50	0.014 [*]
Physical functioning/large fibers neuropathy score	1.03	1.01-1.04	0.002 [*]

^{*} = higher likelihood to be in group C; ⁺ = higher likelihood to be in group D; OR, odds ratio; CI, confidence interval