Reliability and validity of a Lithuanian version of Leicester Cough Questionnaire

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ABSTRACT: *Cough is the most common presenting symptom in primary practice. [1] Chronic, exhausted cough has a significant impact on the quality of life. [2] Cough questionnaire was developed to evaluate the quality of life for patients with chronic cough. Unfortunatelly, such kind of health status measurement do not exist in Lithuania yet. The translation of Leicester Cough Questionnaire (LCQ) was made using all methods that are required, following a forward-backward translation procedure. The Questionnaire and Visaul Analogue Scale (VAS) was completed by 53 patients with chronic cough (duration of cough > 8 weeks). The Questionnaire was divided into three domains: physical, psychological and social. To validate LCQ we tested three different aspects, i.e. the concurrent validity, the internal consistency and the repeatability. A strong correlation was established among the domains of the questionnaire and a statistically significant correlation established between the questionnaire and VAS. Cronbach`s alpha coefficients for the internal consistency were from 0,787 to 0,927. The intraclass correlation coefficient (ICC) of the test – retest reliability was 0,89 (p<0,0001). The Lithuanian version of Leicester Cough Questionnaire is ready, compatible with original and understandable for patients. Leicester Cough Questionnaire appears to be valid, reliable and highly responsive.*
KEYWORDS: *cough, questionnaire, validation.*

I. INTRODUCTION

Cough is one of the most common causes of presentation to general practice. Cough that has been persisted longer than three weeks is subacute (three to eight weeks) or chronic (more than eight weeks) About 15 precentages of non smoking people complain about the chronic cough [1]. Chronic cough is the most common complain during the visit to a pulmonologist. Cough is described as a protective reflex that removes excessive secretions and inhaled foreign bodies from the respiratory tract. The anatomy of respiratory tract which is plentiful of cough receptors is the reason, that the most frequently causes of chronic cough are upper airway disorders, asthma and gastroesophageal reflux. There is some controversy if these conditions are aggravants or causes of cough. What is more, many people have a cough reflex sensitivity and their cough cannot be expalined. [2,3]

Patients with chronic cough suffer physical and psychological morbidity. Long lasting chronic cough can affect the quality of life interfering with physical symptoms as chest pain, syncope, incontinence, sore throat and headaches. What is more, people are more depressed, feel anxiety or social embarrassment of their cough. It can dissturb not only work and activity but also family members and friends. [2-6]

To effectively evaluate the impact of chronic cough on quality of life, it is important to have valid measurement tools. A number of measurment tools including questionnaires, cough diaries, visual analogue scales, electronic recordings, and human counts are available to assess the impact of quality of life for people with chronic cough. However there exists no questionnairs to evaluate quality of life for patients with chorinc cough in Lithuania. So we have made a validation of LCQ by using all required methods that have been used to validate the LCQ in other languages. [7-10]

II. METHODS

Questionnaire

The Leicester Cough Questionnaire is designed to assess the quality of life for patients with chronic cough. [10] It has 19 questions and it is devided into 3 domains: physical, psychological and social. In all questions you can get from 0 to 7 points. Higher result show better quality of life.

Translation procedure

The translation of LCQ was made using all methods that are required. [7-10] The translation followed forward-backward translation procedure, with two independent translations to lithuanian language. One of the translations was done by the professional translator and another by the doctor who has basic knowledge of medical translations from english. Both translations of the questionnaire were discussed by the professional translators, doctors and specialists of lithuanian language. The translations were matched paying particular

attention to the correct translation of phraseological expressions. That is how the first version of questionnaire was made. The trial version of questionnaire was tested in 20 patients with chronic cough in case to find out about the problems in comprehension and comprehension of the questionnaire. All patients pointed that the questions are understandable so the final version of lithuanian version of Leicester cough questionnaire was made.

Patients
The Questionnaire and Visaul Analogue Scale (VAS) was completed by 53 patients with chronic cough (duration > 8 weeks). Spirometry and BHR (Bronchial Hyperreactivity) were normal by the day patients reffered to the clinic.

Validation
The Questionnaire was devided into three domains: physical, psychological and social. To validate LCQ we tested three different aspects, i.e. the concurrent validity, the internal consistency and the repeatability.

Concurrent validity
Concurrent validity was tested by comparing correlations among all the domains of the questionnaire and by calculating the correlation between the questionnaire and specific cough VAS. A correlation coefficient < 0,5 is accepted as weak, $\geq 0,5$ as moderate and > 0,7 as strong correlation.

Internal consistency
The internal consistency was calculated by Cronbach`s alpha coefficients for three domains. This coefficient specify the extent to which questions are related. Internal consistency is generally accetable if Cronbach`s alpha is >0,7.

The repeatability
The repeatability (or test-retest reliability) reveals the stability of scores over the time. The repeatability was determined by comparing the scores of the first visit to the clinic with the scores of the visit after three weeks who reported their cough unchanged. To calculate the repeatability of questionnare the Intraclass Correlation Coefficient (ICC) was used. Responsiveness of a questionnaire demonstrates changes over time. We determined the responsiveness by comparing results of the first visit and the visit after 6 months.

Statistical analysis
SPSS version 20 was used for data analysis. Concurrent validity was determined by comparing LCQ with Visual Analogue Scale (VAS). We calculated the correlation between all domains and total questionnaire. The Pearson correlation coefficient was used. Cronbach`s alpha coefficient was used for the internal consistency. Analysis of the test-retest reliability was done by calculating the Intraclass Correlation Coefficient (ICC) for the three domains and for the total score. Responsiveness was analysed by calculating the 95% confidence interval for the average improvements in the three domain scores and the total score of the LCQ. [7-16]

III. RESULTS
The final version of lithuanian version of Leicester cough questionnaire was made after two foward – backward translations and discussion of correct translation of phraseological expressions. The Questionnaire was completed by 53 patients. Respiratory function was normal by the day patients refer to the clinic. The main characteristics of the patients are shown in table 1.

Table 1. Characteristics of the patients

Patient characteristics		
N		53
Gender	Males (n/pct.)	12 /22,64
	Females (n/pct.)	41 /77,36
Age		47,75 ± 14,89
Duration of cough		32,245 ± 45,87
BHR (possitive n/pct.)		26 /49,06%
Smoking (n/pct.)		14 /26,4
Pack – years		15
VAS (mm)		50,06 ± 24,36

A strong correlation was established among the domains of the questionnaire: the strongest between psychological and social (r=0,891, p<0,01), the weakest between physical and social (r=0,732, p<0,01). The statistically significant correlation established between the questionnaire and VAS (r=-0,396, p<0,01). The weak correlation established between the domains of the questionnaire and VAS: physical (r=-0,329, p<0,01), psychological (r=-0,406, p<0,01) and social (r=-0,365, p<0,01). It demonstrates the logical identity of the questionnaire.

Cronbach`s alpha coefficients for physical, psychological, social domains and for total questionnaire were 0,787, 0,863, 0,835 and 0,927.
The intraclass correlation coefficient (ICC) of the repeatability (test – retest reliability) was 0,89 (p<0,0001). The results are compared with the original LCQ and Dutch version of LCQ. Shown in table 2.

Table 2. The repeatability of the questionnaire

Repeatability				
	Itraclass correlation coeficient (ICC)			CI 95pct. p<0,0001
Domain LCQ	Merkyt □	Birring (original)	Zwolle (Dutch version)	
Physical	0,86	0,93	0,86	0,76 – 0,92
Social	0,88	0,90	0,93	0,88 – 0,96
Psychological	0,90	0,88	0,93	0,87 – 0,96
Total	0,89	0,96	0,93	0,87 – 0,96

The results after 6 months reported a significant improvment in each of the domains of the LCQ. The results are shown in table 3.

Table 3. The responsiveness of the questionnaire

Table 3		
Responsiveness		
Domain	Improvement score After 6 months	CI 95pct.
Physical	1,24	1,01 – 1,48
Social	1,78	1,54 – 1,93
Psichological	1,96	1,70 – 2,14
Total	4,98	4,06 – 5,87

IV. CONCLUSION

The Lithuanian version of Cough Quality – of – Life Questionnaire is ready, compatible with original and understandable for patients. The Cough Quality – of – Life Questionnaire appears to be valid, reliable and highly responsive.

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REFERENCES

[1].   Irwin RS, Baumann MH, Bolser DC, et al. Diagnosis and management of cough executive summary: ACCP evidence-based clinical practice guidelines. Chest 2006; 129:1S

[2].   Chamberlain S. A. F., Garrod R., Douiri A., Masefield S., Powell P., Bucher C., et al. The Impact of Chronic Cough: A Cross-Sectional European Survey. Lung (2015) 193:401–408

[3].   Martin MJ, Harrison TW. Causes of chronic productive cough: An approach to management. Respiratory Medicine. 2015 Sep;109(9):1105-13

[4].   McCrory DC, Coeytaux RR, Yancy WS Jr., Schmit KM, Kemper AR, Goode A, Hasselblad V, Heidenfelder BL, Irvine RJ, Musty MD, Gray R, Sanders GD. Assessment and Management of Chronic Cough. Comparative Effectiveness Review No. 100. (Prepared by the Duke Evidence-based Practice Center under Contract No. 290-2007-10066-I.) AHRQ Publication No. 13-EHC032-EF. Rockville, MD: Agency for Healthcare Research and Quality; January 2013.

[5].   Birring S. S., Matos S, Patel R. B., Prudon B., Evans D. H., Pavord I. D. Cough frequency, cough sensitivity and health status in patients with chronic cough. Respiratory Medicine (2006) 100, 1105 – 1109.

[6].   Irwin RS, Curley FJ, French CL. Chronic cough. The spectrum and frequency of causes, key components of the diagnostic evaluation, and outcome of specific therapy. Am Rev Respir Dis 1990; 141:640.

[7].   Farida F Berkhof, Lisenka N Boom, Nynke E ten Hertog, Steven M Uil, Huib AM Kerstjens, and Jan WK van den Berg. The validity and precision of the leicester cough questionnaire in COPD patients with chronic cough. Health Qual Life Outcomes. 2012; 10: 4.

[8].   Jae-Woo Kwon, Ji-Yong Moon, Sae-Hoon Kim, Woo-Jung Song, Min-Hye Kim, Min-Gyu Kang, et al. The reliability and validity of korean version of Leicester Cough Questionnaire. Allergy and Clinical ImmunologyAllergy Asthma Immunol Res. 2015 May;7(3):230-233.

[9].   Arnold N Huisman, Mei-Zei Wu, Steven M Uil and Jan Willem K van den Berg. Reliability and validity of a Dutch version of the Leicester Cough Questionnaire. Cough, 21 February 2007.

[10].   Birring SS, Prudon B, Carr AJ, Singh SJ, Morgan MDL, Pavord ID. Development of a symptom specific health status measure for patients with chronic cough: Leicester Cough Questionnaire (LCQ). Thorax; 2003.

[11].   Lohr KN, Aaronson NK, Alonso J, Burnam MA, Patrick DL, Perrin EB, Roberts JS. Evaluating quality-of-life and health status instruments: development of scientific review criteria. Clin Ther; 1996.

[12].   French CT, Irwin RS, Fletcher KE, et al. Evaluation of a cough-specific quality-of-life questionnaire. Chest; 2002.

[13].   Schmit K. M., Coeytaux R. R., Goode A. P., McCrory D. C., Yancy Jr W. S., Kemper A. R., et al. Evaluating Cough Assessment Tools. Chest 2013; 144(6):1819-1826.

[14].   Boulet L. P., Coeytaux R. R., McCrory D. C., French C. T., Chang A. B., Birring S. S., et al. ools for Assessing Outcomes in Studies of Chronic Cough. Chest 2015; 147(3):189-195.

[15].   Spinou A, Birring SS. An update on measurement and monitoring of cough: what are the important study endpoints? J Thorac Dis 2014;6(S7):S728-S734.

[16].   Field A. Discovering Statistics Using SPSS. London; 2009.