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Validation of a Disease-Specific Questionnaire for Health-Related Quality of Life in Thai Patients with Blepharospasm

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Abstract:

Objective: *To investigate the reliability and validity of the Thai version of the "Disease-Specific Questionnaire for Health-Related Quality of Life" in patients with Blepharospasm (BS) and their response to botulinum toxin treatment.*

Study design: *Cross-sectional study.*

Materials and methods: *Twenty patients with BS were asked to complete a newly developed Thai version of the 25-item National Eye Institute Visual Functional Questionnaire (NEI-VFQ-25) as well as a six-point disability rating scale before and between four and six weeks after botulinum toxin injections. Peak improvement (0-100%) in the condition was also evaluated between four and six weeks after treatment. Before their treatment commenced all the patients were asked to answer the existing Thai SF-36 questionnaire to help test for the correlation with the Thai NEI-VFQ-25. A second group of ten patients who had no injections completed the Thai NEI-VFQ-25 and then a second identical copy after a two-week interval. Subsequently the reliability, validity and responsiveness were analysed.*

Results: *The Thai NEI-VFQ-25 showed a Cronbach's alpha coefficient of 0.80 and no significant difference in test-retest reliability. The total content validity was 0.8 (range 0.7-1.0). There was good correlation between the Physical Health part of the Thai NEI-VFQ-25 and Thai SF-36 ($r = 0.58$, $p<0.01$). However, the correlation between the Mental Health part of the Thai NEI-VFQ-25 and the SF-36 was not so strong ($r=0.39$). The Thai NEI-VFQ-25 also demonstrated a response to treatment similar to the six-point disability rating scale and the peak improvement.*

Conclusion: *The Thai NEI-VFQ-25 is a reliable, valid and responsive instrument for disease-specific health-related quality of life assessment.*

Key words: *blepharospasm, Thai NEI-VFQ-25, validity*

บทคัดย่อ:

วัตถุประสงค์: *เพื่อทดสอบความน่าเชื่อถือและความแม่นยำของแบบสำรวจคุณภาพชีวิตเฉพาะโรคฉบับภาษาไทยสำหรับผู้ป่วยโรคตากระพริบค้าง รวมถึงการตอบสนองต่อการรักษา*

แบบวิจัย: *การศึกษา ณ เวลาใดเวลาหนึ่ง*

วัสดุและวิธีการ: *ผู้ป่วยโรคตากระพริบค้างจำนวน 20 รายตอบแบบสอบถามในแบบสำรวจคุณภาพชีวิตเฉพาะโรคตากระพริบค้าง-25 ฉบับภาษาไทย (แบบสำรวจ-25) ซึ่งได้รับการพัฒนาแล้ว และประเมิน 6-ระดับความพิการก่อนและระหว่าง 4-6 สัปดาห์หลังการฉีดยาโบทูลินั่มท๊อกซิน ประเมินอาการดีที่สุด เป็นร้อยละระหว่าง 4-6 สัปดาห์หลังการฉีดยา ผู้ป่วยตอบแบบสำรวจสุขภาพทั่วไป-36 ฉบับภาษาไทย (แบบสำรวจ-36) ก่อนการรักษา ผู้ป่วยอีกกลุ่ม 10 รายตอบแบบสำรวจ-25 2 ครั้งห่างกัน 2 สัปดาห์ วิเคราะห์ความน่าเชื่อถือ ความแม่นยำ และการตอบสนองต่อการรักษาของแบบสำรวจ*

ผลการศึกษา: *การทดสอบแบบสำรวจ-25 พบว่ามีค่า Cronbach's alpha เท่ากับ 0.8 ความน่าเชื่อถือเมื่อทำซ้ำมีค่าไม่ต่างกัน ค่าความถูกต้องของเนื้อหาเท่ากับ 0.8 (0.7-1.0) และพบว่ามีความสัมพันธ์อย่างมีนัยสำคัญทางสถิติระหว่างกลุ่มสุขภาพทางกาย (physical health part) ของแบบสำรวจ-25 และแบบสำรวจ-36 ($p < 0.01$) อย่างไรก็ตามกลุ่มสุขภาพทางจิตใจ (mental health part) ของแบบสำรวจ-25 และแบบสำรวจ-36 มีความสัมพันธ์กันแต่ไม่มีนัยสำคัญทางสถิติ ($r = 0.39$) แบบสำรวจ-25 แสดงการตอบสนองต่อการรักษาคล้ายคลึงกับการวัด โดย 6-ระดับความพิการ และอาการดีที่สุดหลังการรักษา*

สรุป: *แบบสำรวจคุณภาพชีวิตเฉพาะโรคตากระพริบค้าง-25 ฉบับภาษาไทย เป็นเครื่องมือที่มีความน่าเชื่อถือความแม่นยำ และไวต่อการเปลี่ยนแปลง สำหรับการประเมินคุณภาพชีวิตเฉพาะโรค*

คำสำคัญ: *ความแม่นยำ, แบบสำรวจคุณภาพชีวิตเฉพาะโรคตากระพริบค้าง-25 ฉบับภาษาไทย, โรคตากระพริบค้าง*

Introduction

Blepharospasm (BS) is a chronic disorder but the etiology is usually unknown.[1] It is characterised by bilateral involuntary contractions of the orbiscularis oculi muscles leading to intermittent or sustained eye closure[1] which can interfere with the visual function and cause functional blindness, thus reducing the quality of a patient's life.[2-4] Botulinum toxin type A is now considered as the treatment of choice in patients with essential blepharospasm and has received food and drug administration (FDA) approval[5].

Health-related quality of life (HRQOL) is a subjective multidimensional evaluation of a person's perceptions of and satisfaction with various aspects of their life. Aassessments of HRQOL can be measured with generic or disease-specific instruments. The generic instruments, for example the Medical Outcome Study-Short Form 36, compares the general outcome across different diseases. These generic instruments cannot, however, give insight into the consequences of specific problems of a disease, and disease-specific instruments better demonstrate the impacts of the specific disease on a patient.[6]

To the best of our knowledge, there is no validated disease-specific HRQOL instrument for blepharospasm in Thailand. Thus this study was undertaken to investigate the reliability and validity of a Thai version of the disease-specific HRQOL questionnaire and in particular the 25-item National Eye Institute Visual Function Questionnaire (NEI-VFQ-25)[7] for patients with blepharospasm and at the same time their response to botulinum toxin treatment.

Materials and methods

1. Questionnaires

With the kind permission of Mangione, et al.[7], the NEI-VFQ-25 was translated by a competent, experienced medical translator into the Thai language. Then independently a second translator translated the questionnaire back into English. The final step involved correcting the differences between

the original version and the back-translated version. The questionnaire consisted of twelve subscales with a total of 26 items: general health (1 item), general vision (1 item), near vision (3 items), distance vision (3 items: formerly 2 items), driving (3 items), peripheral vision (1 item), colour vision (1 item), ocular pain (2 items), role limitation (2 items), dependency (3 items), social function (2 items), mental health (4 items). Each of the subscale scores ranged from 0 (the lowest) to 100 (the best possible score).

The medical outcome study 36-item short form health survey (SF-36)[8] is a widely used generic HRQOL questionnaire containing eight domains divided into two parts: Physical Health (physical functioning, role limitations due to physical health, bodily pain, and general health) and Mental Health (vitality, social functioning, role limitations due to emotional problems, and mental health). A Thai version of the SF-36 has been developed, validated and tested for reliability in Thai patients with mental disorders.[9]

2. Subjects

This study was approved by the Ethics Committee of the Faculty of Medicine, PSU and written informed consent was obtained from each patient prior to testing. Two separate groups of patients with primary blepharospasm were used to test the validity and reliability of the questionnaire. The first group had 20 and the second 10 patients, all of whom were attending the out-patient botulinum toxin clinic at Songklanagarind Hospital. The exclusion criteria were: 1) secondary causes of blepharospasm, 2) patients with eyelid opening apraxia, 3) concomitant chronic debilitating illness or other movement disorder, and 4) unable to read or understand Thai.

In the first group, all participants independently completed the self-rating questionnaire of the Thai NEI-VFQ-25 before receiving the botulinum toxin injection and then completed another identical questionnaire between four and six weeks after the injection to assess their response to the treatment. Additionally, the patients were asked to answer the Thai SF-36 questionnaire before any treatment commenced to test the construct validity of the Thai NEI-VFQ-25 version.

The second group of patients did not receive the injection and were asked to answer the self-rating Thai NEI-VFQ-25 version questionnaire twice (at the start and after two weeks) to assess the test-retest reliability.

3. Assessment of severity and response to treatment

Before giving the injection, a neurologist examined the severity of the disease using the Blepharospasm Severity Rating Scale[10], which has four grades: 0 = no blepharospasm present, 1 = increased blinking, 2 = mild, sustained contractions, 3 = forceful contractions, and 4 = severe, forceful contractions. The patients also subjectively evaluated their own condition using a 6-point disability rating scale[11] with 0 = normal, 1 = mild discomfort or functional impairment, 2 = mild to moderate discomfort or functional impairment, 3 = moderate discomfort or functional impairment, 4 = moderate to severe discomfort or functional impairment, 5 = severe discomfort or functional impairment, and 6 = completely disabled or incapacitated. The response to the treatment was subjectively assessed by the individual patients between four and six weeks after the injections, using self-assessments of both peak improvement (0-100%) as well as redoing the

6-point disability rating scale. Any side effects after treatment were also recorded and all the patients were examined by a neurologist who was blinded to the patient's questionnaire answers.

4. Statistical analyses

The reliability of the new questionnaire was tested using test-retest and internal consistency. These two methods were measured using the Wilcoxon Signed Ranks test and Cronbach's Alpha Coefficient of the total scores respectively. A Cronbach's alpha coefficient greater than 0.7 and with no significant difference between the initial and follow up scores (test-retest) were considered as indicating good reliability.

The Thai NEI-VFQ-25 was evaluated by expert neurologists for its relevance to the specific domain and validity across the Thai culture. Each item was graded into three levels (0 = not relevant; 0.5 = moderately relevant; 1 = very relevant). After evaluation, was calculated using the mean score of all the items scores with a mean score greater than 0.5 also being considered as an accepted content validity.

The various subscales in the Thai NEI-VFQ-25 were grouped under two headings: Physical Health (general health, general vision, near vision, distance vision, peripheral vision, colour vision, ocular pain, and role limitation) and Mental Health (dependency, social function, and mental health). It was decided the subscale "driving" should not be included under Physical Health because few patients (7 of 20) could actually drive. Construct validity was assessed with Spearman Rank correlation in which the correlation between the scores of Physical and Mental Health in the Thai NEI-VFQ-25 and those of the Thai SF-36 were tested.

The mean scores of each subscale in the questionnaire and the 6-point disability rating scale for the before and after botulinum toxin injection were compared using the Wilcoxon Signed Ranks test to evaluate the degree of patient responsiveness. Statistical significance was defined as $p < 0.05$. All the data analysis was performed by computer with SPSS for Windows version 11.5.

Results

The first group of 20 patients consisted of 16 females and four males. Eleven were newly diagnosed and had never received botulinum toxin injection (de novo patients), and the other nine had previously had multiple injections. The mean age was 58.0 ± 11.2 years, with symptom duration of 5.3 ± 4.7 years. The average disease severity was 2.4 (range from 0-4). Additional background information is shown in Table 1. The only side effect of the treatment noted was mild eyelid weakness, which occurred in only one (5%) patient and lasted for a week.

Table 1 Group 1 patients baseline characteristics (n = 20)

Mean disease duration (years ± SD)	5.3 ± 4.7
Married	14 (70%)
Employment rate (only patients < 60 years)	7 (35%)
Education: < 7 years	10 (50%)
> 7 years	10 (50%)

The 10 patients in the second group had a mean age of 64.0 ± 6.7 years and included 7 females. The reliability evaluation of the Thai NEI-VFQ-25 was carried out by this group and produced a Cronbach's alpha coefficient of 0.80 and no significant difference between the test-retest using Wilcoxon Signed Rank test.

The content validity was 0.84 (range 0.7-1.0) with a strong correlation seen between the Physical Health part of the Thai NEI-VFQ-25 and the Thai SF-36 ($r = 0.58$, $p < 0.01$). However, the Mental Health part of the Thai NEI-VFQ-25 and the Thai SF-36 was not so strong ($r = 0.39$) (Table 2).

All the patients in the first group showed an improvement after the injections and had a mean peak improvement score of 88.3%. The six-point disability rating scale also improved significantly after treatment (3.5 ± 2.1 cf. 0.5 ± 1.0, $p = 0.005$). The mean score of general health, driving, ocular pain, and social function showed a significant changebetween the before and after injection state (Table 3).

Table 2 Spearman Rank Correlation between the Thai NEI-VFQ-25 and Thai SF-36 (n = 20)

Thai NEI-VFQ-25	Thai SF-36	
	Physical health	Mental health
Physical health	0.58**	0.52*
Mental health	0.54*	0.39

*p < 0.05, **p < 0.01

Table 3 Mean scores of each subscale of Thai NEI-VFQ-25 before and after botulinum toxin injections (n = 20)

Subscales	Before injection (mean ± SD)	After injection (mean ± SD)	p
General health	31.3 ± 22.8	43.7 ± 20.0	0.01
General vision	65.8 ± 15.8	70.3 ± 12.5	0.30
Near vision	67.3 ± 23.2	63.9 ± 20.7	0.55
Distance vision	61.3 ± 27.4	62.1 ± 20.8	0.93
Driving (n=7)	59.5 ± 19.0	70.8 ± 16.7	0.03
Peripheral vision	64.0 ± 29.5	63.0 ± 30.6	0.78
Colour vision	83.0 ± 22.7	90.8 ± 12.4	0.19
Ocular pain	66.8 ± 26.1	74.5 ± 18.4	0.02
Role limitation	48.1 ± 26.4	54.4 ± 24.8	0.16
Dependency	60.0 ± 27.1	62.1 ± 28.7	0.67
Social function	59.5 ± 28.0	73.5 ± 19.8	0.002
Mental health	59.2 ± 28.6	62.4 ± 27.3	0.36

Discussion

An ideal HRQOL instrument should demonstrate good reliability, validity and high sensitivity to detect any change that has occurred.[12] The Thai version of the NEI-VFQ-25 demonstrated a Cronbach's alpha coefficient of 0.88 for the total scale and no significant difference between the initial and follow up scores, indicating a good reliability. Our study has demonstrated the validity of the Thai NEI-VFQ-25 through its good content validity of 0.84 and acceptable construct validity from the significant correlation seen between the Physical Health part of the Thai NEI-VFQ-25 and the Thai SF-36. However, the correlation between the Mental Health part of the Thai NEI-VFQ-25 and the Thai SF-36 was not so strong.

By comparing each of the subscale scores before and after treatment our study could examine the sensitivity to change of the Thai NEI-VFQ-25, which did show a significant change in the general health, driving ocular pain and social function domains of our study population. We also All the aforementioned does indicate that BS has an effect on both physical and mental health.

Many reports from Thailand have confirmed the effectiveness of botulinum toxin in the treatment of blepharospasm.[13-14] However, the assessment of its value has only been clinically based, for example, peak improvement, duration of treatment and side effects. A previous report of ours assessed post-treatment condition by the duration of treatment, side effects, peak improvement and the 6-point disability scale.[14] The 6-point disability scale is an accepted measure of how much overall discomfort is felt or function is impaired[11] but does not, however, show the consequences of blepharospasm in much detail. HRQOL is an important tool in the evaluation of multiple dimensions of life in patients with chronic diseases such as blepharospasm, which should also be assessed specifically by a disease-specific HRQOL. Although our study demonstrated a peak improvement of 88.3% and significant improvements in the 6-point disability rating scale, it should be noted that the Thai NEI-VFQ-25 did give more detail about impact of the disease on a patient.

There were some factors that did influence the overall answers in the questionnaire. First, the NEI-VFQ-25 was developed from the 51-item NEI-VFQ which assesses the influence of visual disability on HRQOL[15] and has been widely used in chronic eye diseases such as diabetic retinopathy, age-related macular degeneration, glaucoma, cataract and CMV retinitis.[16-17] This instrument mainly focuses on patients who have visual impairment, but patients with BS, such as those in our study, normally have good vision. Since the contraction of the orbiscularis oculi muscle, the cause of BS, interferes with the visual function and thus these patients are less conflicted with serious vision problems than patients with chronic eye diseases which this instrument is usually used for, in our study most subscale scores showed no significant change after treatment, which is different if more serious diseases are being treated and assessed. Another factor is that nine of the 20 patients had previously received multiple injections and, therefore, had experience of the treatment response and might not have noticed any changes after these latest injections, thus leading to only a small change in each subscale. Third, 50% of our study population had seven years or less education,

and it is possible they did not fully understand some questions and thus gave incorrect scores in some places. Finally, the sample size was relatively small, only 20 patients, who additionally were not blinded to the treatment, which may have led to some bias in the responses to the questions.

Conclusion

Our study has demonstrated that the Thai version of the NEI-VFQ-25 is reliable, valid and responsive. It is a very practical, self-rating questionnaire taking only a short period of time. The instrument should be future tested in both local communities and other regions of Thailand.

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