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Validation of a Georgian language headache questionnaire in a population-based sample

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Abstract In a pilot phase of a survey of the prevalence of primary headache disorders in the Republic of Georgia, we validated a Georgian language questionnaire for migraine (MIG), tension-type headache (TTH), MIG+TTH and trigeminal autonomic cephalalgias (TAC). A population-based sample of 186 people with headache completed the questionnaire and were blindly examined by one of two headache experts. The questionnaire diagnoses were: MIG 49, TTH 76, MIG+TTH 45 and TAC 16. The physicians' diagnoses were: MIG 59, TTH 77, MIG+TTH 34, TAC 2 and "symptomatic headache" in 14 subjects.

Sensitivity and specificity for MIG were 0.75 and 0.96, for TTH 0.79 and 0.86, and for MIG+TTH 0.61 and 0.84 respectively. Of 16 TAC diagnoses, the physicians confirmed cluster headache in two patients only. The questionnaire can be utilised to investigate the prevalence of MIG and of TTH. It offers preliminary screening only for TAC, which should be confirmed during a face to face examination.

Keywords Headache • Questionnaire • Migraine • Tension-type headache • Trigeminal autonomic cephalalgias • Validity

Introduction

We present the validation of a headache questionnaire in Georgian language which has been constructed for utilisation in an epidemiological survey of the prevalences of primary headache disorders in the Republic of Georgia.

Recently, the Global Campaign to Reduce the Burden of Headache Worldwide [1] and the Russian Linguistic Subcommittee of the International Headache Society initiated several epidemiological studies of primary headache

disorders in the countries of the former Soviet Union. The aim of these studies is to close the gap in the knowledge of the burden of headache in these countries.

The methodology of the epidemiological survey in Georgia has been established previously [2]. Briefly, we first translated and adapted the diagnostic headache questionnaire of the German Headache Consortium [3] and presented it to several patients. Next, medical residents performed a door-to-door survey presenting the questionnaire to 153 members of consecutive households. All subjects reporting headache

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were subsequently invited for a neurological examination. We found fairly good values for sensitivity and specificity of the questionnaire and obtained plausible estimates of the prevalences of migraine (MIG), tension-type headache (TTH) and chronic headache.

Here we validate the questionnaire by estimating the precision of headache diagnoses made by this instrument in a larger population-based sample of people with headache.

Methods

The study protocol was approved by the Georgian National Council on Bioethics.

Construction of questionnaire

We adapted a questionnaire that had been used and validated for epidemiological headache research in Germany [3]. It was translated from German into the Georgian language by ZK and counterchecked by AD. Both of them are fluent in Georgian and German languages. It had four parts: (a) personal data; (b) a medical enquiry, including questions related to MIG not considering symptoms of migraine aura, TTH, trigeminal autonomic cephalalgias (TAC) and the use of acute and preventative headache medication as well as any other medications; (c) socio-demographic status; and (d) enquiry into willingness to pay (WTP) for acute and preventative headache medication.

The medical enquiry began with a screening question: "Have you had headache last year not related to flu, hangover, cold or head injury?" as recommended by earlier studies [4]. Subjects who responded "yes" to this question were asked to complete the questionnaire. Subjects who responded "no" were asked to respond to the demographic and general medical questions only. Questions relating to MIG, TTH and TAC were based on the

International Classification of Headache Disorders, 2nd edition (ICHD-2) [5]. From the German experience we expected to achieve high sensitivity and specificity for MIG and TTH but to be able only to screen for possible cluster headache [6].

Subjects

The first phase of the epidemiological survey was conducted in two districts of Tbilisi, the Capital of Georgia, occupied by multi-storey apartment buildings with 40–100 households per building. From the survey sample of 700 people, representative of the demographic structure of the entire city population of approximately 1.5 million inhabitants, we drew a random sub-sample of 200 subjects from those who had answered "yes" to the screening question. Three to six months after the questionnaire study the subjects were invited for a free neurological examination, which was performed by one of two headache experienced neurologists (MK or AD), both ignorant of the questionnaire diagnoses.

Statistics

Sensitivity, specificity and positive and negative predictive values were calculated for MIG, TTH and MIG+TTH using physicians' diagnoses as the gold standard. Cohen's kappa with 95% confidence interval (CI) was calculated for the overall agreement between physician and questionnaire diagnoses. Data analysis was performed by SPSS 13.0.

Results

Of the 200 subjects invited to participate, 14 (7%) refused; therefore, the validity of the questionnaire was assessed in 186 subjects. Of these, 132 (71%) were female. Mean age was 45.5±12.4 years.

Table 1 Age and gender distribution among the diagnostic groups

1A Distribution of headache disorders according to the questionnaire						
	Total (N=186)	MIG (N=49)	TTH (N=76)	TAC (N=16)	MIG+TTH (N=45)	
Years: mean (SD)	45.5 (12.4)	38.5 (10.5)	44.8 (13.1)	34.7 (10.1)	40.4 (13.5)	
Gender: m/w	33/153	10/39	13/63	4/12	7/38	
1B Distribution of headache disorders according to physicians						
	Total (N=186)	MIG (N=59)	TTH (N=77)	TAC (N=2)	MIG+TTH (N=34)	Symptomatic headaches* (N=14)
Years: mean (SD)	45.4 (12.4)	36.3 (10.3)	42.9(12.8)	39; 59	42.8 (12.7)	
Gender: m/w	33/153	9/50	15/62	2/0	7/27	

*Details on symptomatic headaches are given in the results section

Validity of all questionnaire diagnoses

The questionnaire diagnosed MIG in 49 subjects, TTH in 76 subjects, MIG+TTH in 45 subjects and TAC in 16 subjects. The physicians diagnosed MIG in 59 cases, TTH in 77 cases, MIG+TTH in 34 subjects and cluster headache in two subjects. The physicians uncovered symptomatic headaches in 14 subjects (7.5%): seven had headache mainly associated with hypertensive crises, which was resolved following the anti-hypertensive treatment, two had post-traumatic headache, one had a brain tumour and four had frontal sinusitis. Tables 1A and 1B show the demographic characteristics and distribution of headache syndromes. Table 2 demonstrates the agreements between questionnaire- and physician-diagnoses. Of the 16 subjects diagnosed with TAC by questionnaire, the physicians confirmed only two. Others were MIG with cluster-like autonomic symptoms. Table 3 summarises the sensitivity, specificity and positive and negative predictive values as well as the corresponding confidence intervals for each diagnosis. The overall Cohen's Kappa coefficient was 0.60 (95%CI: 0.50–0.71).

Discussion

We validated a questionnaire for MIG, TTH and TAC in a population-derived sample of 186 people with headache. We found that values for sensitivity, specificity and positive

and negative prediction were fairly high for MIG and for TTH but lower for the combination of MIG and TTH. The overall agreement between the questionnaire- and physician-diagnoses was 0.60, which should be considered as a “strong” agreement level [7].

On this evaluation, the quality of the questionnaire is comparable with that of the original German-language version [3]. It is also in line with the qualities of others reported in the international literature [8–15]. Sensitivity and specificity are usually higher when an instrument focuses on MIG only. Lipton et al. presented a very short screening questionnaire for MIG, with only three items, and achieved a sensitivity of 0.81 and a specificity of 0.75, with a kappa coefficient of 0.68 [11]. More detailed migraine-specific questionnaires have been presented: the instrument of Kallela et al. obtained a sensitivity of 0.99 and a specificity of 0.96 [16]. Questionnaires for the diagnosis of TTH are rare. Rasmussen presented a questionnaire with a sensitivity of 43% and specificity of 96% [7]. Questionnaires seeking more than one diagnosis have achieved considerably lower agreement levels. Hagen et al. differentiated between migraine, non-migraine headache and chronic headache with Kappa coefficients of 0.59, 0.43 and 0.44 respectively [17]. The questionnaire evaluated by Rasmussen et al. covered migraine and episodic and chronic TTH, with relatively low Kappa coefficients of 0.43, 0.30 and 0.24 respectively [7].

Our results demonstrate that the questionnaire can be used in population-based epidemiological studies to assess

Table 2 Agreement between physician- and questionnaire-diagnoses for the entire study population

		Physician MIG	TTH	TAC	MIG+TTH	Symptomatic headache	Total
Questionnaire	MIG	44	1	0	4	0	49
	TTH	3	61	0	6	6	76
	TAC	5	5	2	3	1	16
	MIG+TTH	7	10	0	21	7	45
	Total	59	77	2	34	14	186

Table 3 Sensitivity, specificity and positive and negative predictive values for each of the diagnoses migraine, tension-type headache and migraine plus tension-type headache

	Sensitivity (95% CI)	Specificity (95% CI)	PPV (95% CI)	NPV (95% CI)
Migraine	0.75 (0.64–0.86)	0.96 (0.92–0.99)	0.89 (0.81–0.98)	0.89 (0.84–0.94)
Tension-type headache	0.79 (0.70–0.88)	0.86 (0.80–0.93)	0.8 (0.71–0.89)	0.85 (0.79–0.92)
Migraine plus tension-type headache	0.62 (0.45–0.78)	0.84 (0.78–0.90)	0.47 (0.32–0.61)	0.91 (0.86–0.96)

PPV, positive predictive value; NPV, negative predictive value; CI, 95% confidence interval

the prevalence of MIG, TTH and, less reliably, the combination of MIG and TTH. It cannot be used to diagnose TAC. Especially MIG patients with cluster-like autonomic symptoms, which are not rare [18] symptoms, were not correctly diagnosed. Future studies will have to show whether it has sufficient sensitivity to be useful as a screening tool for possible TAC cases. The German version had very high sensitivity (100%) but quite low specificity [6], so that all suspected cases must undergo neurological consultation. Several limitations of the study should be mentioned. The neurological examination was done by one of two neurologists, thus excluding the possibility of a cross-validation. We were not able to develop questions appropriate for diagnosis of aura and therefore neglected this aspect completely.

All subjects selected because they reported headache proved to have at least one headache disorder. The specificity of the screening question for headache was therefore 100%. However, we did not include screen-negative participants in the validation study, so cannot determine the sensitivity of the screening question. Previous studies indicate that screen-negative people may have some headache, even MIG [19, 20]. Hence, prevalence figures in the main study will be minimum estimates.

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