Primary headache disorders in the Republic of Georgia

Prevalence and risk factors

Z. Katsarava, MD
A. Dzagnidze, MD
M. Kukava, MD
E. Mirvelashvili, MD
M. Djibuti, MD
M. Janelidze, MD
R. Jensen, MD
L.J. Stovner, MD
T.J. Steiner, MB, PhD
On behalf of *Lifting The Burden*: The Global Campaign to Reduce the Burden of Headache Worldwide and the Russian Linguistic Subcommittee of the International Headache Society

Address correspondence and reprint requests to Dr. Zaza Katsarava, Department of Neurology, University of Essen, Hufelandstrasse 55, 45122 Essen, Germany
zaza.katsarava@uni-essen.de

ABSTRACT

Objective: To estimate the 1-year prevalences of migraine and tension-type headache (TTH), and identify their principal risk factors, in the general population of the Republic of Georgia.

Methods: In a community-based door-to-door survey, 4 medical residents interviewed all biologically unrelated adult members (≥16 years) of 500 adjacent households in Tbilisi, the capital city, and 300 in rural Kakheti in eastern Georgia, using a previously validated questionnaire based on International Headache Society diagnostic criteria.

Results: The target population included 1,145 respondents, 690 (60%) women, mean age 45.4 ± 12.0 years. The 1-year prevalences were as follows: migraine 6.5% (95% confidence interval 5.0–7.9), probable migraine 9.2% (7.5–10.8), all migraine 15.6% (13.5%–17.7%), TTH 10.0% (8.2–11.7), probable TTH 27.3% (24.8–29.9), all TTH 37.3% (34.5%–40.1%). Female gender and low socioeconomic status were risk factors for migraine but not for TTH. Headache on ≥15 days/month was reported by 87 respondents, a prevalence of 7.6% (6.1–9.1). Female gender, low socioeconomic status, and frequent use (≥10 days/month) of acute headache drugs were risk factors. The likely prevalence of medication overuse headache was 0.9% (0.3–1.4), of chronic migraine 1.4% (0.7–2.1), and of chronic TTH 3.3% (2.3–4.4), but caution is needed in interpreting these estimates.

Conclusions: While the prevalences of migraine and tension-type headache are comparable with those in Europe and the United States, a remarkably high percentage of the population of Georgia have headache on ≥15 days/month. This study demonstrates the importance of socioeconomic factors in a developing country and unmasks the unmet needs of people with headache disorders.
***Neurology*® 2009;73:1796–1803**

GLOSSARY

CI = confidence interval; **IHS** = International Headache Society; **MOH** = medication overuse headache; **OR** = odds ratio; **TAC** = trigeminal autonomic cephalgia; **TTH** = tension-type headache.

The common primary headaches, migraine and tension-type headache (TTH), affect up to 80% of general populations.[1] Because of its disabling potential, migraine is acknowledged as one of the most important public health problems of the world.[2] Also of importance from the public health perspective are primary and secondary headache disorders that occur on ≥15 days/month, including chronic migraine, chronic TTH, and medication overuse headache (MOH), all associated at the individual level with a significant burden of illness.

The prevalences of migraine and TTH have been studied many times in Western Europe and North America. Few studies have been carried out in Eastern Europe, and no data are available from the countries of the former Soviet Union.[1] In recognition of the scale of the global burden of headache disorders, 3 major international headache nongovernmental organizations, in collaboration with the WHO, have committed to the initiative "*Lifting The Burden*:

From the Department of Neurology (Z.K.), University of Essen, Germany; Department of Neurology (A.D., M.K., M.J.), Tbilisi Medical University, Georgia; School of Public Health (E.M., M.D.), Tbilisi State Medical University, Georgia; NGO: "Partnership in Research and Action for Health" (M.D.), Tbilisi, Georgia; Danish Headache Center (R.J.), Glostrup University, Copenhagen, Denmark; Norwegian National Headache Centre (L.J.S.), Department of Neuroscience, Norwegian University of Science and Technology, and St. Olav's Hospital, Trondheim, Norway; and Division of Neuroscience and Mental Health (T.J.S.), Imperial College London, London, UK.
Disclosure: Author disclosures are provided at the end of the article.

The Global Campaign to Reduce the Burden of Headache Worldwide." The global campaign aims, in its first stage, to fill the gaps in the knowledge of headache-related burden worldwide.[3]

In this article, we present the results of an epidemiologic survey of migraine, TTH, and MOH in the Republic of Georgia. This Eurasian country in the Caucasus, with a population of 4.4 million,[4] is located on the east coast of the Black Sea and bordered to the north by Russia, to the south by Turkey and Armenia, and to the east by Azerbaijan. Between 1921 and 1991, Georgia belonged to the Soviet Union; it declared independence after the collapse of the Union of Soviet Socialist Republics. Therefore, Georgia has many social and economic similarities with these other mostly European post-Soviet countries.

METHODS The study protocol was approved by the Georgian National Council on Bioethics. All respondents were informed of the purpose of the survey and gave their verbal consent prior to participating.

The survey was carried out in Tbilisi, the capital city with 1.1 million inhabitants, and in a rural area of Kakheti in the eastern part of Georgia, which has 400,000 inhabitants. The methods of the study have been reported previously.[5] Briefly, 4 medical residents, trained in understanding and applying the diagnostic criteria for migraine, TTH, and cluster headache, contacted 500 adjacent households in Tbilisi and 300 in Kakheti. All adult individuals in these households were interviewed using a semi-structured questionnaire. If nobody opened the door, surveyors returned once; if nobody responded for the second time, the next adjacent household was contacted in its place. In cases of refusal, households were categorized as nonresponders and, again, the next household took its place. We differentiated between the target and other members of the household: husband and wife, together with any other biologically unrelated adults, were the target study population, while children, grandparents, aunts, uncles, and other relatives were excluded from the analysis.

We used a questionnaire that had been validated prior to the study. Sensitivity and specificity for migraine were 0.75 and 0.96, for TTH 0.79 and 0.86, and for migraine + TTH 0.61 and 0.84, respectively.[6] To validate questionnaire-derived diagnoses as a within-study control, 35% of respondents who reported headache in the previous year were selected randomly for neurologic interviews and examinations. These were performed by 1 of 2 neurologists (A.D. and M.K.) who were unaware of all questionnaire responses. Both A.D. and M.K. were trained in the field of headache for 2–3 years at the Department for Neurology, University of Essen. They applied International Headache Society (IHS) diagnostic criteria to make their own diagnoses, excluding possible underlying causes when necessary by neurologic examination and brain CT or MRI.

Analysis. The outcome variables of the study were the prevalences of migraine (all IHS criteria met), probable migraine (all but one IHS criteria met, and not fulfilling the IHS criteria for TTH), TTH (all IHS criteria met), probable TTH (all but 1 IHS criteria for TTH met, and not fulfilling the IHS criteria for migraine), and any headache disorder reported as present on ≥15 days/month and not meeting criteria for trigeminal autonomic cephalgias (TACs). Overlap between migraine and TTH on the one hand and headache on ≥15 days/month on the other was possible because the latter included chronic migraine and chronic TTH.

All analyses were processed by SPSS 14.0. Comparisons of interval-scaled variables used *t* test and ordinal-scaled variables used the χ^2 test. Crude prevalences of headache disorders were calculated in percentages, with 95% confidence intervals (CI) estimated as suggested previously.[7]

We used univariate and multivariate logistic regression models to evaluate potential clinical and sociodemographic risk factors for each headache disorder. The following variables were included in the model: age (in years), gender (male vs female), level of education (high vs low), wealth (wealthy and intermediate vs poor), region (city vs rural), duration of headache from onset (in years), and overuse (on ≥10 days/month vs less frequent use) of any acute medication for headache. We calculated crude and multivariable-adjusted odds ratios (OR) and their corresponding 95% CIs.

Table 1 Distribution within the target population of sociodemographic characteristics

Total sample (n = 1,145)	Tbilisi (n = 695)	Kakheti (n = 450)	Census data for population of Georgia according to ref. 4
Gender			
Male	256 (37%)	199 (44%)	47%
Female	439 (63%)	251 (56%)	53%
Age, y	45.7 ± 12.4	44.8 ± 11.2	45.2 ± 11.2
Structure by age, %			
16–19	5.1	2.7	8.3
20–29	18.1	17.9	20.1
30–39	22.8	17.4	16.9
40–49	21.7	28.1	18.3
50–59	16.7	26.9	22.7
60–69	12.3	6.3	10.2
>70	3.3	0.7	3.5
Partnership, n (%)			
Married	503 (72)	387 (86)	
Single	192 (28)	63 (14)	
Education, n (%)			
High (high school or university)	634 (91)	81 (18)	
Low	61 (9)	369 (82)	
Wealth, n (%)			
Wealthy	23 (3.3)	2 (0.4)	
Intermediate	618 (88.9)	275 (61.1)	
Poor	54 (7.8)	173 (38.4)	

RESULTS Altogether, 1,701 subjects in 800 households in Tbilisi and Kakheti were contacted. The household response rates were 92% (462 of 500) in

Tbilisi and 100% (of 300) in Kakheti. The target population comprised 1,145 biologically unrelated people, 695 (61%) from Tbilisi and 450 (39%) from Kakheti. Demographic characteristics of the target population are shown in table 1.

Of the target population, 853 (74.5%) respondents reported headache at least once in the previous year and 659 (57.6%) had headache "not related to flu, hangover, cold, or head injury." Of the latter group, 186 (35%) were seen for the validation study. The sensitivity and specificity of the questionnaire were 0.75 and 0.96 for migraine and 0.79 and 0.86 for TTH.[6]

We found 74 respondents with definite migraine (1-year prevalence 6.5% [95% CI 5.0–7.9]), and a further 105 with probable migraine (9.2% [95% CI 7.5–10.8]). Thus the overall prevalence of migraine plus probable migraine (all-migraine) was 15.6% (95% CI 13.5%–17.7%). Distributions of all-migraine by age and gender are shown in figure 1A. Univariate regression analyses revealed female gender, poor education, poverty, and living in the rural area of Kakheti as risk factors for migraine and all-migraine (table 2). Multivariate regression analysis did not yield significant correlations. The mean frequency of all-migraine was 7.4 ± 6.8 days/month: 31 (17%) respondents reported headache on <1 day/month, 60 (34%) on 1–3 days/month, 66 (37%) on 4–14 days/month, and 22 (12%) on ≥15 days/month. Migraine attacks lasted, on average, 15 ± 13.1 hours.

The vast majority of respondents with migraine or probable migraine had never seen a doctor for it: 8% had done so once and none visited a doctor regularly or received specific medication for migraine. Of the 179 people with all-migraine, 168 (94%) reported taking acute headache drugs: 90 used single analgesics, 71 used analgesic combinations with caffeine, one used a combination with codeine, and the rest relied on herbal-based medications. None had ever used any migraine preventative medication.

We found 114 respondents with TTH (1-year prevalence 10.0% [95% CI 8.2–11.7]), and a further 313 with probable TTH (27.3% [95% CI 24.8–29.9]). The prevalence of TTH plus probable TTH (all-TTH) was estimated to be 37.3% (95% CI 34.5%–40.1%). Distributions of all-TTH by age and gender are shown in figure 1B. Univariate regression analyses revealed female gender but none of the sociodemographic variables as the only risk factor for TTH or probable TTH (table 2). Multivariate regression analysis did not yield any significant correlations. Mean headache frequency was 6.4 ± 6.2 days/month: 72 (17%) respondents reported headache on <1 day/month, 162 (38%) on 1–3 days/month, 149 (35%) on 4–14 days/month, and 44 (10%) on ≥15 days/month. Only 5% of the 427 with all-TTH had seen a doctor for TTH, while 378 (89%) reported use of acute headache medication: 195 took single analgesics and 183 used analgesic combinations with caffeine or codeine. None had preventative medication.

We found 87 respondents who reported headache on ≥15 days/month (1-year prevalence 7.6% [95% CI 6.1–9.1]). Multiple univariate regression analyses revealed female gender, low educational level, poverty, living in the area of Kakheti, and medication overuse as risk factors for headache on ≥15 days/month type (table 3). The multivariate regression model identified female gender (OR 2.3; 95% CI [1.4–4.0]), poverty (OR 3.4; 95% CI [1.7–7.0]), and medication overuse (OR 18.1; 95% CI [6.5–50.6]) as the main risk factors for headache on ≥15 days/month (of any type). Other studied variables were not included in the final model. While frequent headache was more prevalent in the area of Kakheti, the difference in socioeconomic status between people living in Tbilisi and those in Kakheti was a confounding factor. Ten of the 87 with headache on ≥15 days/month met the criteria for probable MOH. It was not possible without intervention and follow-up to identify definite MOH, but these findings nonetheless suggest a prevalence of MOH of 0.9% (95% CI 0.3–1.4). Among the other 77 with headache on ≥15 days/month, 7 met criteria for mi-

Figure 1 Distributions by age and gender of migraine (A) and tension-type headache (B)

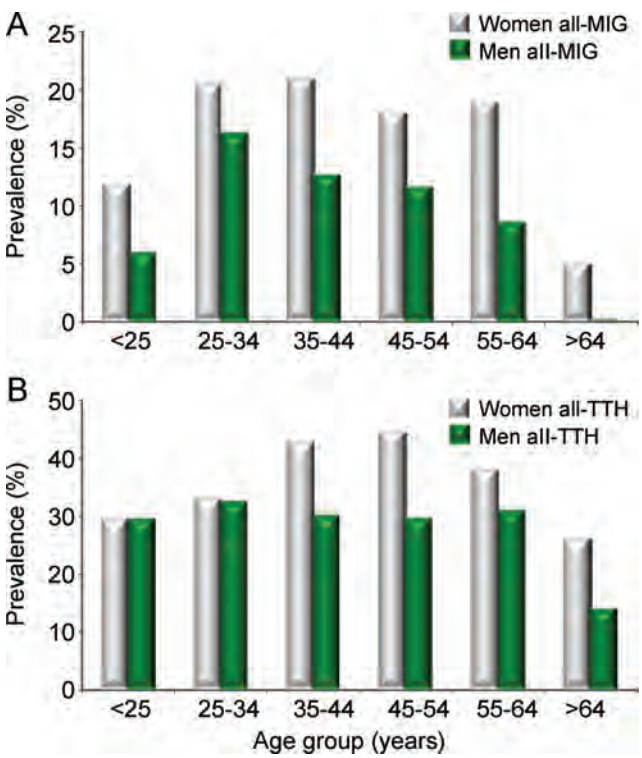


Table 2 Factors associated with migraine and tension-type headache

	Definite migraine, n (%)	Odds ratio (95% CI)	All migraine, n (%)	Odds ratio (95% CI)
Gender				
Male (n = 455)	21 (4.6)	1.0 referent	49 (10.8)	1.0 referent
Female (n = 690)	53 (7.7)	1.7 (1.1–2.9)*	130 (18.8)	1.9 (1.4–2.7)*
Partnership				
Married (n = 890)	60 (6.7)	1.0 referent	136 (15.3)	1.0 referent
Single (n = 255)	14 (5.5)	0.8 (0.4–1.5)	43 (16.9)	1.1 (0.8–1.6)
Education				
High school or university (n = 715)	32 (4.5)	1.0 referent	99 (13.8)	1.0 referent
Low (n = 430)	42 (9.8)	2.3 (1.4–3.7)*	80 (18.6)	1.4 (1.03–1.9)*
Wealth				
Wealthy or intermediate (n = 918)	49 (5.3)	1.0 referent	135 (14.7)	1.0 referent
Poor (n = 227)	25 (11.0)	2.2 (1.3–3.7)*	44 (19.3)	1.4 (1.01–2.0)*
Region				
Tbilisi (n = 695)	28 (4.0)	1.0 referent	92 (13.2)	1.0 referent
Kakheti (n = 450)	46 (10.2)	2.7 (1.7–4.4)*	87 (19.3)	1.6 (1.1–2.2)*
	Definite TTH, n (%)	**Odds ratio (95 CI)**	**All TTH, n (%)**	**Odds ratio (95% CI)**
Gender				
Male (n = 455)	31 (6.8)	1.0 referent	132 (29)	1.0 referent
Female (n = 690)	83 (12)	1.9 (1.2–2.9)*	295 (42.8)	1.8 (1.4–2.4)*
Partnership				
Married (n = 890)	82 (9.2)	1.0 referent	319 (35.8)	1.0 referent
Single (n = 255)	32 (12.5)	1.4 (0.9–2.2)	108 (42.4)	1.3 (0.9–1.7)
Education				
High school or university (n = 715)	76 (10.6)	1.0 referent	252 (35.2)	1.0 referent
Low (n = 430)	38 (8.8)	0.8 (0.5–1.2)	175 (40.7)	1.3 (0.9–1.6)
Wealth				
Wealthy or intermediate (n = 918)	89 (9.7)	1.0 referent	336 (36.6)	1.0 referent
Poor (n = 227)	24 (10.6)	1.1 (0.7–1.8)	87 (38.3)	1.2 (0.9–1.6)
Region				
Tbilisi (n = 695)	78 (11.2)	1.0 referent	243 (35.0)	1.0 referent
Kakheti (n = 450)	36 (8.0)	0.5 (0.5–1.1)	184 (40.9)	1.3 (1.0–1.6)

The table presents the percentages (columns 2 and 4) of the target population having both the disorder and the characteristic (column 1) and the results of multiple univariate regression analyses.
*Significant.
CI = confidence interval; TTH = tension-type headache.

graine and another 15 for probable migraine (total 22: see above) while 27 met criteria for TTH and another 17 for probable TTH (total 44: see above). Of these, 6 respondents described 2 headache types, each type occurring on ≥15 days/month, 1 meeting criteria for probable migraine and the other for probable TTH. This combination is intuitively unlikely. They were counted in the numbers above for all-migraine and all-TTH, as there was no reason to doubt that they had both disorders, but it could not be ascertained whether they had either (or both) chronically. For the analysis of headache on ≥15 days/month, therefore, they were regarded as unclassifiable. We calculated, conservatively, that 16 respondents (22 − 6) had reasonable evidence of chronic migraine (1-year prevalence 1.4% [95% CI: 0.7–2.1]) and 38 similarly for chronic TTH (1-year prevalence 3.3% [95% CI: 2.3–4.4]). In total, 23 were nonclassifiable, mainly because of inconsistent or contradictory responses that offered no rational basis for preferring one diagnosis to another. Very few people with headache on ≥15 days/month had seen a doctor because of it: only 5 had visited a doctor once and none saw a doctor regularly.

Table 3 Factors associated with headache on ≥15 days/month (of any type)

	Headache ≥15 d/mo, n (%)	Odds ratio (95% CI)
Gender		
Male (n = 455)	23 (5.1)	1.0 referent
Female (n = 690)	64 (9.3)	2.2 (1.3–3.8)*
Partnership		
Married (n = 890)	62 (7.0)	1.0 referent
Single (n = 255)	25 (9.8)	1.5 (0.9–2.4)
Education		
High school or university (n = 715)	34 (4.8)	1.0 referent
Low (n = 430)	53 (12.3)	2.8 (1.8–4.4)*
Wealth		
Wealthy or intermediate (n = 918)	51 (5.6)	1.0 referent
Poor (n = 227)	34 (15.0)	3.1 (2.0–5.0)*
Region		
Tbilisi (n = 695)	25 (3.6)	1.0 referent
Kakheti (n = 450)	62 (13.8)	4.3 (2.7–6.9)*
Medication overuse		
No (n = 1,058)	10 (0.9)	1.0 referent
Yes (n = 20)	10 (11.5)	13.6 (5.5–33.7)*

The table presents the percentages (column 2) of the target population having both the disorder and the characteristic (column 1) and the results of multiple regression analyses.
*Significant.

Not all cases are yet accounted for: of the 572 respondents with headache on <15 days/month, the headache type was not classifiable in 102 cases, again mainly because of inconsistent responses. Therefore, the total of nonclassified cases was 125 (19% of all people with headache). Figure 2 provides a summary of the headache types within the target population.

DISCUSSION The 1-year prevalence of overall migraine was 15.6% (definite migraine 6.5% and probable migraine 9.2%), which is comparable with the United States and other European countries.[8-16] This is despite a very high response rate in our study: more usually, response rates vary between 60% and 80%, which can introduce interest bias and lead to artificially high estimates of prevalence rates. Our finding of significant associations between low levels of education and/or wealth and migraine is in line with data from the United States[14] and from at least one[17] but not all European studies.[8,11-13] We suspect the higher prevalence of migraine in Kakheti is explained by the lower socioeconomic level of inhabitants of this region.

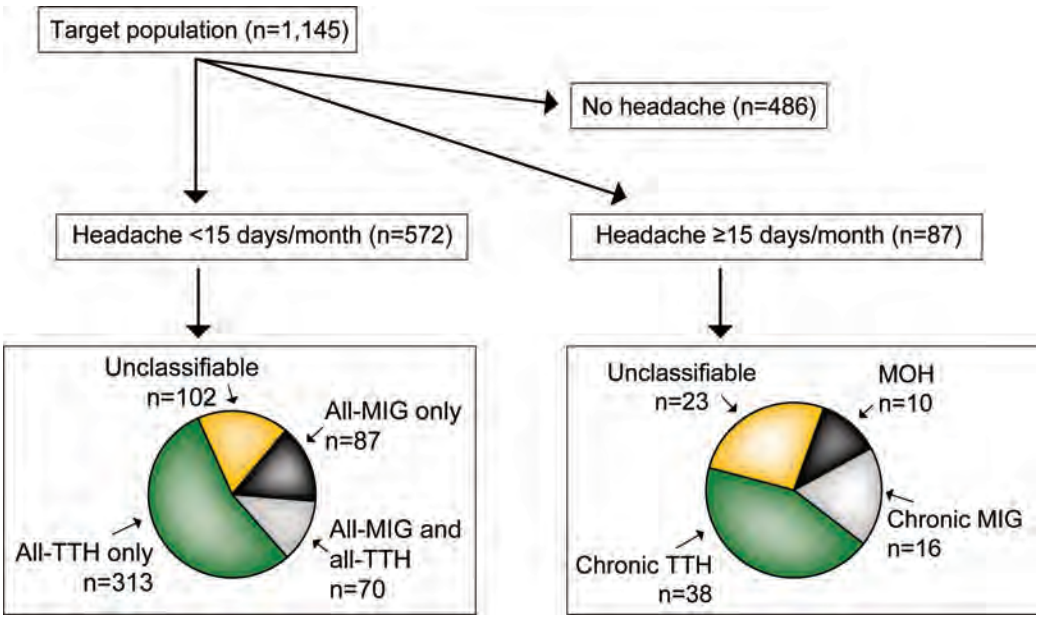
The 1-year prevalence of TTH was 10.0% and of probable TTH 27.3%. If it is assumed that all these were actually TTH (since none met the criteria for definite migraine), the best estimate of the prevalence of TTH was 37.3%. While this is comparable to estimates in Croatia,[18] Germany,[9] and the United States,[19] it is lower than reported in Denmark, but the studies in this country made a point of including infrequent episodic TTH.[15,20] Wide variations in the estimated prevalence of TTH can result from the inclusion or exclusion of cases of infrequent episodic TTH. Questionnaire surveys may not pick up cases when the respondents consider the symptoms trivial. We found, as reported elsewhere,[15] that TTH was more prevalent in females than in males, but it was not associated with any of the sociodemographic factors that we considered.

We need to comment on the 102 cases of headache on <15 days/month that we were unable to classify. The principal problem lay in inconsistent responses, and this is a general characteristic of surveys using questionnaires. These, by their design, limit the opportunity for further questions to probe and clarify. A false-negative rate of anything below 25% is compatible with the sensitivities of our questionnaire for migraine (0.75) and TTH (0.79),[6] and it is implausible that the majority of these 102 were anything other than these 2 disorders. They were not TACs (because of their low frequency), and other primary headache disorders or secondary headaches could not account for so many cases. Because migraine is diagnosed essentially on the presence of specific features, and TTH by the absence of those same features, and also because TTH is more prevalent, we think that these cases were more probably TTH than migraine but would not be justified in adding them to the estimate prevalence for this disorder.

Our most striking finding was the high prevalence of headache on ≥15 days/month: at 7.6%, twice as many as is reported in the United States and Western Europe.[21-25] Our high response rates of ≥92% make it reasonable to presume that this estimate is close to the true prevalence for the populations surveyed, if not for the whole country, which emphasizes this difference between Georgia and the United States and Western Europe.

Some further discussion of these cases is needed. The general population prevalence of chronic all-migraine was estimated to be 1.4%, and of chronic all-TTH 3.3%. We urge caution here. The cases with headache on ≥15 days/month stretched the limits of the questionnaire, as was shown by the 23 cases (26.4%) that could not be classified, including the 6 in which it diagnosed both chronic probable migraine and chronic probable TTH. We can be rather certain that none of these were TACs, since the questionnaire specifically addressed this possibility, but

Figure 2 Distribution of headache types in the target population (n = 1,145)



Respondents with migraine and probable migraine (all-MIG) or TTH and probable TTH (all-TTH) are divided between those with headache on <15 days/month and those with headache on ≥15 days/month (chronic MIG or chronic TTH). All-migraine only (87) plus all-migraine and all-TTH (70) plus chronic migraine (16) plus 6 with unclassifiable headache ≥15 days/month result in 179 total migraine, of which 74 had definite migraine and 105 probable migraine as reported in Results. All-TTH only (313) plus all-migraine and all-TTH (70) plus chronic TTH (38) plus 6 with unclassifiable headache ≥15 days/month result in 427 total TTH, of which 114 had definite TTH and 313 probable TTH (see Results). In addition, 125 respondents could not be reliably classified. Six of these, with headache on ≥15 days/month, met criteria for both migraine and TTH; they were counted in the totals for migraine (179) and TTH (427) but not in the totals for chronic migraine or chronic TTH as it could not be ascertained which of the 2 disorders was chronic (see text). MIG = migraine; TTH = tension-type headache; MOH = medication overuse headache.

hesitate to go further. The validation study showed that both sensitivity and specificity for each of migraine and TTH fell in respondents with multiple headache types. This was one factor creating uncertainty. Another much more important factor is that reliable differentiation among chronic migraine, chronic TTH, MOH, and other headache types occurring on ≥15 days/month generally calls for prospective diary-based follow-up. Therefore, we draw 3 conclusions: 1) that headache on ≥15 days/month (of whatever type) is unusually prevalent in Georgia; 2) that this must be a heavy burden within the population; and 3) that studies to characterize it further are a high priority in this country.

The following risk factors were identified for headache on ≥15 days/month: female gender, poverty, and frequent use of acute headache medication. All have been reported in other studies in the international literature. In particular, a strong association between frequent headache and overuse of acute headache drugs has been demonstrated in almost all epidemiologic studies throughout the world that have looked at this.[21-23,26-28] Our finding that MOH might be present in about 0.9% of adults was somewhat lower than estimates elsewhere,[21,22,24-28] but only 11% (10 of 87) of people with headache on ≥15 days/month appeared to be overusing acute headache drugs. Very few people in Georgia are covered by health insurance and therefore all medical costs, including those of drugs, must be met personally. This is likely to be an important limiting factor for drug overuse in a relatively poor country. But the unusually high prevalence of headache on ≥15 days/month in conjunction with rates of medication overuse no greater than elsewhere is particularly interesting because it indicates that medication overuse is far from being the only causal factor.

More important in Georgia is the association of headache on ≥15 days/month with low socioeconomic status, which has changed dramatically during the last 20 years. In the Soviet era, the State guaranteed the necessary minimum of wealth and basic health care services were provided with no out-of-pocket copayments. Transition from this socialist system to a market economy has been accompanied by a marked socioeconomic decline for many inhabitants, and the development of significant disparities. Given the strength of the observed association, the high prevalence in Georgia of headache on ≥15 days/month may reflect these changes. Unfortu-

nately, no epidemiologic studies of primary or secondary headaches were conducted in the past, which might have provided a unique possibility to investigate the influence of socioeconomic change on the prevalence of chronic or other headache disorders. Another possible reason for the high prevalence of frequent headache is the lack of adequate medical services in Georgia for people with headache. Alongside this, most people in Georgia are ill-informed about the efficacy of treatments for primary headache disorders such as migraine or TTH. If either of these is relevant, it implies that good health care is a factor in preventing progression from episodic to chronic headache, which may be true but it has not been shown elsewhere.

The strengths of the study are several. There were high response rates of 92% and 100%. Second, the collection of data by medical residents during face-to-face evaluations raised the quality of data. Third, face-to-face reexaminations by experienced neurologists of 35% of respondents with headache were able to confirm the vast majority of the diagnoses made by questionnaire. We also acknowledge the limitations of the study. The questionnaire struggled with many cases of headache on ≥15 days/month: this has been discussed in depth already. The survey, while community-based, was carried out in one urban (the capital city) and one rural region. We might have surveyed more regions had it not been for resource limitations, although whether this would have been a worthwhile investment (in terms of learning more, and set against other priorities) is uncertain. Although the Republic of Georgia has many similarities to other post-Soviet countries, ethnic and cultural differences exist between them. Therefore, the findings in Georgia cannot without considerable caution be extrapolated to these countries. Further investment would, we believe, be far more profitably made in epidemiologic studies elsewhere in the former Union of Soviet Socialist Republics.

DISCLOSURE

Dr. Katsarava, Dr. Dzagnidze, Dr. Kukava, Dr. Mirvelashvili, Dr. Djibuti, and Dr. Marina report no disclosures. Dr. Jensen serves as Co-Editor of the *Journal of Headache and Pain*. Dr. Stovner serves on scientific advisory boards for BTG International Ltd and Minster Pharmaceuticals plc; serves as an Associate Editor of the *Journal of Headache and Pain* and on the editorial advisory board for the *Journal of the Norwegian Medical Association*; and has received research support, speaker honoraria, and travel expenses from GlaxoSmithKline, Pfizer Inc., AstraZeneca, Allergan, Inc., Nycomed, Desitin Pharmaceuticals GmbH, and Merck Serono. Dr. Steiner has received honoraria and/or travel reimbursement from World Headache Alliance, International Headache Society, European Headache Federation, British Association for the Study of Headache, University La Sapienza, Merck Inc., GlaxoSmithKline, MAP Pharmaceuticals, Inc., Mundipharma International Limited, and Bayer Healthcare AG; serves as consultant to Datamonitor and Bayer Healthcare AG; serves on the editorial advisory boards of the *Journal of Headache and Pain* and *Research Ethics Review*; and receives research support from the World Headache Alliance, the International Headache Society, and the European Headache Federation.

Received March 15, 2009. Accepted in final form August 24, 2009.

REFERENCES

1. Stovner L, Hagen K, Jensen R, et al. The global burden of headache: a documentation of headache prevalence and disability worldwide. Cephalalgia 2007;27:193–210.
2. WHO. The World Health Report. Geneva: WHO; 2001.
3. Steiner T, Alliance. WH. Lifting the burden: the global campaign against headache. Lancet Neurol 2004;4:204–205.
4. Statistic Yearbook of Georgia. Department of Statistics, Tbilisi; 2005.
5. Katsarava Z, Kukava M, Mirvelashvili E, et al. A pilot methodological validation study for a population-based survey of the prevalences of migraine, tension-type headache and chronic daily headache in the country of Georgia. J Headache Pain 2007;8:77–82.
6. Kukava M, Dzagnidze A, Janelidze M, et al. Validation of a Georgian language headache questionnaire in a population-based sample. J Headache Pain 2007;8:321–324.
7. Bortz J. Statistik für Human- und Sozialwissenschaftler: 6: Aufl. ed. Heidelberg: Springer Verlag; 2005.
8. Dahlof C, Linde M. One-year prevalence of migraine in Sweden: a population-based study in adults. Cephalalgia 2001;21:664–671.
9. Gobel H, Petersen-Braun M, Soyka D. The epidemiology of headache in Germany: a nationwide survey of a representative sample on the basis of the headache classification of the International Headache Society. Cephalalgia 1994;14:97–106.
10. Hagen K, Zwart JA, Vatten L, Stovner LJ, Bovim G. Prevalence of migraine and non-migrainous headache–head-HUNT, a large population-based study. Cephalalgia 2000;20:900–906.
11. Henry P, Auray JP, Gaudin AF, et al. Prevalence and clinical characteristics of migraine in France. Neurology 2002;59:232–237.
12. Lampl C, Buzath A, Baumhackl U, Klingler D. One-year prevalence of migraine in Austria: a nation-wide survey. Cephalalgia 2003;23:280–286.
13. Lanteri-Minet M, Valade D, Geraud G, Chautard MH, Lucas C. Migraine and probable migraine: results of FRAMIG 3, a French nationwide survey carried out according to the 2004 IHS classification. Cephalalgia 2005;25:1146–1158.
14. Lipton RB, Bigal ME, Diamond M, Freitag F, Reed ML, Stewart WF. Migraine prevalence, disease burden, and the need for preventive therapy. Neurology 2007;68:343–349.
15. Rasmussen BK, Jensen R, Schroll M, Olesen J. Epidemiology of headache in a general population–a prevalence study. J Clin Epidemiol 1991;44:1147–1157.
16. Stewart WF, Lipton RB, Celentano DD, Reed ML. Prevalence of migraine headache in the United States. Relation to age, income, race, and other sociodemographic factors JAMA 1992;267:64–69.
17. Hagen K, Vatten L, Stovner LJ, Zwart JA, Krokstad S, Bovim G. Low socio-economic status is associated with

increased risk of frequent headache: a prospective study of 22718 adults in Norway. Cephalalgia 2002;22:672–679.
18. Zivadinov R, Willheim K, Sepic-Grahovac D, et al. Migraine and tension-type headache in Croatia: a population-based survey of precipitating factors. Cephalalgia 2003;23:336–343.
19. Schwartz BS, Stewart WF, Simon D, Lipton RB. Epidemiology of tension-type headache. JAMA 1998;279:381–383.
20. Lyngberg AC, Rasmussen BK, Jorgensen T, Jensen R. Has the prevalence of migraine and tension-type headache changed over a 12-year period? A Danish population survey. Eur J Epidemiol 2005;20:243–249.
21. Castillo J, Munoz P, Guitera V, Pascual J. Epidemiology of chronic daily headache in the general population. Headache 1999;39:190–196.
22. Colas R, Munoz P, Temprano R, Gomez C, Pascual J. Chronic daily headache with analgesic overuse: epidemiology and impact on quality of life. Neurology 2004;62:1338–1342.
23. Lanteri-Minet M, Auray JP, El Hasnaoui A, et al. Prevalence and description of chronic daily headache in the general population in France. Pain 2003;102:143–149.
24. Lucas C, Auray JP, Gaudin AF, et al. Use and misuse of triptans in France: data from the GRIM2000 population survey. Cephalalgia 2004;24:197–205.
25. Scher AI, Stewart WF, Liberman J, Lipton RB. Prevalence of frequent headache in a population sample. Headache 1998;38:497–506.
26. Lu SR, Fuh JL, Chen WT, Juang KD, Wang SJ. Chronic daily headache in Taipei, Taiwan: prevalence, follow-up and outcome predictors Cephalalgia 2001;21:980–986.
27. Wang SJ, Fuh JL, Lu SR, et al. Chronic daily headache in Chinese elderly: prevalence, risk factors, and biannual follow-up. Neurology 2000;54:314–319.
28. Zwart JA, Dyb G, Hagen K, Svebak S, Holmen J. Analgesic use: a predictor of chronic pain and medication overuse headache: the Head-HUNT Study. Neurology 2003;61:160–164.