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Familial occurrence of headache disorders: A population-based study in mainland China

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ABSTRACT

Background: Headache disorders are highly prevalent worldwide, and familial occurrence and heredity are contributory factors attracting the interest of epidemiological researchers. Our purpose, in a large sample drawn nationwide from the Chinese general population, was to evaluate the frequency of similar headache in first-degree relatives (FDRs) of those with different headache types.
Methods: This was a questionnaire-based nationwide cross-sectional door-to-door survey using cluster random-sampling, selecting one adult (18–65 years) per household. Headache was diagnosed by ICHD-II criteria. Participants with headache were asked whether or not any FDRs had similar headache to their own. Chi-squared test and multivariate logistic regression analysis were used to assess the strength and significance of associations.
Results: Of 5041 survey participants (participation rate 94.1%), 1060 (21.0%) were diagnosed with headache (migraine 469 [9.3%], tension-type headache [TTH] 543 [10.8%], headache on ≥15 days/month 48 [0.95%]). From these, 31 were excluded because of missing data about FDRs, leaving 1029 for analysis (male 350 [mean age: 46.7 ± 11.4 years]; female 679 [mean age 46.3 ± 11.2 years]). Similar headache in one or more FDRs was reported by 22.2% (95% CI: 19.6–24.7%) overall, by 25.1% (21.1–29.1%) of those with migraine, by 19.1% (15.7–22.4%) with TTH and by 29.2% (16.3–42.0%) with headache on ≥15 days/month. The differences was significant between migraine and TTH (OR = 1.4, p = 0.023), but were not significant between headache on ≥15 days/month and TTH (OR = 1.7, p = 0.093), migraine and headache on ≥15 days/month (OR = 1.2,p = 0.534). In multivariate analysis: for migraine *versus* TTH,AOR = 1.2 (p = 0.015); for headache on ≥15 days/month *versus* TTH, AOR 2.3 (p = 0.018).
Conclusion: Headache was highly prevalent in China and common among FDRs of those with any type of headache (headache on ≥15 days/month > migraine > TTH). Against the background of the general-population prevalence of each disorder, familial occurrence was a very highly influential factor in headache on ≥15 days/month. There are important implications in this for public health and education.

1. Background

Many studies in recent years by validated questionnaire have further verified that headache disorders are highly prevalent worldwide [1]. Headache in China is in lack of healthcare utilization [2]. Differences in headache classification, perception of headache severity and health-seeking behaviour between Chinese and non-Chinese had been found in Singapore [3]. Familial occurrence,

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whether as a consequence of heredity or of common lifestyles, behaviours and environment, is a contributory factor which attracts the interest of epidemiological researchers. Studies suggest a high risk of migraine in first-degree relatives (FDRs) of those with migraine [4,5], and perhaps especially of migraine with aura (MA) in the FDRs of MA probands [6,7]. One study found that FDRs of probands with migraine without aura (MO) had increased risks of MO and MA, while FDRs of those with MA had increased risk of MA but not of MO [8]; another study suggested that FDRs of MA and MO probands had significantly increased risks of both MA and MO [9]. Early onset and severe migraine may be associated with higher levels of familial occurrence [10].Studies also suggest that FDRs of those with chronic tension-type headache (CTTH) have significantly increased risk of themselves having CTTH [11–13]. Currently there are no reports of familial occurrence of episodic TTH, or of the group of disorders characterised by headache on ≥15 days/month (which include CTTH and medication-overuse headache [MOH]). No studies have been conducted among the population of China.

In the context of a cross-sectional population-based nationwide survey of headache prevalence [14], we collected data on similar headache affecting FDRs of those with migraine, TTH and headache on ≥15 days/month. Here we present the analysis of these data.

2. Methods

2.1. Ethics

The study protocol was approved by the Chinese Ministry of Health and the ethics committee of the Chinese PLA General Hospital, Beijing.

2.2. Study design

The original study performed during 2009–2010 was a cross-sectional door-to-door survey throughout China. A representative sample of the adult population was obtained by randomised cluster-sampling according to the EPI method established by the World Health Organization [15]. Households were visited by cold-calling, and one adult was randomly selected from each. These methods have been described in detail previously [14,16].

2.3. Enquiry

Interviewers employed a structured questionnaire developed for population-based studies [1] by *Lifting The Burden* [17], translated into Chinese from the English version and validated within the target population in a sub-study [16]. Demographic enquiry included age, gender, habitation, marital status, occupation and educational level. Anthropometric data included weight and height, recorded using a portable calibrated digital scale, from which body mass index (BMI) was calculated. Headache diagnoses were based on the criteria of the International Classification of Headache Disorders 2nd edition (ICHD-II) [18]. Participants identifying more than one headache type were asked to focus only on the one they recognised as most bothersome.

Of those with headache, we asked whether or not any FDRs (parents, siblings or children) had similar headache to their own. We assumed such headache was diagnostically the same as that described by the respondent.

2.4. Statistical analysis

We categorised demographic variables and summarised them as percentages by headache type. Age was also expressed as means ± standard deviations (SDs). The occurrence of similar headache in FDRs was recorded as "yes" or "no" and proportions

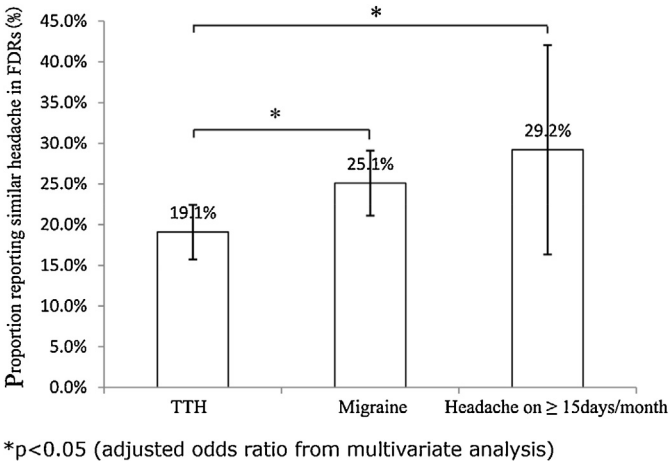

Fig. 1. Proportions of participants reporting similar headache in first-degree relatives according to headache type.

estimated with 95% confidence intervals (CIs). We used independent chi-squared tests for significant differences between headache types, regarding $p \leq 0.05$ as significant. We then calculated adjusted odds ratios (AORs) with 95% CIs by multivariate logistic regression taking into account the following variables: age, gender, habitation, marital status, occupation, educational level, body weight.

3. Results

There were 5,041 survey participants (participation rate 94.1%), of whom 469 (9.3%) were diagnosed with migraine, 543 (10.8%) with TTH and 48 (0.95%) with headache on ≥15 days/month. We excluded 18 with migraine and 13 with TTH because of missing data about FDRs; therefore we analysed 1029 participants reporting headache (mean age: 46.5 ± 11.3 years; male 350 [46.7 ± 11.4 years]; female 679 [46.3 ± 11.2 years]; 451 with migraine, 530 with TTH and all 48 with headache on ≥15 days/month). Table 1 shows the distribution of demographic, BMI data.

Overall, 22.2% (95% CI: 19.6–24.7%) of participants with headache reported similar headache in FDRs: 25.1% (21.1–29.1%) of those with migraine, 19.1% (15.7–22.4%) with TTH and 29.2% (16.3–42.0%) with headache on ≥15 days/month (Fig. 1). These proportions were significantly higher in migraine (chi-squared = 5.141, OR = 1.4,p = 0.023; AOR = 1.2, p = 0.015) and headache on ≥15 days/month (chi-squared = 2.823, OR = 1.7, p = 0.093; AOR = 2.3, p = 0.018) than in TTH, but the difference between headache on ≥15 days/month and migraine was not significant (chi-squared = 0.386, OR = 1.2, p = 0.534; AOR = 1.2, p = 0.237).

We calculated ratios of the proportions reporting similar headache in FDRs to the observed general-population 1-year prevalence of each headache type (migraine 9.3%, TTH 10.8%, CDH 1.0%) [14,19]. These were for migraine 2.7:1, for TTH 1.8:1 and for headache on ≥15 days/month 30.7:1.

4. Discussion

Our study found high proportions (19.1–29.2%) of FDRs of participants with headache were reported as having similar headache. They were significantly higher in both migraine and headache on ≥15 days/month than in TTH. However, when related to the general-population prevalence of each headache type, the proportion for headache on ≥15 days/month was an order of magnitude higher than those for migraine or TTH. It is essential to recognise here that these proportions do not represent prevalences because