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Clinical Study

Prevalence and burden of headache disorders in two neighboring provinces of China

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ABSTRACT

To our knowledge, studies concerning the prevalence and burden of primary headache in China are limited to specific regions without comparison of different districts. A survey in a different area with similar climate and culture may enhance our knowledge of the factors causing primary headache and the burden of headache. We conducted a 1 year survey on the prevalence and burden of primary headache in the Chinese provinces of Guangdong and Guangxi. Our study also evaluated the factors behind similarities and differences affecting prevalence in the two regions of study. The survey methodology, which was used in an Expanded Program on Immunization by the World Health Organization, was adopted to investigate the prevalence and burden of headache patients. Random samples of 372 local residents in Guangdong and 182 local residents in Guangxi aged 18–65 years were invited to a face-to-face interview. The education level and mean household income were higher in Guangdong ($p < 0.05$). The 1 year prevalence of primary headache was 22.6% (84/372) in Guangdong and 41.2% (75/182) in Guangxi ($p < 0.001$). The average financial burden of primary headache is 2.1% and 3.7% of the mean household income in Guangdong and Guangxi, respectively ($p = 0.001$). The district with lower economic status had a higher prevalence of primary headache, and inevitably bears a heavier burden even with the same disease cost.

1. Introduction

Primary headache disorders are a significant, largely unaddressed health burden worldwide [1]. According to the existing data, primary headache disorders have a lifetime prevalence of 66% [2]. Headache prevalence estimates may be influenced by age, sex, race, geography and socioeconomic status. Thus, studies reporting headache prevalence may vary depending upon the population that is being evaluated [3]. Severe and frequent headache limits daily activities, decreases quality of life and can create a huge burden on individuals, their family and society [4,5]. Social, financial and cultural factors can all influence the experience of the individual headache sufferer, and these factors could presumably be exacerbated in patients in resource-poor settings.

Most prior surveys were largely confined to one area of China and lacked any comparative study between different regions, limiting our understanding of the factors affecting headache burden and treatment cost. Comparative studies between different regions with similar geographic and human factors can help improve our understanding of the factors affecting headache burden and cost. This study aimed to identify the 1 year prevalence and burden of primary headache (including migraine, tension type headache [TTH] and chronic daily headache) in two neighboring provinces of the same latitude, namely Guangdong and Guangxi. We also studied the utilization rate of medical resources, treatment cost for headache sufferers and the factors affecting headache financial burden.

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2. Subjects and methods

Guangdong and Guangxi are located in the south of China near the Tropic of Cancer and are adjacent. The two regions have a similar environment and climate, and most residents use the same local language and share an identical culture and similar eating habits (Table 1). We undertook a randomized sample of 570 people aged 18–65 years drawn from Guangdong and Guangxi. Ten local neurologists were appointed to take charge of the face-to-face interview and investigation. Data were collected using a standardized questionnaire from June to August 2009.

2.1. Sampling

The survey methodology, which was used in an Expanded Program on Immunization (EPI) by the World Health Organization (WHO), was adopted to investigate the prevalence and burden of headache in Guangdong and Guangxi [6].

A randomly selected sample was taken from cities (urban) and counties (rural). According to similar 2004 national census data, Foshan and Zhongshan cities were selected to be the survey sites in Guangdong, and Nanning City was chosen in Guangxi. In total, two counties in Foshan, eight counties in Zhongshan, and four counties in Nanning were selected. These included a total of 54 survey sites in Foshan and Zhongshan, and 26 survey sites in Nanning. The sample size was seven households (minimum of two people per household) for each survey site. At each survey site, the investigators used the minutes past the hour on reaching the selected investigation sites to determine the direction of travel (0–14 minutes = north, 15–29 = east, 30–44 = south, and 45–59 = west). For example, if the investigators arrived at 09:13, they went north for investigation, and if they arrived at 08:50, they travelled west. The investigation was carried out by interviewing the first family found at a specific location along the directional route. The investigators continued along that direction until the required sample size was obtained. If the survey point was a multistory building, the floor they investigated was the minutes past the hour they arrived in front of the building, divided by the number of floors, plus 1.

In each household, the investigator listed all family members aged from 18 to 65 years, and then one person was randomly drawn to participate in the investigation. If the respondent was not at home, another household within the residential area forming part of the sample site was interviewed to ensure the required sample size. If an alternative household could not be selected because of a limited number of dwelling places, the investigators surveyed the empty household by telephone at another time.

2.2. Questionnaire

A structured questionnaire was translated into Chinese from the English version developed by the Lifting The Burden campaign for population-based studies and validated within the target population [7]. Its diagnostic accuracy and reliability were excellent for migraine and adequate for TTH, which lacks specific diagnostic features. The questionnaire had three parts: (1) personal and sociodemographic data, (2) diagnostic questions, and (3) inquiry into headache-related burden.

Further diagnostic questions were based on International Classification of Headache Disorders, Second Edition criteria [8] and aimed to identify migraine and TTH. Respondents who might have more than one type of headache were instructed to focus on the subjectively most bothersome type, so that only one headache type was diagnosed, [7] and trigeminal autonomic cephalalgias and secondary headaches were neglected.

To arrive at a diagnosis from these responses, criteria were applied first for migraine, then for TTH, for probable migraine, and finally for probable TTH. Two neurologists reviewed the data, and a third expert was brought in to resolve any disagreements in diagnosis. When the three neurologists could not reach a consensus, the case was marked as unclassifiable.

In calculating the prevalence of migraine, we combined patients with definite and probable migraine, as we did in the validation study [7] where the rationale is explained in detail. Similarly for TTH, we combined patients with definite and probable TTH.

2.3. Statistical analysis

Statistical analysis was performed with SAS statistical software, version 9.1.3 (SAS Institute, Cary, NC, USA). The demographic and headache characteristics of all the patients were summarized using frequency tables and descriptive statistics (mean ± standard deviation) for quantitative measurements. A chi-squared test was performed to compare the demographic data from each region. Demographic data were compared between the Guangdong and Guangxi groups with the chi-squared test for category disorder variables and with the Mann–Whitney rank sum test for ordered variables.

Multiple logistic regression was used to estimate the odds ratios for association between headache prevalence and demographic data (age, sex, body mass index [BMI], education, marital status, race, household income) with non-headache groups as the reference categories. All statistical tests involved two tailed tests, where $p < 0.05$ was considered statistically significant.

2.4. Ethical approval

The study protocol was reviewed and approved by the local Ethics Committee in both regions. Each patient signed an informed consent form before they participated in the study.

3. Results

A total of 570 local residents (380 from Guangdong province and 190 from Guangxi province) participated in the study. A total of 554 fully completed questionnaires (372 from Guangdong and 182 from Guangxi) were used in our statistical analyses, after 16 questionnaires were excluded because of missing data (eight from Guangdong and eight from Guangxi).

3.1. Sociodemographic characteristics

The age, sex, race, BMI, marriage, education level and annual household income were compared between the two provinces (Tables 2 and 3). Guangdong participants received more years of

Table 1
Geographic location and climatic conditions of Guangdong and Guangxi provinces in China

Region	Longitude (E)	Latitude (N)	Altitude (meters)	Average annual temperature (°C)	Average annual rainfall (mm)	Annual sunshine duration (hours)
Guangdong	109°45′–117°20′	20°12′–25°31′	100–400	18.0–23.2	1500–2500	1500–2300
Guangxi	104°26′–112°04′	20°54′–26°24′	74–79	16.5–23.1	1500–1800	1169–2219

E = east, N = north.