Epidemiological survey of primary palmar hyperhidrosis in adolescent in Fuzhou of People’s Republic of China

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Abstract

Objective: To investigate the prevalence and epidemiological characteristics of primary palmar hyperhidrosis (PPH) among adolescents in Fuzhou City of PR China. Methods: Stratified cluster sampling was carried out and a cross-sectional epidemiological survey by questionnaire was applied among 13,000 college and high school students. Results: The prevalence rate of PPH was 4.59% affecting both sexes equally. The peak age of onset is 6—16 years, accounting for 95.6% of the PPH population. Positive family history was found in 15.3% PPH cases. Besides palms, axillae and soles can be also affected. Conclusions: PPH affects a larger group of individuals than previously reported. More measures should be taken to enhance the recognition, diagnosis, and treatment of PPH.

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Keywords: Hyperhidrosis; Prevalence; Epidemiological survey

1. Introduction

Primary palmar hyperhidrosis (PPH) is a condition marked by excessive palmar perspiration beyond physiological need. Patients sweat in response to thermal and emotional stimuli but also spontaneously without apparent trigger [1]. The true etiology of PPH remains unknown. It is suggested to result from overactivity of sympathetic nervous system. The degree of sweating is variable, ranging from moderate moisture to severe dripping. Patients with PPH experience substantial functional and emotional problems, including limitation in work, social interaction, and physical activity, as well as psychological distress. Despite recent advances in recognition and treatment of PPH [2], the epidemiological survey has hardly been conducted [3]. Most literature cited prevalence of PPH by estimation. In order to document prevalence and distribution of PPH in Fuzhou area of PR China, we performed a cross-sectional study on adolescents aged between 15 and 22 years from September to December in 2004, using the cluster sampling method.

2. Methods

2.1. Subjects

In this study, stratified cluster sampling was adopted to survey adolescents aged between 15 and 22 years in Fuzhou City. Based on estimated prevalence rate of PPH in the population being about 1.0% with an allowed error of 20%, we calculated that minimum of 9508 persons were needed for this study. Ten high schools and three colleges were randomly cluster sampled from 42 high schools and 12 colleges in Fuzhou City. A total of 13,000 students were included in this study.

2.2. Basic information

A total of 13,000 students were surveyed, with 12,803 completing the necessary components for the estimate. The response rate obtained was 98.48%. The main reason for no response was absence on the day of survey. Among responders, 9087 (71%) were students from high schools and 3716 (29%) from colleges; of the total, 7104 (55.5%) were schoolboys while 5699 (44.5%) were schoolgirls. All of them were of the age group of 15—22 years, with the average 17.26 ± 1.88 years.
2.3. Screening methods

2.3.1. Questionnaire

The self-questionnaire was designed by our department. Items of questionnaire included current age, sex, severity of excessive sweat, age of onset, location, time of occurrence, precipitating factors, associated symptoms, psychosocial effect, past history, and family history. The severity is scaled as 0—3 degrees. Zero degree indicates no excessive sweat. Degree 1—3 is corresponded to the results of Lai et al.[4] (Table 1). Degree 2 or 3 was identified as hyperhidrosis.

2.3.2. Step one

First, the teachers involved were trained by investigators at seminars, then the questionnaires were handed out to students, and the students were asked to complete it in school. The questionnaires were collected, the respondent with excessive sweat or self-evaluated point ≥5 entered the second step for further assessment.

2.3.3. Step two

Two doctors of neurology or dermatology department, trained in unison, had face-to-face interview with each student at step two, made the cutoff between scale 1, scale 2, scale 3, and gave clinical diagnosis by the recommended standard[2] after excluding secondary cause of excessive sweating. Kappa values calculated for intra-observation were all more than 0.86.

2.4. Statistics

All data were input into EPIDATA 3.02 and analyzed with SPSS FOR WINDOW 11.5 statistics program. Differences were considered significant at a probability level of $P < 0.05$.

Table 1 Severity scale of PPH

<table>
<thead>
<tr>
<th>Degree</th>
<th>Severity</th>
<th>Content</th>
<th>Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>None</td>
<td>No excessive sweat</td>
<td>0—3</td>
</tr>
<tr>
<td>1</td>
<td>Mild</td>
<td>Palms were frequently moist</td>
<td>4—5</td>
</tr>
<tr>
<td>2</td>
<td>Moderate</td>
<td>Palmar sweat was profuse enough to drench a handkerchief</td>
<td>6—8</td>
</tr>
<tr>
<td>3</td>
<td>Severe</td>
<td>Palmar sweat was spontaneously dripping similar to faucet leak when the patient made a fist</td>
<td>9—10</td>
</tr>
</tbody>
</table>

Self-evaluated point (#).

3. Results

3.1. Epidemiological characteristics of PPH

3.1.1. Prevalence

The prevalence of PPH in the survey sample was 4.59% (Table 2). No significant difference in prevalence was found between male and female ($\chi^2 = 0.49$, $P > 0.05$), whereas prevalence in high school group was slightly higher than college group ($\chi^2 = 4.45$, $P < 0.05$). In all 588 cases of PPH, 552 cases (93.87%) were classified as degree 2 in severity scale and 36 cases (6.12%) as degree 3. Positive family history was found in 90 cases (15.3%).

3.1.2. Age of onset

In the cohort of study, the age of onset ranged from 4 to 22 years. No significant difference was found between different school group and sex group. The peak age of onset was 6—16 years, accounting for 95.6% PPH population.

3.1.3. Anatomic location of excessive sweating

Besides palms, other anatomic area can be affected in PPH population. Table 3 illustrates that soles and axillae can be also affected.

4. Discussion

The questionnaire used in this investigation had been designed in detail to meet the demand for screening of PPH patients. The respondent came from a stratified cluster sample with high response rate. The investigators were trained, and each case was checked twice by neurologist and dermatologist before a diagnosis was made. Therefore, the result of the survey has certain credibility.

The result shows the prevalence of PPH among adolescents in Fuzhou area is 4.59%, affecting both sexes equally. This prevalence rate is higher than that reported by Strutton et al. [3], who investigated all age groups in USA. This different rate may be due to different age range of...
respondents, diagnostic criteria, different investigating method, and geographic disparity. It is suggested [5] that the prevalence of PPH is higher among teenage and young adults of Southeast Asia population. Our survey supports this point of view. The age of onset of the PPH in this survey ranges from 4 to 22 years, with the peak age being 6–16 years. It shows the trend of high prevalence in this age group. Clinical evaluation [1,5] also shows that excessive sweating often begins in childhood; the frequency and intensity of PPH symptom decreases slowly with age. The intensity of symptoms usually decreases somewhat at the 40-year-old stage. The reason underlying such alleviation is not clear at this point which may need further investigation.

In our study, excessive sweating is confined mainly to the palms, soles, and axillae. One explanation is the presence of dense eccrine sweat glands in these areas. Another reason has been speculated that the hypothalamic sweat center controlling the palms and soles (and the axillae in some patients) is distinct from the rest of the hypothalamic sweat centers and is under the exclusive control of the cerebral cortex without input from the thermosensitive elements [6]. Thus, excessive sweating of PPH patients is usually induced by anxiety, embarrassment, fear, anger, and excitement of mental stress [7]. These precipitating factors are coincident to clinical note in PPH patients.

It is also important to realize the different degrees of severity of excessive sweating within PPH population. Among the PPH population in our survey, 93.87% cases were classified as degree 2 of severity scale, and only 6.12% cases were in degree 3. Actually, most patients who resorted to treatment in clinic were in degree 3. Patients in degree 2 usually gain good tolerance of excessive sweating and reluctant to pursue a medical intervention. This distribution of severity reminds us to evaluate the symptom of PPH in more detail at diagnostic study.

In this study, family propensity was found in 15.3% of PPH population. Ro et al. [8] reported an incidence of positive family history, 65%, in a sample of 49 patients with hyperhidrosis that had undergone thoracoscopic sympathectomy. Additional studies have also suggested a genetic cause of PPH. Stromme et al. [9] in their description of the localization of the cross-linked mental retardation disease gene Xp11.4-Xp22.11 found that 12 of the 13 patients examined had a history of hyperhidrosis. A pedigree analysis by Kaufmann et al. [10] suggested that the disorder segregated independently as an autosomal dominant trait and was not inherited as a cross-linked trait. There is no doubt that more researches are necessary to localize the disease gene of PPH and ultimately to identify the cause of defect.

One limitation of the study is that only adolescents in high schools and colleges were surveyed. As a cross-sectional study, it does not tell about the prevalence of PPH outside this age group, although most PPH is typically present in childhood or adolescence and symptoms may last for life [1].

Fortunately, the prevalence of PPH was not gender dependent, which may lessen the weakness of this study.

Our data provide some original information on PPH. The results of this study indicate PPH affects a larger group of individuals than previously recognized. We anticipate that better understanding and increasing awareness on PPH will enable patients and physicians to accept the disorder as a medically validated condition. This may help to make early diagnosis and provide early treatment.

References


