Childhood Chronic Fatigue Syndrome and School Phobia in Junior High Students in Japan

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ABSTRACT

The Japanese Ministry of Education, Culture, Sports, Science and Technology reported in 2007 that 105,000 junior high school students (2.91% of all students) had "school phobia". Over the last 15 years, a considerable number of students diagnosed with school phobia have been found to fulfill diagnostic criteria for childhood chronic fatigue syndrome (CCFS). Symptoms of CCFS are similar to those seen in adult chronic fatigue syndrome. In this study, 128 junior high school students with the chief complaint of school non-attendance were presented to the Department of Child Development Outpatient Clinic at Kumamoto University (Jan.-Dec. 2008). They were medically examined using the 2007 international CCFS case definition, and given a Performance Status Score, a measure of functional status. Results showed that 72 (56.3%) students fulfilled CCFS criteria for severe or moderate illness, and 35 students (27.3%) were diagnosed with atypical CCFS or CCFS-like disorder. Twenty one patients (16.4%) either met criteria for other conditions including hyperthyroidism, major depression and narcolepsy or were without clear diagnosis. The results suggest that a diagnosis of CCFS is often associated with school non-attendance or school phobia in Japan.
INTRODUCTION

School phobia in children has attracted attention as a serious social issue in Japan. Recently, this issue has become a major concern because of its impact on social withdrawal in Japanese young adults. In the year 2007, 24,000 primary school children (0.34% of all students) and 105,000 junior high school students (2.91% of all students) were classified with "school phobia", according to an investigation by the Japanese Ministry of Education, Culture, Sports, Science and Technology.

Children with school phobia exhibit symptoms consistent with sleep disorders, such as being easily fatigued, lack of scholastic motivation, emotional instability, and impaired learning and memory. These symptoms seriously affect children’s social and school life and/or even normal daily life (1, 2). Once a child is afflicted with this condition, it may take several years for a complete recovery.

Based on this background, we have surmised that many students with school phobia might also suffer from childhood chronic fatigue syndrome (CCFS) as defined by international criteria established in 2007 (4). CCFS is similar to adult chronic fatigue syndrome (1, 3). For the past 15 years, our research group has endeavored (a) to confirm that school phobia is associated with a diagnosis of CCFS and (b) to understand the pathophysiology of CCFS. In this report we evaluated 128 students with a chief complaint of non-school attendance to determine if they fulfilled the international case criteria for CCFS.

MATERIALS AND METHOD

Participants included 128 junior high school students (67 boys, 61 girls, aged 12-15 years, mean age 13.3±0.94). With a chief complaint of “school non-attendance”, these students visited the outpatient clinic of the Department of Child Development at Kumamoto University School of Medicine from January 2008 to December 2008. All participants were examined medically and then evaluated using the international case definition for CCFS (4, 5) and also the Performance Status Score (PS), a measure of functional status. The PS was established by the research group for Childhood Chronic Fatigue Syndrome. This group was organized by the Japanese Ministry of Health, Labour and Welfare (2004) for evaluations of school non-attendance during medical examinations.
RESULTS

On the basis of our evaluations, the 128 participants were divided into 5 diagnostic groups (Table 1): 1. severe CCFS (31.3%), 2. moderate CCFS (25%), 3. atypical CCFS (24%), 4. CCFS-like disorder (3%), and 5. others (16.4% with medically explained disorders or without clear diagnosis). Furthermore, we analyzed the symptom differences between the five diagnosis groups using ANOVA. Significant differences were found between the five groups for all eight symptoms. Severe type CCFS showed significantly higher PS scores (greater functional limitations) and significantly longer illness duration than the other diagnostic groups. Table 1 indicates which groups showed significant differences for each symptom. We used a Bonferoni correction for every group. There were no significant differences in age or gender between diagnostic groups.

Table 1.  
Comparison of symptoms between 5 groups

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Severe CCFS</th>
<th>Moderate CCFS</th>
<th>Atypical CCFS</th>
<th>CCFS-like</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Fatigue</td>
<td>40</td>
<td>32 *</td>
<td>30 *</td>
<td>4</td>
<td>17 *</td>
</tr>
<tr>
<td>II. Post-Exertional Malaise</td>
<td>40</td>
<td>29 c</td>
<td>20 b</td>
<td>4</td>
<td>10 b</td>
</tr>
<tr>
<td>III. Sleep</td>
<td>40</td>
<td>29</td>
<td>22 a</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>IV. Pain</td>
<td>40</td>
<td>27</td>
<td>25</td>
<td>4</td>
<td>13 b</td>
</tr>
<tr>
<td>V. Neurocognition</td>
<td>40</td>
<td>30 *</td>
<td>22 a</td>
<td>4 e</td>
<td>8 b</td>
</tr>
<tr>
<td>VI-1. Autonomic Manifestation</td>
<td>37</td>
<td>21</td>
<td>22</td>
<td>2</td>
<td>11 a</td>
</tr>
<tr>
<td>VI-2. Neuroendocrine Manifestation</td>
<td>36</td>
<td>19 a**</td>
<td>7 e</td>
<td>3</td>
<td>4 e</td>
</tr>
<tr>
<td>VI-3. Immune Manifestation</td>
<td>17</td>
<td>7</td>
<td>4 a</td>
<td>3 a</td>
<td>1 a</td>
</tr>
</tbody>
</table>

* significant difference between severe ME/CFS (P <.05);  
** significant difference between severe ME/CFS (P <.001);  
a significant difference between atypical ME/CFS (P <.05);  
aa significant difference between atypical ME/CFS (P <.001)
DISCUSSION

The critical question addressed in this study was whether school phobia and CCFS are related entities. Our results revealed that 56% of students with school phobia met criteria for a diagnosis of CCFS. More generally, 89% of these students presented with chronic fatigue without any identifiable disease. Based on projections from our data, 2.59% of junior high students in Japan would be classified as having CCFS. It is necessary to follow these cases, to determine clinical course and outcomes.

Medical concern for students with possible school phobia should begin when they exhibit symptoms such as abnormal sleep patterns, easy fatigability, learning impairment, confusion, and/or depression. This contrasts with the commonly held belief that “psycho-social factors” or “laziness” are the main reasons for school phobia. For the last 15 years, we have considered the term ‘school phobia’ to be closely related to CCFS, due to the large number of symptoms that fulfill the criteria for adult type CFS (1).

In prior research, we have tried to determine the medical and physiological underpinnings of the condition. Consequently, we have generated various datasets that provide evidence in school phobia cases for the following abnormalities: dysfunction of the autonomic nervous system, disturbance of sleep-awake patterns (6), disturbed core body temperature (7), hormonal secretion rhythms (8), disturbances of circadian expression of the clock gene (9, 10), decreased cerebral blood flow (11), accumulation of cholin in frontal lobe (12), and abnormal glucose metabolism (13).

Recently, Viner et al. (14) reported only 0.16% CCFS cases observed in 1880 children (aged 11-12, 13-14 years) during a 3-year cohort study in England. In another study in the UK (15) the prevalence of fatigue lasting more than 3 months was 2.34% and the presence of a CFS-like illness was 1.29%. Perhaps the most comprehensive fatigue prevalence study (16) was a telephone survey of 28,673 American households. In this study, adult household members were asked about fatigue and other symptoms present in the children of the household. In children ages 5 to 17, 4.4% were reported to experience persistent fatigue, and 2.05% experienced a CFS-like illness, i.e., fatigue and somatic symptoms suggestive of CFS. Further analysis showed that 2.91% (2910 per 100,000) of adolescents, and 1.96% (1960 per 100,000) of children under the age of 13 had a CFS-like illness. The prevalence of CCFS in these countries is comparable to our figures.
In conclusion, our findings suggest that school phobia and CCFS overlap substantially in Japanese children of junior high school age. Further study of these children is needed to develop improved public awareness, to identify biomedical abnormalities, and to test potential intervention protocols to help these children.
REFERENCES

5. Jason L, Porter N, Shelleby E, Till L, Bell DS, Lapp CW, Rowe C, De Meirleir K. Severe versus moderate criteria for the new pediatric case definition for ME/CFS. Child Psychiatry Hum Dev Published online 2009; 10 June

