

Clinical characteristics of teenagers encountered by general physicians in Japanese hospitals: a cross-sectional study

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Research

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Abstract

Background

Although the number of teenage outpatients is not very high, it is sometimes difficult to manage them. To clarify the factors contributing to this difficulty, we retrospectively analyzed the clinical characteristics of the patients using medical records from three hospitals.

Methods

The study included 342 patients aged 13–19 years who visited the Department of General Internal Medicine at Toyama University Hospital, N Municipal Hospital, and K General Hospital between January 2019 and December 2021. Data on age, sex, referral status, chief complaint, period from onset to visit, and final diagnosis were collected from the medical records of each hospital. We used the Multiple comparison analysis by the Tukey honestly significant difference method, chi-square test, and residual analysis for statistical analyses of our data.

Results

Most cases from the two city hospitals visited within one month from the onset and were treated as mild cases of acute upper respiratory infections, gastroenteritis, and traumatic injury. However, 56% of the patients visited the university hospital more than one month after the onset of illness. In addition, half of the patients were diagnosed with stress-related mental diseases, such as adjustment and eating disorders. The teenage patient group at the university hospital also had significantly higher rates of psychiatric diseases than the other age groups. Furthermore, most psychiatric patients complain of various somatic symptoms, such as somatic diseases. This situation may contribute to the difficulty in dealing with teenage outpatients.

Conclusion

Our data suggest that some teenagers complaining of somatic symptoms have stress-related mental illness, especially in university hospitals. These patients require not only physical management, but also environmental and emotional support. Therefore, the psychosomatic approach is essential for general practitioners, particularly for those who often encounter teenage patients.

Background

General physicians have various terms of address based on their clinical setting. Family physicians (general practitioners in the UK) provide continuous and comprehensive healthcare for individuals and families [1] mainly at private clinics or home visits. Additionally, hospitalists treat hospitalized patients

only [2]. Most Japanese general internists at hospitals currently provide medical care to outpatients, with approximately half of them—including Toyama University Hospital—also treating inpatients [3]. In ambulatory practice, general internists in hospitals deal with various complaints from a wide age range of patients [3]. Although the number of teenage outpatients is not very high, it is sometimes difficult to manage them, compared to ordinary younger people. [4]. To clarify the factors contributing to this difficulty, we retrospectively analyzed the patients' clinical characteristics using medical records from three hospitals in the same prefecture.

Methods

Subject and methods

This study was jointly conducted by Toyama University Hospital, Nanto Municipal Hospital, and Kamichi General Hospital in Toyama Prefecture, Japan. Toyama Prefecture is located on the coast of the Sea of Japan in the Chubu region of central Honshu Island. Toyama University Hospital (612 hospital beds) is one of the Japanese National University Hospitals that mainly provides advanced medical care, and the Department of General Internal Medicine also provides primary care. Nanto Municipal Hospital, located west of Toyama (175 hospital beds), and Kamichi General Hospital (199 beds), located on the east side, are public city hospitals that provide community health care. General internists and family physicians staffed all outpatient departments of the three hospitals. Four physicians in Toyama University Hospital, four in Nanto Municipal Hospital, and six in Kamichi General Hospital were certified in their specialty by the Japan Primary Care Association.

Participants and Setting

Overall, 615 new walk-in outpatients who presented to the outpatient department of general medicine at the three hospitals between January 2019 and December 2021 were included in this study. From the University of Toyama Hospital, we also enrolled 2,160 new outpatients over 20 years of age—who presented during the same period—to compare the distribution of diseases among ages. We excluded 205 teenage cases from statistical analysis due to inadequate medical record entries, as well as 68 asymptomatic teenagers who visited for further medical checkups. We also excluded 632 adult cases with limited information, 87 for re-examination of the health check, and 66 due to triage for suspected COVID-19. Ultimately, 342 teenage patients at the three hospitals and 1,375 patients older than the twenties at the university hospitals were analyzed using their medical charts. Data on age, sex, referral status, chief complaint, period from onset to visit, and final diagnosis of outpatients were extracted from each hospital's medical records.

Classification of symptoms

We used "abdominal pain/discomfort" to describe patients who complained of abdominal pain with various digestive symptoms, such as nausea and diarrhea. We also used "cough/dyspnea" and "palpitations/chest pain" in the same manner.

Classification of final diagnosis

The patients were divided into three groups according to the final diagnosis: organic, functional, and psychiatric. Each disease is defined as follows: organic diseases are detectable and observable organ changes, such as infectious diseases. Functional diseases are abnormal changes in organ function—but not structural changes—such as migraine. This article used "Somatic disorders" as collectively organic and functional diseases. Psychiatric disorders are mental problems clinically diagnosed by a psychiatrist or general internist using diagnostic criteria of the DSM-5, Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition [5]. This article also describes adjustment disorders and eating disorders as "psychosomatic diseases" or "stress-related mental illnesses" because these are psychological conditions that lead to somatic symptoms, not psychotic disorders, such as schizophrenia or major mood disorders.

The period from onset to consultation

We roughly categorized the patients—by the period from onset of symptoms to ambulatory visits—into two groups: within one month and more than one month, based on the records of patients' medical histories.

Statistical analysis

Since this is an observational study without intervention, the sample size was judged to be more than sufficient to allow for group-by-group comparisons, and power analyses were not conducted. We used the Multiple comparison analysis by the Tukey honestly significant difference method, chi-square test, and residual analysis for statistical analyses of our data using Bell Curve for Excel (version 3.20). Statistical significance was set at $P<0.05$.

Ethics approval

The ethical review board of Toyama University Hospital approved this study (R2021123). Informed consent was indirectly obtained through announcements on the three hospital bulletin boards. As an ethical consideration, all data about patients were anonymized during collection from the medical records so that analysts could not match registration numbers with individuals.

Results

Background characteristics of the enrolled patients

Table 1 shows the patient characteristics. The study included 148 male and 194 female patients aged 13–19 years, with a male/female ratio of 1:1.31. The mean age was 16.6 ± 1.56 years for males and 16.7 ± 1.48 years for females. The proportion of males in the patient group at the university hospital was lower than that at the other hospitals. In contrast, the university hospital had a higher referral rate than the Nanto Municipal and Kamichi General hospitals (61.9, 7.2, and 7.5%, respectively).

Chief complaints

Almost all the patients visited hospitals with somatic symptoms (Table 1). Some of the patients had more than one symptom. Abdominal pain/discomfort, headache, and fever were the most prevalent chief complaints in all three hospitals. Respiratory symptoms were also common in the two city hospital patient groups but were minor in the university hospital patient group ($p<0.01$). Arthralgia/myalgia was more common in the Nanto Municipal Hospital than in the other hospitals ($p<0.01$).

Final diagnosis

Table 2 shows the final diagnosis for each patient group. The two city hospitals had a higher proportion of patients with organic diseases. Acute respiratory infections, such as acute bronchitis and influenza, were prevalent in the two city hospitals. Generalists in the Nanto Municipal Hospital treated more outpatients with mild traumatic injury than the other two hospitals, due to the lack of orthopedic surgeons. The organic disease group in the university hospital contained some serious conditions such as acute leukemia, eosinophilic gastroenteritis, and spontaneous intracranial hypotension.

Compared to the two city hospitals, the university hospital had more psychiatric patients with adjustment and eating disorders ($p<0.01$). There were no new cases of schizophrenia.

The excluded cases (University Hospital, 22; Nanto Municipal Hospital, 156; Kamichi General Hospital, 35) seemed to have mainly transient infections, such as common cold or enteritis; however, we could not confirm their diagnoses from the medical charts. There were no teenage patient referrals from these two hospitals' generalists to that of the university hospital during the study period. All patients seen for re-examination during health checkups had no severe problems.

The period from onset to consultation

Most patients in the two city hospitals visited the outpatient department within one month of symptom onset (Fig. 1). On the other hand, 56% of the cases at the university hospital were observed more than one month after symptom onset.

Subanalysis of the university hospital patients

At the university hospital, the teenage patient group had significantly higher rates of psychiatric disorders than the other age groups (Table 3), and most psychiatric teenagers visited one month after symptom onset (Fig. 2). Regarding the proportion of abdominal pain as a chief complaint, there was no difference between the somatic and psychiatric groups in the university hospital—which were 32/58 and 11/26, respectively ($p=0.63$). Sixteen attended a psychiatric clinic currently or previously, and eight were newly referred to psychiatrists by generalists. Ten of the 18 patients (4 males, 14 females) who could not attend school because of inadequate physical conditions had psychiatric disorders such as adjustment disorder, obsessive-compulsive disorder, and mutism. Eleven patients who complained of academic stress,

including academic performance at school and preparation for entrance examinations, were female. They had no socioeconomic problems and were students of the best college-prep schools.

Discussion

Unlike the two city hospitals, more than half of the teenagers in the university hospital group visited general internists one month or later after noticing their symptoms. Furthermore, most of them were psychiatric patients complaining of various somatic symptoms. This situation may contribute to the difficulty in dealing with teenage outpatients.

General internal medicine in university hospitals usually receives many referrals from clinics and other hospitals [3]. Additionally, primary care and psychosomatic medicine in Japan are closely related, as they share historical backgrounds concerning their establishment [6, 7, 8]. Therefore, general internists at university hospitals in Japan often encounter challenging patients who do not fit biomedical criteria [9, 10]. Notably, teenage patients had a higher rate of psychiatric diseases than the other age groups in the present study. Therefore, we inferred those teenagers might have characteristics that make them more prone to psychiatric disorders.

Characteristics of Adolescents

In general, adolescence—from ages 10 to 19—is a period of dynamic change across multiple systems [4, 11]. It is also a vulnerable and sensitive period to negative and positive experiences [12]. Therefore, various stressors may be associated with distress and somatic symptoms among adolescents. Furthermore, from a mental health perspective, adolescence is critical because many major mental disorders develop during this period [13]. In addition to these adolescent characteristics, we speculate that school-related stress and low self-esteem are key factors in psychosomatic problems among teenagers.

School-related stress affects students' physical and mental health in many developed countries [14, 15, 16]; additionally, university-preparatory schools are competitive environments, especially in Japan.

Low self-esteem positively correlates with youths' physical and mental problems [17, 18, 19, 20]. In addition, low self-esteem in early teens is also a notable risk factor for developing an eating disorder and other psychological problems by the age of 15-16 [21].

Gender difference

Our data showed that most of the patients with psychiatric disorders in the university hospital group were female. Many studies support the trend toward more stress-related mental illnesses in women. Studies in western countries indicated that subjective health complaints and psychosomatic symptoms are prevalent in adolescent females [22, 23]. Other studies have shown that adolescent females tend to have lower self-esteem and more negative assessments of their physical characteristics and intellectual abilities than males [17, 20]. We did not conduct an objective evaluation of the patients' self-esteem in

this analysis; however, the evaluation of the patients derived from these previous studies [17,20, 22, 23] is consistent with our experience. These findings may potentially explain why psychosomatic mental illness is substantially higher in females in university-prep high schools. Improving self-esteem and developing a sense of coherence may be essential for these patients [24, 25, 26].

Somatic symptoms

In teenagers, abdominal pain, headache, and fatigue are common psychosomatic symptoms [15, 16, 27]. Ample literature indicates that abdominal pain is the most common physical complaint in adolescents and is associated with depression and anxiety [27, 28, 29, 30]. In the present analysis, abdominal pain was the most common symptom in both the psychiatric and somatic disease groups (34.6, 20.6%, respectively). In such cases, a long clinical history of over one month may suggest a nonorganic disorder.

Approximately one-third of the excluded patients (70/205) complained of abdominal pain or headache. Unfortunately, we were unable to follow-up on their subsequent medical treatment, including visits to other hospitals. Hence, some may have stress-related mental illnesses.

Environmental coordination and psychological support are more critical than pharmacotherapy when managing stress-related mental illnesses. Therefore, physicians who provide healthcare for adolescents should pay special attention to these factors, not only to organic diseases.

Limitations

The current study had several limitations. First, this was a retrospective observational study conducted in part of Japan. Therefore, results may vary across regions and hospitals. Second, the outcomes of the excluded patients were not confirmed. Third, our sample size was small. Therefore, further, larger studies are needed to clarify these issues.

Conclusion

In conclusion, our data suggest that some teenagers complaining of somatic symptoms may have stress-related mental illnesses, especially in university hospitals. Therefore, a psychosomatic approach is essential for general physicians, particularly those who often encounter teenage patients.

Declarations

Ethics approval and consent to participate

The ethical review board of Toyama University Hospital approved this study (R2021123). Informed consent was indirectly obtained through announcements on the three hospital bulletin boards. As an ethical consideration, all data about patients were anonymized during collection from the medical records so that analysts could not match registration numbers with individuals.

Consent for publication

Not applicable.

Availability of data and materials

The datasets analyzed during the current study are not publicly available because individual privacy could be compromised but are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Not applicable.

Authors' contributions

KK designed the study. KK, DO, and AS collected the data, and SK and KK performed statistical analyses. KK, DO, MK, MS, SY drafted the manuscript. All authors have read and approved the final manuscript.

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Tables

Tables 1 to 3 are available in the Supplementary Files section.

Figures

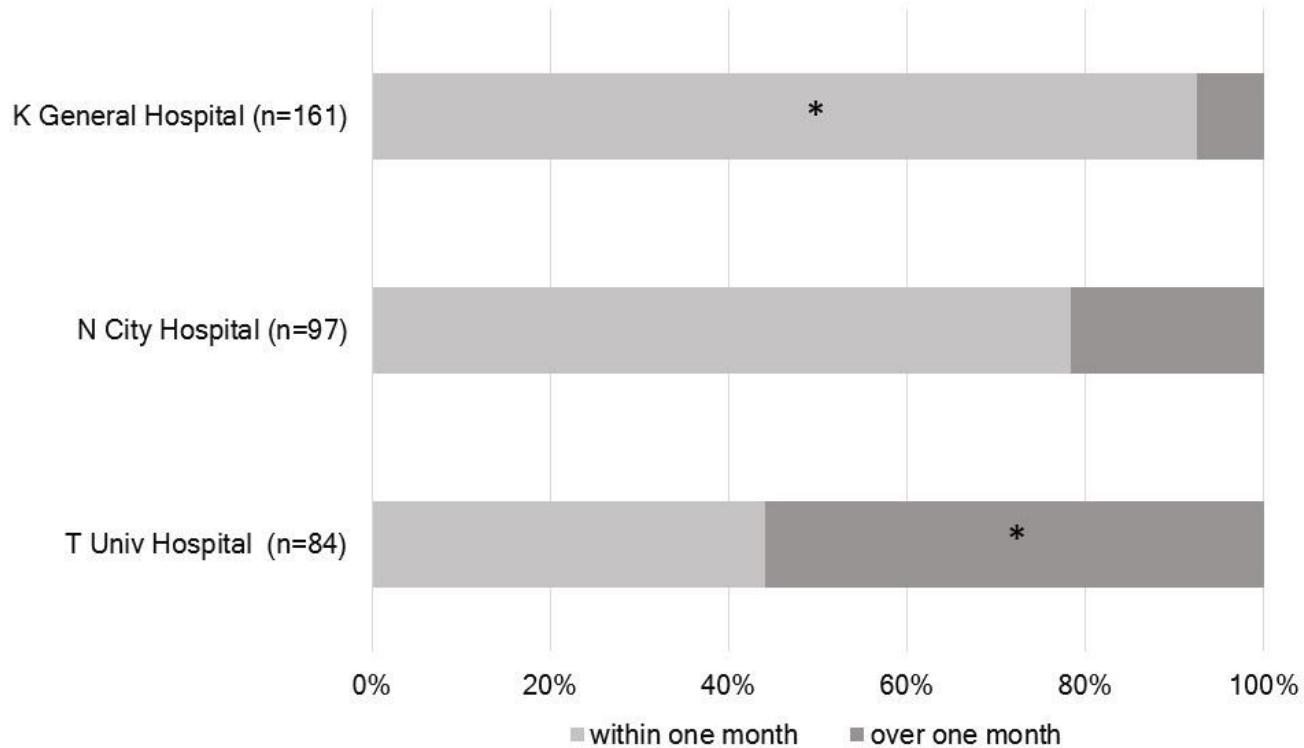


Figure 1

Period from onset to consultation of each patient group.

*Residual analysis based on the chi-square test, which examines the difference between the real and expected value at each cell. *: greater than expected value, P<0.01.

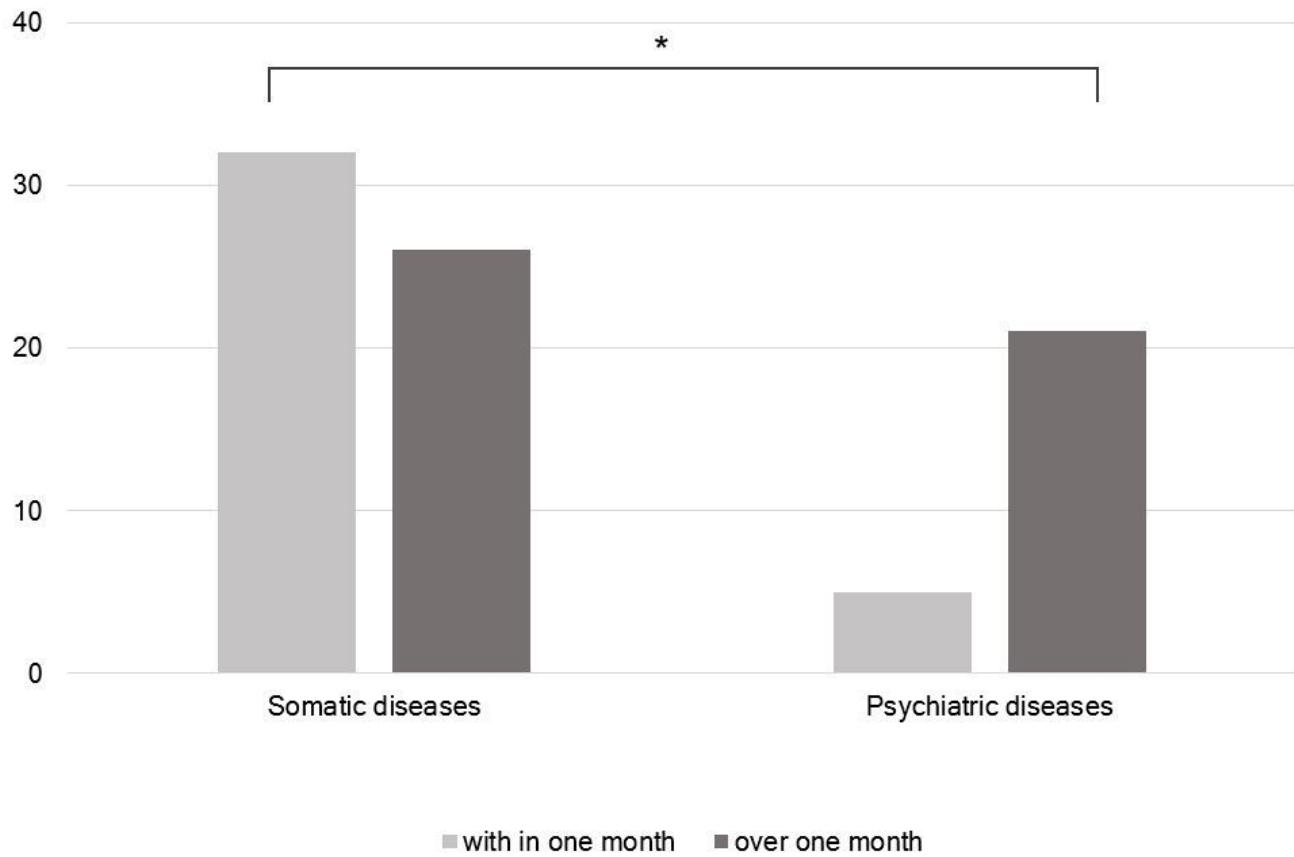


Figure 2

Distribution of period from onset to consultation by disease group at the University Hospital.

*p=0.0023 chi-square test for comparison of somatic vs psychiatric patient group.

Supplementary Files

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