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ORIGINAL PAPER

Prevalence, incidence, and stimulant use of attention-deficit hyperactivity disorder in Taiwan, 1996–2005: a national population-based study

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Abstract
Purpose We used National Health Insurance (NHI) database to examine the prevalence, incidence, and stimulant use of attention-deficit hyperactivity disorder (ADHD) diagnosis in Taiwan.
Methods The National Health Research Institute provided a database of 10,00,000 random subjects for study. A population-based random sample of 372,642 patients aged younger than 18 was obtained as a dynamic cohort. Those study subjects who had at least one service claim from 1996 to 2005, with a principal diagnosis of ADHD, were identified.
Results The cumulative prevalence of ADHD diagnosis increased from 0.06 to 1.64 % from 1996 to 2005. The annual incidence of ADHD diagnosis increased from 0.02 to 0.34 % from 1997 to 2005. The highest incidence rates of ADHD diagnosis for both males and females were in the 6- to 11-year age group. Higher incidence was detected in males (HR 3.76, 95 % CI 3.48–4.07), those who lived in northern region (HR 1.35, 95 % CI 1.07–1.71) and urban area (HR 1.53, 95 % CI 1.40–1.66). The percentage of stimulant use in children with ADHD diagnosis increased from 39.6 to 54.0 % from 1997 to 2005.
Conclusions Our findings suggest increases in the prevalence and incidence rates of ADHD diagnosis in Taiwan, which was in line with those studies of Western countries. However, the prevalence of ADHD diagnosis in the NHI program was still much lower than in the community studies. The percentage of stimulant use in children with ADHD diagnosis also has an increasing trend, which warrants further study.

Keywords Prevalence · Incidence · Stimulant · ADHD · National Health Insurance · Taiwan

Introduction

Attention-deficit hyperactivity disorder (ADHD) is the most common mental illness with onset in childhood and result in a chronic (long-lasting) neurobehavioral disease burden [1]. The health care and social costs of treating patients with ADHD have produced a significant economic impact [2]. A conservative estimate of the annual societal cost of ADHD is $42.5 billions in USA [2]. Three behavioral features were conceptualized in ADHD, including inattention, impulsivity, and hyperactivity. Many studies have focused on the prevalence and incidence of ADHD [3, 4]. Among these studies, however, there are great variations in the prevalence and incidence rates of ADHD, depending on different assessment processes, diagnostic criteria, sampling methods, observational time periods, and differences in cultural perceptions and expectations [5]. Overall, the prevalence rates of ADHD range from 2 to 17 % [3–8]. The estimate of prevalence in ADHD is 5–10 % in school-aged children [6].

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A population-based birth cohort study revealed the cumulative incidence of ADHD between ages 5 and 19 years was 7.5 % [9]. Previous studies reported that the prevalence and incidence rates of ADHD were associated with age and sex [9, 10]. Generally, the incidence of ADHD was highest in the 6- to 12-year age group [9], and males had higher prevalence and incidence rates than did females [9, 10].

In a previous community survey, using the Chinese version of the Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS-E) in Taiwan covering the period 1994–1995, the prevalence rates for ADHD in the seventh, eighth, and ninth grade students were 7.5, 6.1, and 3.3 %, respectively [11]. However, there has been no community study to investigate the incidence of ADHD in Taiwan. With respect to stimulant use, several studies reported increased stimulant usage for ADHD after the 1990s [12, 13].

Several reports have used health care registration data to perform epidemiological studies of ADHD [9, 14]. Taiwan implemented the National Health Insurance (NHI) program, a comprehensive, unified, universal health insurance program for all citizens of Taiwan in March 1995. Therefore, a certain amount of risk pooling for NHI should be expected. The coverage provided outpatient service, inpatient care, Chinese medicine, dental care, childbirth, physical therapy, preventive health care, home care, and rehabilitation for chronic mental illness [15, 16]. The system covers most forms of treatment, including surgeries and related expenses such as examinations, laboratory tests, prescription medications, supplies, nursing care, hospital rooms, and certain OTC drugs. The Bureau of NHI has contracted with 92 % of medical institutions in Taiwan. As many as 98 % of residents of Taiwan have joined the NHI program in 2005. Therefore, we could use the precious NHI claim data for health care service study of ADHD.

In this study, we first investigated the prevalence and incidence of ADHD diagnosis in Taiwan based on NHI data from 1996 to 2005. Second, we detected age- and sex-specific cumulative prevalence and annual incidence of ADHD diagnosis. Third, we discuss predictive factors associated with the incidence of ADHD diagnosis. Fourth, we investigated the percentage of stimulant use in children with ADHD diagnosis. Finally, we also discuss factors associated with stimulant use in children with ADHD diagnosis.

Methods

Sample

The NHI database of medical claims includes outpatient care, inpatient care, dental services, and prescription drugs. For the study, the National Health Research Institutes (NHRI) used the NHI enrollment database to identify a random sampling file. The NHRI provided a database of 10,00,000 random subjects, about 4.5 % of the population, to perform a related health service study. Longitudinal Health Insurance Database (LHID) 2005 contains the original claim data of 10,00,000 beneficiaries enrolled in 2005 randomly sampled from the year 2005 Registry for Beneficiaries of the National Health Insurance Research Database, where registration data of everyone, who was a beneficiary of the NHI program during the period of 2005, were drawn for random sampling. All the registration and claim data of these 10,00,000 individuals collected by the NHI program constitute the LHID 2005. There were no statistically significant differences in age, sex, and average insured payroll-related amount between the sample group and all enrollees [15, 16]. The data consisted of outpatient care and inpatient records, as well as the registration files of the insured. The study was approved by the Jianan Mental Hospital Institutional Review Board.

With regard to the newborn effect, a dynamic cohort was used in the present study. The study subjects were limited to those younger than 18 years of age. The initial sample consisted of 268,753 subjects in 1996. In the years 1997–2005, 13,874, 13,299, 12,057, 12,344, 12,613, 10,610, 10,364, 9,507, and 9,221 newborns entered this cohort, whereas 18,436, 18,235, 17,641, 16,679, 16,283, 15,024, 14,255, 13,503, and 13,132 enrollees who turned 18 exited this cohort in the respective years. Finally, a total of 372,642 subjects were observed in this cohort from 1996 to 2005 [18].

Definition of ADHD diagnosis

In general, the diagnostic coding of NHI in Taiwan follows the International Classification of Disease, 9th revision, Clinical Modification (ICD-9-CM) diagnostic criteria [17]. Those study subjects who had at least one service claim during the years 1996–2005 for either outpatient or inpatient care with a principal diagnosis of ADHD (ICD-9-CM 314) were identified. Thus, ADHD included attention-deficit disorder (ICD-9-CM 314.0), hyperkinesis with developmental delay (314.1), hyperkinetic conduct disorder (314.2), other specified manifestations of hyperkinetic syndrome (314.8), and unspecified hyperkinetic syndrome (314.9). The ADHD defined here were equivalent to attention-deficit/hyperactive disorder as defined in the Diagnostic and Statistical Manual of Mental Disorders, 4th revision (DSM-IV) diagnostic criteria, including attention-deficit/hyperactive disorder, combined type (314.01); attention-deficit/hyperactive disorder, predominantly inattention type (314.00); attention-deficit/hyperactive disorder, predominantly hyperactive-impulsive type (314.01);

and attention-deficit/hyperactive disorder, not otherwise specified (314.9) [19].

The prevalence of ADHD diagnosis

Subjects who had at least one service claim of ADHD for either outpatient or inpatient care were defined as a case for each year from 1996 to 2005. The cumulative prevalence of each year from 1996 to 2005 was calculated. The numerator was the number of prevalent cases of ADHD from 1996 to 2005, and the denominator was the number of total study subjects in each year from 1996 to 2005.

The incidence of ADHD diagnosis

A subject who had his or her first contact with the health services and was diagnosed as having ADHD during the given year and had not been diagnosed as a case of ADHD during the previous years was defined as an incident case. The incidence of each year was calculated from 1997 to 2005. The numerator was the number of the incident cases. The denominator was the person-years contributed by the study subjects. Subjects who were not diagnosed as autistic at the end of the year contributed 1 person-year to the denominator. Subjects who were newly diagnosed with ADHD during the year contributed one-half person-year to the denominator [20]. The incidence was also calculated by age and sex from 1997 to 2005.

The percentage of stimulant use in children with ADHD diagnosis

The percentage of stimulant use in children with ADHD diagnosis from 1997 to 2005 was also calculated. The numerator was the number of stimulant use in children with ADHD diagnosis from 1997 to 2005, and the denominator was the number of prevalent cases of ADHD in each year from 1997 to 2005.

Other measures

The information on demographic factors, including age, sex, region, and urbanization were obtained directly from the Bureau of the NHIs files. Age was divided into one of three categories: 0–5, 6–11, and 12–17 years old. With respect to geographical distribution, the study subjects were classified into one of four regions: northern, central, southern, and eastern. Urbanization was divided into urban, suburban, and rural categories.

Statistical analysis

The differences in the cumulative prevalence and annual incidence between the sexes in every age group of ADHD diagnosis were tested by χ^2 test. Cox regression analysis was used to analyze the predictive factors for the occurrence of ADHD diagnosis from 1997 to 2005. Logistic regression analysis was used to analyze factors associated with stimulant use in children with ADHD diagnosis in 2005. SAS version 9.0 was used to link and analyze the data. In this study, the significance level was set at 0.05.

Results

Table 1 shows the cumulative prevalence from 1996 to 2005 and annual incidence of ADHD diagnosis from 1997 to 2005 in NHI enrollees. The 1-year prevalence of ADHD diagnosis was 0.06 % in 1996, and the cumulative prevalence of ADHD diagnosis increased to 1.64 % in 2005. The annual incidence of ADHD diagnosis increased from 0.02 % in 1997 to 0.34 % in 2005.

With respect to the age- and sex-specific cumulative prevalence and annual incidence of ADHD diagnosis in NHI enrollees from 1997 to 2005, the highest prevalence rates for males were in the 6- to 11-year age group (4.04 %), and the highest prevalence rates for females were

Table 1 Cumulative prevalence and annual incidence of ADHD, 1996–2005

Year	Prevalent cases	Cumulative prevalence (per 100)	Incident cases	Person-year	Annual incidence (per 100)
1996	169	0.06	–	–	–
1997	227	0.09	64	263,996.0	0.02
1998	371	0.14	149	258,958.5	0.06
1999	758	0.30	388	253,107.0	0.15
2000	1,126	0.45	376	248,398.0	0.15
2001	1,530	0.62	413	244,342.5	0.17
2002	2,010	0.83	498	239,491.0	0.21
2003	2,446	1.03	452	235,141.0	0.19
2004	3,033	1.30	619	230,641.5	0.27
2005	3,754	1.64	771	226,085.5	0.34

Table 2 Cox regression model of factors associated with incidence of ADHD from 1997 to 2005

Variable	Cox regression model	
	Hazard ratio	95 % CI
Sex		
Male	3.76**	3.48–4.07
Female	1.00	–
Region		
North	1.35*	1.07–1.71
Center	0.75*	0.58–0.95
South	1.13	0.89–1.43
East	1.00	–
Urbanization		
Urban	1.53**	1.40–1.66
Suburban	0.96	0.85–1.09
Rural	1.00	–

* $P < 0.05$; ** $P < 0.001$

Table 3 Logistic regression model of factors associated with stimulant use in children with ADHD diagnosis in 2005

Variable	Logistic regression model (stimulant use)	
	Odds ratio	95 % CI
Age (years)		
0–5	1.00	–
6–11	9.28**	6.41–13.43
12–17	17.69**	11.29–27.71
Sex		
Male	1.35*	1.00–1.81
Female	1.00	–
Region		
North	0.88	0.40–1.93
Center	0.79	0.34–1.83
South	1.19	0.53–2.68
East	1.00	–
Urbanicity		
Urban	1.43*	1.05–1.94
Suburban	1.04	0.66–1.64
Rural	1.00	–

* $P < 0.05$; ** $P < 0.001$

also in the 6- to 11-year age group (1.19 %). The highest incidence rates for males were in the 6- to 11-year age group (0.46 %), and the highest incidence rates for females were also in the 6- to 11-year age group (0.11 %). In addition, males also had a higher incidence rate of ADHD diagnosis than that of females in all three age groups.

Table 2 shows the Cox regression analysis of factors associated with the incidence of ADHD diagnosis from 1997 to 2005. Higher incidence was detected in males, those who lived in the northern region and urban areas.

With regard to stimulant use, the percentage of stimulant use in children with ADHD diagnosis increased from 39.6 to 54.0 % from 1997 to 2005. Table 3 shows factors associated with stimulant use in children with ADHD diagnosis in 2005. Higher stimulant use was associated with age 6–11 group and age 12–17 group, males, and those who lived in urban areas.

Discussions

To our knowledge, this study is the first to use population-based NHI data to detect the prevalence and incidence of ADHD diagnosis in Taiwan. There is no previous community study to discuss the incidence of ADHD diagnosis in Taiwan. Besides, we also analyzed the stimulant use in children with ADHD diagnosis.

The current study revealed 1-year prevalence rate of 0.06 % and 10-year prevalence rate of 1.64 % for ADHD diagnosis. The annual incidence of ADHD diagnosis also increased 13-fold from 0.02 to 0.34 % from 1997 to 2005. The prevalence and incidence of ADHD for the treatment increased over the years in the NHI program, which was in line with the findings of other studies [5, 10, 21]. Several factors should make contributions to this increase. First, DSM-IV criteria have broader diagnostic criteria of ADHD than those of DSM-III-R [5]. Second, both parents and teachers have more concepts about ADHD (such as inattention, impulsivity, and hyperactivity) [22, 23]. Third, the NHI program in Taiwan has offered better access with a higher treatment rate of ADHD year by year. Fourth, less barriers to appropriate services has been provided by child psychiatrists and pediatric specialists. Finally, it may represent a true increase in the incident rates of ADHD on account of nature and nurture factors.

The prevalence of ADHD for the treatment in the 6- to 11-aged (school-aged) children was 2.68 %, which was lower than those found in previous community studies [7, 11]. According to the prevalence rates of ADHD (5–7 %), over 50 % of children with ADHD did not receive treatment in Taiwan. Froehlich et al. [10] also found that less than half of children with ADHD had been diagnosed or been treated with ADHD medications. Actually, not all children with ADHD came to search for treatment on account of several reasons, such as service access, parents' concepts, and teachers' detection [24]. We still must emphasize early detection, assessment, and management of ADHD in Taiwan.

In considering age- and sex-specific incidence rates of ADHD, we found that both males and females had the highest incidence for treatment between the ages of 6–11 years, which was consistent with those findings of

other studies and general clinical observations [11, 19]. Children with ADHD have onset (with disruptive behavior or impulsivity) before age 7, while they were brought into contact with health services in school age usually. A birth cohort study using medical and school records reported that the mean age for definite diagnosis of ADHD was 10 years [9]. In general, children with hyperactivity, impulsivity, and poor attention were gradually noted by school teachers a few years after they entered the elementary school. The manifestation of ADHD may affect academic performance and social relationship with other peer classmates in these children. After the implementation of NHI program in Taiwan, more parents and teachers have learned to bring their children for the assessment of ADHD like pictures. Thereafter, we must emphasize not only the need for early detection, but also the need for optimal treatment of patients with ADHD.

According to the Cox regression analysis, males have a higher incidence of ADHD than that of females (HR 3.76), which was similar to the findings in other studies [9]. Consequently, ADHD is a child and adolescent psychiatric disease with obvious gender difference. Moreover, both boys and girls have the most developmental characteristics during this period, including physical and psychological changes. Especially, boys have a much higher prevalence of subtypes (combined type and hyperactive-impulsive type) of ADHD than those of girls [10]. These two subtypes of ADHD may carry more intrusive and disruptive behaviors than the inattention type. Thus, both parents and teachers should realize that ADHD is a disease with respect to behavior, emotion, and gender difference.

With regard to regional differences, there was a higher incidence of treated ADHD in the northern region than in other regions of Taiwan. In addition, we also found a higher incidence of treated ADHD in urban area in Taiwan. Perhaps, the modernization and industrialization bring the new occurrence of ADHD due to nurture and environmental factors. Otherwise, this may represent a better access to child psychiatric services in northern region and urban area, and there is a problem of unequal resource allocation for the treatment of patients with ADHD in different regions and rural area in Taiwan.

Our study also revealed an increasing trend (39.6–54.0 %) of stimulant use in patients with ADHD, which was consistent with other previous studies. Over 50 % of children with ADHD received stimulant treatment in Taiwan, which was different from those of US children (32 %) [10]. It is not possible to compare the results of our study with those from Froehlich et al. [10], because participants were ascertained in different ways across the studies. The current study reports the rate of treatment with stimulants in individuals who are already in contact with the health care system and were diagnosed by a physician. In the Froehlich study, individuals were ascertained from the community by the investigators, and although they might be registered in a health care system, they might have no actual access to it (because symptoms are not identified by parents/teachers, because parents are not able to take them to medical access, etc.). Giving the increasing trend of a higher percentage of stimulant use, we should closely monitor the dosage, frequency, and duration of stimulant use in children with ADHD. The current study revealed a lower percentage of stimulant use in children age younger than 6 years. The phenomenon could be explained that physicians worried about the side effect of stimulants (such as palpitation, restlessness, headache, insomnia, and loss of appetite) being prescribed to the younger children. Perhaps, the younger children with ADHD have less typical symptoms. Boys were more likely than girls to receive stimulant treatment in this study [13]. May be boys with ADHD have more hyperactivity and impulsivity, which need stimulant medication for further treatment [10, 25]. However, we should also watch out for the possibility of inadequate stimulant treatment in girls with ADHD. Besides, children living in urban area have a higher percentage of stimulant use in Taiwan. We should consider the access and equity of ADHD treatment in NHI program [26]. The economic impact on the treatment of ADHD in children and adolescents is also important and deserves future attention.

There are several advantages in using claim data for an epidemiological study of ADHD, including a large national population-based random sample, longitudinal data to detect the annual incidence and its risk factors, and available information of stimulant use. However, we still face some limitations: (1) we do not differentiate subtypes of ADHD in this study; (2) possibly, there would be problems with the reliability and validity of the secondary data; (3) finally, variables such as race and socioeconomic status were not available in current study [27, 28].

Conclusions

Our findings suggest increases in the prevalence and incidence rates of ADHD diagnosis in Taiwan, which was in line with those studies of Western countries. However, the prevalence of ADHD for treatment in the NHI program was much lower than those in the community studies. In addition, the percentage of stimulant use in children with ADHD diagnosis also has an increasing trend, which warrants further study.

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References

1. Shaywitz SE, Shaywitz BA (1987) Attention deficit disorder: current perspectives. Pediatr Neurol 3:129–135
2. Pelham WE, Foster EM, Robb JA (2007) The economic impact of attention-deficit/hyperactivity disorder in children and adolescents. Ambul Pediatr 7:121–131
3. Wolraich ML, Hannah JN, Pinnock TY, Baumgaertel A, Brown J (1996) Comparison of diagnostic criteria for attention-deficit hyperactivity disorder in a county-wide sample. J Am Acad Child Adolesc Psychiatry 35:319–324
4. Goldman LS, Genel M, Bezman RJ, Slanetz PJ (1998) Diagnosis and treatment of attention-deficit/hyperactivity disorder in children and adolescents. Council on Scientific Affairs American Medical Association. JAMA 279:1100–1107
5. Faraone SV, Sergeant J, Gillberg C, Biederman J (2003) The worldwide prevalence of ADHD: is it an American condition? World Psychiatry pp 104–113
6. Scahill L, Schwab-Stone M (2000) Epidemiology of ADHD in school-age children. Child Adolesc Psychiatr Clin N Am 9:541–555
7. Polanczyk G, de Lima MS, Horta BL, Biederman J, Rohde LA (2007) The worldwide prevalence of ADHD: a systematic review and metaregression analysis. Am J Psychiatry 164:942–948
8. Merikangas KR, He JP, Brody D et al (2010) Prevalence and treatment of mental disorders among US children in the 2001–2004 NHANES. Pediatrics 125:75–81
9. Barbaresi WJ, Katusic SK, Colligan RC et al (2002) How common is attention-deficit/hyperactivity disorder? Incidence in a population-based birth cohort in Rochester Minn. Arch Pediatr Adolesc Med 156:217–224
10. Froehlich TE, Lanphear BP, Epstein JN et al (2007) Prevalence, recognition, and treatment of attention-deficit/hyperactivity disorder in a national sample of US children. Arch Pediatr Adolesc Med 161:857–864
11. Gau SS, Chong MY, Chen TH, Cheng AT (2005) A 3-year panel study of mental disorders among adolescents in Taiwan. Am J Psychiatry 162:1344–1350
12. Safer DJ, Zito JM, Fine EM (1996) Increased methylphenidate usage for attention deficit disorder in the 1990s. Pediatrics 98:1084–1088
13. Castle L, Aubert RE, Verbrugge RR, Khalid M, Epstein RS (2007) Trends in medication treatment for ADHD. J Atten Disord 10:335–342
14. Leibson CL, Katusic SK, Barbaresi WJ, Ransom J, O'Brien PC (2001) Use and costs of medical care for children and adolescents with and without attention-deficit/hyperactivity disorder. JAMA 285:60–66
15. Chien IC, Chou YJ, Lin CH, Bih SH, Chou P (2004) Prevalence of psychiatric disorders among national health insurance enrollees in Taiwan. Psychiatr Serv 55:691–697
16. Chien IC, Chou YJ, Lin CH et al (2004) Prevalence and incidence of schizophrenia among national health insurance enrollees in Taiwan, 1996–2001. Psychiatry Clin Neurosci 58:611–618
17. Chinese Hospital Association (2000) ICD-9: CM English–Chinese Dictionary. Chinese Hospital Association Press, Taipei
18. Chien IC, Lin CH, Chou YJ, Chou P (2011) Prevalence and incidence of autism spectrum disorders among National Health Insurance enrollees in Taiwan from 1996 to 2005. J Child Neurol 26:830–834
19. Kaplan HI, Sadock BJ (2007) Synopsis of psychiatry, 10th edn. Williams & Wilkins, New York
20. Kleinbaum DG, Kupper LL, Morgensten H (1982) Epidemiologic research. Wiley, New York
21. Zuvekas SH, Vitiello B, Norquist GS (2006) Recent trends in stimulant medication use among US children. Am J Psychiatry 163:579–585
22. Sayal K, Hornsey H, Warren S, MacDiarmid F, Taylor E (2006) Identification of children at risk of attention deficit/hyperactivity disorder: a school-based intervention. Soc Psychiatry Psychiatr Epidemiol 41:806–813
23. Ullebø AK, Posserud MB, Heiervang E, Obel C, Gillberg C (2011) Prevalence of the ADHD phenotype in 7- to 9-year-old children: effects of informant, gender and non-participation. Soc Psychiatry Psychiatr Epidemiol (Epub ahead of print)
24. Hoagwood K, Kelleher KJ, Feil M, Comer DM (2000) Treatment services for children with ADHD: a national perspective. J Am Acad Child Adolesc Psychiatry 39:198–206
25. Rowland AS, Umbach DM, Stallone L et al (2002) Prevalence of medication treatment for attention deficit-hyperactivity disorder among elementary school children in Johnston County, North Carolina. Am J Public Health 92:231–234
26. Hoagwood K, Jensen PS, Feil M, Vitiello B, Bhatara VS (2000) Medication management of stimulants in pediatric practice settings: a national perspective. J Dev Behav Pediatr 21:322–331
27. Merikangas KR, He JP, Burstein M et al (2011) Service utilization for lifetime mental disorders in US adolescents: results of the national comorbidity survey-adolescent supplement (NCS-A). J Am Acad Child Adolesc Psychiatry 50:32–45
28. Rydell AM (2010) Family factors and children's disruptive behaviour: an investigation of links between demographic characteristics, negative life events and symptoms of ODD and ADHD. Soc Psychiatry Psychiatr Epidemiol 45:233–244