

INTRODUCTION

ADHD is quite prevalent neurodevelopmental disorder (Polanczyk & Rohde, 2007) with worldwide increasing prevalence estimated to be 5.29% (Polanczyk, de Lima, Horta et al., 2007). Since 1987, ADHD had been considered as a treatable disease (Olfson et al., 2003; Zametkin & Borcharding, 1989). The under-diagnosis and under-treatment of ADHD could be a marker of under-developed rwdnke" e jknf" o gpcn" j gcnvj" ectg" *Rguequqkfq" gv" cn0. " 422 : +0" E jkg { " because when many children with ADHD remains untreated in a society, they may grow up with pile of potential problem like developing offending, delinquent, antisocial behavior (Gudjonsson, Sigurdsson, Adalsteinsson, & Young, 2012). Such under-diagnosis problem might produce more social problem.

V jg" fgLpkvkqp" qh" õwpfgt/fkci pquku" qh" CF J Fö" o gcpu" pw o dgt" qh" ADHD children being clinically diagnosed is less than being presumed

hoped that this result will encourage child mental experts to be more vigilant of the unmet needs of children with ADHD in Taiwan.

METHODS

Data Sources

The participants for this study were selected from the claim dataset from outpatient records retrieved from the National Health Insurance Datasets (NHIRD) released by the National Health Insurance Administration (NHI) before release to the researchers. The NHIRD includes general information of age, gender, one principal and two secondary caregivers, encrypted by the Bureau of NHI before release to the researchers. The NHIRD is subject to the regulations of the Bureau of National Health Insurance, Institutional Review Board (IRB) approval was waived for this study.

Study Sample

This study examined children under the age of 18 with at least one outpatient visit and a primary diagnosis of ADHD (ICD-9-CM code=314: Hyperkinetic syndrome of childhood). The search of the NHIRD sought care for ADHD symptoms during 178,138 outpatient visits between 1 January 2005 and 31 December 2005. The index was the first outpatient visit was sought for the treatment of ADHD during 2005.

Administrative Diagnostic Prevalence of ADHD

The administrative prevalence of ADHD means who sought care for ADHD patients per 100 children out of the total population in 2005.

Age and Subtype

Under the study purpose of understanding under-recognized on ADHD children among various age stage, different gender and subtype, age stage is also categorized into the following four age groups: preschool (<6 years), school age (6 to 11 years), junior school age (12 to 14 years), and senior high school age (15 to 17 years). The study also categorized ADHD into four subtypes: (1) Combined ADHD (ADHD-C: ICD-9-CM code 314.01); (2) Inattentive ADHD (ADHD-I: ICD-9-CM code 314.00); (3) Others, including ADHD with developmental delay (ICD-9-CM code 314.1), ADHD with conduct disorder (ICD-9-CM code 314.2), ADHD with other manifestations (ICD-9-CM code 314.8), and ADHD with comorbidities (ICD-9-CM code 314).

Statistical Analyses

First, the number of ADHD patients by age, gender, and subtype was described. The logistical regression was performed under assuming that age, gender and subtype entered as independent predictor variables for the dependent variable of stimulant use. All analyses were performed using the SAS/Stat system for Windows, version 9.13 (SAS Institute, Cary, NC).

RESULTS

Table 1 reported the administrative prevalence of ADHD by age and gender. Of the 31,074 children who sought care for ADHD in 2005. Among different diagnostic rate by age, 0.45% for preschool aged children (< 6 years), 1.06% school aged children (6 to 11 years), 0.42% for junior school aged adolescent (12 to 14 years), and 0.11% for senior high school aged adolescent (15 to 17 years), elementary school aged children sought more help than other age

groups. Boys were more likely to be diagnosed with ADHD than girls. Figure 1 illustrates the administrative prevalence and stimulant use for patients aged between 0 and 17 years, which revealed that the peak for both prevalence and stimulant use is from the age of 6 to 8 years.

Table 2 showed the prevalence of ADHD by different subtype. The ADHD-C subtype and the ADHD-I subtype comprised 57.0% and 24.2% of the total number of children with ADHD respectively. It was more common for children with the ADHD-C subtype to seek care than children with other subtypes. Table 3 indicated that gender interaction with stimulant use, but that the interaction between gender and subtype was not significant.

DISCUSSION

This study indicates widespread under-diagnosis (0.59%) of ADHD children in Taiwan using a huge and extensive database covering 31,074 ADHD children, baseline population representing 97% of the population in Taiwan in 2005. We demonstrate only more boys, school aged, characterized as combined subtyped ADHD children are more likely to be diagnosed with ADHD than girls, pre-school aged children, and children with the ADHD-I subtype.

Accordingly in 1987 only 0.9% of children in The United States were diagnosed as ADHD (Olfson et al., 2003). But 20 years after

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Qpg"qh"vjg"rwtrqugu"qh"vjku"uvwf{"ku"vq"Łpf"y jgvjgt"dq{u" igv" more attention as a result of the more presence of a severe ADHD-C subtype. Our study result demonstrated no difference is existed about symptom severity among boy more tend to be ADHD-C subtype after we eliminate age and gender as confounding factors by logistic regression. A cultural preference of boys or other neurobiological fkhhtgpegu"vq"kpłwgpeg"vjg"u{o rvq o "ugxgtkv{"c o qpi" dq{"cpf"

study. *Uqekn"Rufekvtl"cpf"Rufekvtke"Grkfgokqni f."*69, 1885-1890. doi: 10.1007/s00127-012-0501-1