Incidence and prevalence of drug-treated attention deficit disorder among boys in the UK

Hershel Jick, James A Kaye and Corri Black

SUMMARY

Background: *Drug treatment for attention deficit disorder (ADD) was rare in the United Kingdom (UK) until in the mid-1990s. This contrasts with North America, where such treatment has been used to treat ADD for many decades. Since no quantitative data on the incidence and prevalence of drug-treated ADD are available in the UK, we used the general practice research database (GPRD) to obtain such information.*

Aims: *To provide estimates of incidence and prevalence of treated ADD in the UK for the years 1996–2001.*

Design of study: *Follow-up study of boys aged 5–14 years.*

Setting: *Data from UK general practices.*

Methods: *From the GPRD, we identified all boys aged 5–14 years who were prescribed methylphenidate for ADD. Based on the population in that age and sex category, we estimated incidence rates and the prevalence for treated ADD for the years 1996–2001.*

Results: *The incidence of first-time diagnosis of treated ADD increased among boys from the age of 5 years to reach a peak in boys aged 9–10 years, after which the incidence rate decreased. No material change in incidence was noted during the years 1996–2001. The prevalence of treated ADD was estimated to be 5.3 per 1000 boys in 1999.*

Conclusion: ***D****rug treatment for ADD for boys treated for this disorder in the UK is substantially lower than the proportion of boys treated in North America.*

Keywords: *attention deficit disorder; attention deficit and disruptive behaviour disorders; incidence; management; prevalence.*

H Jick, MD, associate professor of medicine, Boston University School of Medicine; J A Kaye, MD, MPH, DrPH, associate professor of epidemiology and biostatistics, Boston University School of Public Health, Boston University, Lexington, USA. C Black, MB, clinical lecturer in public health medicine, Department of Public Health, University of Aberdeen, Aberdeen, Scotland.

Address for correspondence

Hershel Jick, Boston Collaborative Drug Surveillance Program, Boston University School of Medicine, 11 Muzzey Street, Lexington, MA, USA. E-mail: Hjick@bu.edu

Submitted: 9 September 2003; Editor's response: 9 January 2004; final acceptance: 3 February 2004.

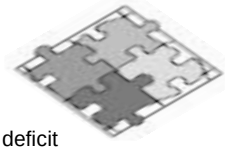
Introduction

ATTENTION deficit disorder (ADD), also often referred to as attention-deficit/hyperactivity disorder (ADHD)[1] is a developmental behaviour condition characterised by inappropriate hyperactivity, impulsiveness and inattention.[1-5] Cosgrove, in 1997, pointed out that in clear contrast to North America, 'research on ADHD and its treatment has been largely ignored by British academic child psychiatry.'[5] The diagnosis is made on a clinical basis, often together with a variety of standardised behaviour-screening tests.[3] Hundreds of articles related to ADD have appeared over the past decades, primarily in psychiatric journals published in North America.[3] In the United States (US), patients with ADD have been treated with psychostimulant drugs, particularly methylphenidate and dexamphetamine, for over 50 years.[2] Reported prevalences of ADD in the US have varied from 4% to 26%,[3] depending on the population studied and criteria for diagnosis. Until recently ADD has received less attention in the United Kingdom (UK), although a comprehensive review of the subject was published recently by Thapar and Thapar.[6] Indeed, treatment with psychostimulants, particularly methylphenidate, was rare in the UK until the mid-1990s.[7]

ADD has a number of characteristics that are similar to those of autism, a condition which has been diagnosed with increasing frequency in the last decade in the UK[8] and in other countries.[9,10] Both conditions reflect behavioural disorders and occur primarily in boys. Both also appear to have some genetic component, but the causes of the conditions are essentially unknown.[3] On the other hand, the behavioural manifestations of the two conditions are entirely dissimilar and there is specific drug treatment for ADD, but not for autism. Also, whereas the age of onset for symptoms leading to a diagnosis of autism reaches its peak at between the ages of 2–4 years,[8-10] the diagnosis of ADD tends to be made from 5 years and reaches a peak in children aged 8–10 years.[3]

The criteria for diagnosis of ADD are controversial and not well defined.[6] Many comorbid conditions; for example, depression, anxiety, and learning disabilities, have been associated with this condition.[3] It is not the intent of this paper to address the comorbidity issues, but primarily to provide estimates of incidence and prevalence of treated ADD in the UK for the years 1996–2001. The study was based on the UK general practice research database (GPRD). The completeness and accuracy of the GPRD, which is closely reflective of the population of the UK, has been repeatedly demonstrated in areas including that for the estimation of incidence rates of illnesses.[8,11-13]

HOW THIS FITS IN



What do we know?

Little prior information has been published on the incidence of attention deficit disorder (ADD) in the United Kingdom.

What does this paper add?

We have reviewed information present in the general practice research database to measure the incidence of drug-treated ADD from 1996–2001. The results provide the age distribution of cases and the incidence during these years.

Methods

The initial diagnostic coding system (OXMIS), used by the GPRD until recent years, does not contain a specific code for ADD. However, the READ coding system, introduced into many GPRD practices in the mid-1990s, does contain specific codes for ADD (E2E0.00, E2E0100, E2E..00). The current study was restricted to practices that had switched to using the READ coding system. We reviewed the patients with a diagnostic code indicative of ADD and included only those who had at least 12 months of recorded history prior to the diagnosis. A review of children with first-time diagnosis of ADD revealed that about 90% were boys and about 80% with this diagnosis were treated with methylphenidate and/or dexamphetamine, starting in mid-1995. Given the uncertainty and varied symptoms that relate to this diagnosis, we chose to include only boys aged 5–14 years who were treated with psychostimulant drugs as 'cases' of ADD.

Incidence rates were calculated for the years 1996–2001. (Fewer than 5 boys per year were treated with psychostimulants prior to 1995.) Person-time in years was estimated as the number of boys of the relevant age who were present in the practice for at least 12 months prior to July of the year of diagnosis. The prevalence was calculated as the number of users of methylphenidate divided by the number of boys included in the study registered in participating practices in 1999.

Results

The study encompassed 457 boys aged 5–14 years, treated with methylphenidate and/or dexamphetamine, and considered to have ADD. The age distribution of the cases is provided in Table 1, together with age-specific estimated incidence rates. The peak incidence was in 9- to 10-year-olds. The distribution of diagnosed incident cases by calendar time (1996–2001) is provided in Table 2. There is little evidence that there has been an important change over the years of study. The prevalence of treated ADD was estimated to be 5.3 per 1000 boys in 1999.

In all of the cases patients received treatment with methylphenidate, by definition. There were 24 cases (5%) in which patients also received dexamphetamine, all of whom had prior prescriptions for methylphenidate.

Among the cases, 89% received continuous treatment for more than 6 months. No serious acute adverse effects were noted on the computer record.

Table 1. Incidence (IR) of treated attention deficit disorder by age for males aged 5–14 years (1996–2001).

Age (years)	Number of cases	Person-years	IR x 10^{-3} (95% CI)
5–6	71	72282	1.0 (0.8 to 1.2)
7–8	113	72995	1.5 (1.3 to 1.9)
9–10	119	67089	1.8 (1.5 to 2.1)
11–12	95	62385	1.5 (1.2 to 1.9)
13–14	59	60187	1.0 (0.7 to 1.3)

Table 2. Incidence (IR) of treated attention deficit disorder by calendar year for males aged 5–14 years.

Year	Number of cases	Person-years	IR x 10^{-3} (95% CI)
1996	82	70181	1.2 (0.9 to 1.5)
1997	97	69419	1.4 (1.1 to 1.7)
1998	89	67722	1.3 (1.1 to 1.6)
1999	103	63486	1.6 (1.3 to 2.0)
2000[a]	72	53130	1.4 (1.1 to 1.7)
2001[a]	14	11000	1.3 (0.7 to 2.1)

[a]A number of practices were updated only through 1999.

Discussion

The epidemiology of the clinical syndrome commonly referred to as ADD, is strikingly different in the UK compared with the epidemiology in North America, as judged from its treatment. While treatment with stimulant drugs started to increase from a very low level in the mid-90s in the UK, drug treatment in the US has been common for many decades.

The prevalence of drug-treated ADD in 1999 in the UK, based on our data, was estimated to be 5.3 per 1000 boys in the age group studied. By contrast, data available to us from a health maintenance organisation on the west coast of the US shows that the prevalence (as defined in the current study) of drug-treated ADD in boys 5–14 years of age treated with methylphenidate in 1995 was 93 per 1000 (unpublished data), similar to that previously provided by Guevara and Stein,[4] and Cox *et al*.[14] It is apparent from the information presented here that the diagnosis and drug treatment of ADD is far less common in the UK. The explanation for this major difference among countries was not evident from the available data.

The current study provides indirect evidence to suggest that treatment of ADD with psychostimulants in the UK is efficacious and safe in a substantial proportion of boys with ADD since these treatments were continued for at least 6 months in almost 90% of cases. Further studies will hopefully provide additional knowledge concerning the criteria for diagnosis and treatment of this disorder in the UK.

It is noteworthy that the incidence of treated ADD over the past 7 years has been relatively stable at a time when the incidence of diagnosed autism has been rising dramatically.[7] Thus, the increased incidence of autism cannot be attributed to a general increase in the diagnosis of childhood behavioural disorders per se, although changing criteria for the diagnosis of autism, in particular, cannot be ruled out.

References

1. Goldman LS, Genel M, Bezman RJ, Slanetz PJ. Diagnosis and treatment of attention-deficit/hyperactivity disorder in children and adolescents. *JAMA* 1998; **279:** 1100-1107.
2. Elia J, Ambrosini PJ, Rapoport JL. Treatment of attention-deficit hyperactivity disorder. *N Engl J Med* 1999; **340:** 780-788.
3. Green M, Wong M, Atkins D, *et al. Diagnosis of attention-deficit/hyperactivity disorder: Technical Review 3*. Rockville, MD: US Department of Health and Human Services, Agency for Health Care Policy and Research; 1999. (Agency for Health Care Policy and Research publication 99-0050.)
4. Guevara JP, Stein MT. Evidence-based management of attention deficit hyperactivity disorder. *BMJ* 2001; **323:** 1232-1235.
5. Cosgrove PVF. Attention deficit hyperactivity disorder: a review. *Primary Care Psychiatry* 1997; **3:** 101-113.
6. Thapar AK, Thapar A. Attention-deficit hyperactivity disorder. *Br J Gen Pract* 2003; **53:** 225-230.
7. Mayor S. Warning against overuse of drugs for inattentive children *BMJ* 1996; **313:** 770.
8. Kaye JA, del Mar Melero-Montes M, Jick H. Mumps, measles, and rubella vaccine and the incidence of autism recorded by general practitioners: a time-trend analysis. *BMJ* 2001; **322:** 460-463.
9. Madsen KM, Hviid A, Vestergaard M, *et al*. A population-based study of measles, mumps, and rubella vaccination and autism. *N Engl J Med* 2002; **347:** 1477-1482.
10. Yeargin-Allsopp M, Rice C, Karapurkar T, *et al*. Prevalence of autism in a US metropolitan area. *JAMA* 2003; **289:** 49-55.
11. Turnbull SJ, Ward A, Treasure JL, *et al*. The demand for eating disorder care. An epidemiological study using the general practice research database. *Br J Psychiatry* 1996; **169:** 705-712.
12. Meier CR, Napalkov PN, Wegmuller Y, *et al*. A population-based study on incidence, risk factors, clinical complications and drug utilisation associated with influenza in the United Kingdom. *Eur J Clin Microbiol Infect Dis* 2000; **19:** 834-842.
13. Kaye JA, Derby LE, del Mar Melero-Montes M, *et al*. The incidence of breast cancer in the general practice research database compared with national cancer registration data. *Br J Cancer* 2000; **83:** 1556-1558.
14. Cox ER, Motheral BR, Henderson RR, Mager D. Geographic variation in the prevalence of stimulant medication use among children 5 to 14 years old: results from a commercially insured US sample. *Pediatrics* 2003; **111:** 237-243.

Acknowledgements

We are indebted to the general practitioners who contribute information to the GPRD for their continuing effort and cooperation.