ARE CHILDREN AND YOUTHS WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER (ADHD) ACCIDENT PRONE?

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- NO CONFLICT OF INTEREST-

Background

Injuries and poisonings are a significant health problem in children and youths causing many hospital admissions, long-lasting functional limitations and deaths. Attention-Deficit / Hyper-activity Disorder (ADHD) is generally accepted to be associated with an increased risk of injury. Recent studies from Canada, USA and Great Britain support this hypothesis (1, 2, 4, 5).

Objectives

To determine rate ratios of hospital admissions for injuries and poisonings for children and youths with and without ADHD. To validate the use of stimulant prescription as an indicator for ADHD.

Methods

A cohort study of 334 423 persons aged 6 to 18 years using records of a German statutory health insurance, Gmuender Ersatzkasse (GEK). The diagnosis ADHD was assigned if at least one stimulant prescription was registered during the study period from 2000 to 2002. Hospital admission rates for injuries and poisonings and rate ratios were calculated using a Poisson model. ADHD as indicated by stimulant prescription, age, period and region of residence were included in the model.

Model: ACCIDENT=ADHD AGE PERIOD REGION

Interactions between stimulant prescription and the other main variables were tested for significance. Hospital admissions with ADHD as a primary or secondary diagnosis were used to determine the sensitivity of stimulant prescription with respect to ADHD. Using a positive predictive value of 90% found in the literature (1, 3, 6) the prevalence of ADHD and the specificity of stimulant prescription were calculated.

Results

Injuries and poisonings caused 21.8% of all hospital admissions for boys in this cohort (Fig.2). The rate ratio for boys with compared to those without stimulant prescription was 1.40 for injuries and poisonings, for head injuries the rate ratio was 1.79. 14.6% of all hospital admissions in girls were due to injuries and poisonings. The rate ratio for girls with ADHD was 1.28, but it was not significantly raised compared to girls without ADHD (Table 1).
A significant interaction (p<0,01) was found for stimulant prescription and region (Fig.3).
Model: ACCIDENT=
ADHD ADHD*REGION AGE PERIOD REGION

The sensitivity of stimulant prescription with respect to the diagnosis ADHD was 66.4% in boys and 50.5% in girls. The prevalence of ADHD was calculated to be 4.3% in boys and 1.3% in girls. The specificity of stimulant prescription in boys is 99.7% and in girls 99.9%.

Fig.1:
Regional Variation in the Prevalence of Stimulant Prescription to 6 – 18 year old Males in Germany (percentage of cohort members, overall average= 2.49%)

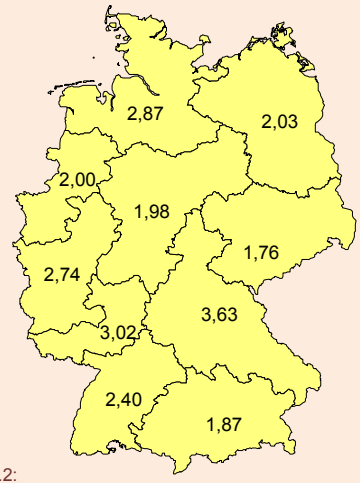


Fig.2:
Hospital Admissions for Injuries and Poisonings in 6 - 18 year old Male Cohort Members with/without Stimulant Prescription 2000 - 2002

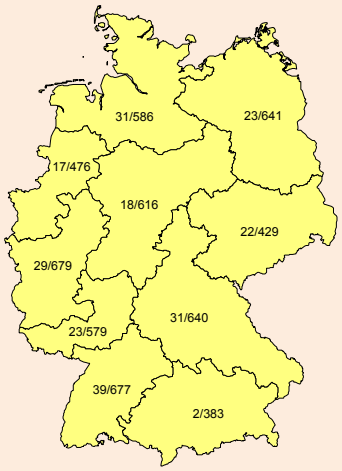
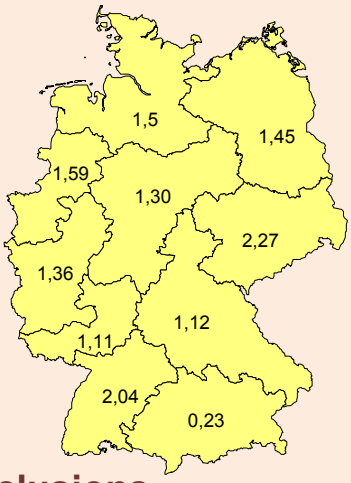


Table 1:
Rate Ratio for Hospital Admissions due to Injuries and Poisonings for Cohort Members with Stimulant Prescription as an indicator for ADHD

Hospital Admission for	Rate Ratio	95% CI
Injuries and poisonings in males	1.40	1.23 – 1.59
Injuries in males	1.39	1.21 – 1.60
Head injuries in males	1.79	1.45 – 2.20
Injuries and poisonings in females	1.28	0.90 – 1.81

Fig.3:
Interaction ADHD*Region in Males: Risk of Hospital Admission for Injuries and Poisonings compared to Cohort Members without ADHD living in the same Region (p < 0.01 for interaction)



Conclusions

Boys with a diagnosis of ADHD as indicated by stimulant prescription are admitted more frequently to hospital due to injuries and poisonings, especially injuries of the head. Preventive strategies should be included in the routine care of these children.
The regional variation in the prevalence of stimulant prescription (Fig.1) as well as the interaction between region of residence and stimulant prescription (Fig.3) indicate that different standards of diagnosis and / or treatment of ADHD are implemented in different parts of Germany.
Stimulant prescription is considered a valid indicator for ADHD with moderate sensitivity and high specificity.

References

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