

Recent Trends in the Burden of Alcohol Intoxication on Pediatric In-Patient Services in Germany

Stationäre Aufnahmen von Kindern und Jugendlichen aufgrund von Alkoholintoxikationen in Deutschland in den Jahren 2000–2002

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Key words

- Alcohol intoxication
- children
- adolescents
- gender
- in-patient treatment

Schlüsselwörter

- Alkoholintoxikation
- Kinder
- Jugendliche
- Geschlechterverteilung
- stationäre Behandlung

Bibliography

DOI 10.1055/s-2007-972566

Published online

December 20 2007

Klin Pädiatr 2008; 220: 6–9

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Stuttgart · New York

ISSN 0300-8630

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Abstract



Aims: To elicit data on alcohol intoxications requiring in-patient treatment in children and adolescents in Germany between 2000 and 2002.

Design and participants: An ex-post analysis was performed to assess the number of children and adolescents (age 10–17 years) with acute alcohol intoxications requiring in-patient hospital treatment (≥ 24 hours).

Setting: 22 major children hospitals in Germany.

Findings: The number of acute alcohol intoxications requiring in-patient treatment increased from 227 in 2000 to 313 in 2001 (+37.9%; $p^* < .01$) and 350 in 2002 (+10.6%; $p^* < .05$). 10–12 year-old children comprised 2.2%, adolescents aged 13–14 years 28.6%, and adolescents aged 15–17 years 69.2% of the study population. The most significant increase was seen in adolescents aged 13–14 years (2001: +35.9%, and 2002: +19.3%; $p^* < .05$), and 15–17 years (2001: +59.1%, and 2002: +10.1%; $p^* < .05$). The percentage of female patients increased from 34.1% in 2000 to 41.9% in 2001 and 49.8% in 2002 ($p^* < .05$). Mean time spent in the hospital was 1.7 days (range: 1 day–>4 days).

Discussion and conclusions: This is one of the very few studies that provide epidemiological data on the specific issue of alcohol intoxications in children and adolescents that require in-patient treatment. Apparently, gender differences seem to play a minor role in alcohol-related hospital admissions. Our data demonstrate that excessive alcohol consumption remains an issue of concern in this age cohort.

Zusammenfassung



Fragestellung: Ziel dieser Untersuchung war es, Daten bezüglich Alkoholintoxikationen bei Kindern und Jugendlichen, welche eine stationäre Aufnahme (≥ 24 Stunden) erforderten, für den Zeitraum 2000–2002 in Deutschland zu erheben.

Patienten und Methode: Es wurde eine post-hoc Analyse durchgeführt, um die Anzahl der Kinder und Jugendlichen (Alter: 10–17 Jahre) zu erfassen, die in 22 großen deutschen Kinderkliniken aufgrund einer Alkoholintoxikation stationär behandelt werden mussten.

Ergebnisse: Die Anzahl der aufgrund einer akuten Alkoholintoxikation stationär behandelten Kinder und Jugendlichen stieg von 227 Patienten im Jahr 2000 auf 313 im Jahr 2001 (+37,9%; $p^* < .01$) und 350 im Jahr 2002 an (+10,6%; $p^* < .05$). 10–12-Jährige machten 2,2%, 13–14-Jährige 28,6% und 15–17-Jährige 69,2% des Patientenkollektivs aus. Der stärkste Anstieg war bei Jugendlichen im Alter von 13–14 Jahren (2001: +35,9%; 2002: +19,3%; $p^* < .05$), und 15–17 Jahren (2001: +59,1%; 2002: +10,1%; $p^* < .05$) festzustellen. Der Anteil der weiblichen Patienten stieg von 34,1% im Jahr 2000 auf 41,9% im Jahr 2001 und 49,8% im Jahr 2002 an ($p^* < .05$). Die mittlere stationäre Verweildauer betrug 1,7 Tage (Spanne: 1 Tag–>4 Tage).

Diskussion: Dies ist eine der wenigen Studien, die epidemiologische Daten zur Häufigkeit von Alkoholvergiftungen bei Kindern und Jugendlichen, welche eine stationäre Behandlung erforderten, präsentiert. Unsere Ergebnisse deuten darauf hin, dass exzessiver Alkoholkonsum weiterhin ein Problem bei Kindern und Jugendlichen darstellt. Unsere Ergebnisse zeigen zudem, dass zunehmend auch Mädchen zu problematischem Trinkverhalten neigen.

Introduction

As alcohol consumption in the population as whole is increasing steadily in many countries, the deleterious effects of alcohol on the individual and society are increasingly being recognised. Alcohol consumption and abuse in the young and in school children also seems to be on the rise. Of concern, data from the United States indicate that children of an increasingly younger age are consuming alcohol, and a substantive proportion of adolescents have difficulties with alcohol intoxication, self-poisoning or dependence [1–4]. In Australia, 90% of teenagers aged 15 to 16 years report having drunk more than two alcoholic beverages in their lifetime, and 29% describe drinking to the point of intoxication [5]. Similar data is available for European countries [6–8]. This is likely to lead to the development of alcohol dependence at an earlier age in a proportion of young drinkers, and the subsequent development of physical complications [9], thus increasing the burden of alcohol-related illnesses on the health-care system. As a consequence, reduction of alcohol consumption is one of the health priorities of the WHO [10–12].

However, despite the increasing data on various aspects related to alcohol abuse in children and adolescents, there is a paucity of information on its effects on the use of accident and emergency departments and in-patient services in this age cohort [13–14]. Most of these studies have been relatively small, took place at least a decade ago, or have solely focussed on the burden of accident and emergency departments. To address the specific issue of alcohol-related in-patient treatment, we undertook a post-ex analysis over a 3-year study period (2000–2002) to assess recent trends in the number of children and adolescents requiring in-patient hospital treatment for acute alcohol intoxication in Germany.

Participants and Methods

The study was conducted in accordance with the Helsinki Declaration as revised in 1983 and after approval of our Institutional Review Board (IRB). Based on a list of hospitals provided by the federal Ministries of Health, 42 children's hospitals were contacted and asked to participate in the survey. Hospitals that did not provide complete data sets for the years 2000–2002 were excluded from data entry. Twenty-two out of 42 hospitals (52.3%) provided complete data on children and adolescents requiring in-patient treatment secondary to acute alcohol intoxication, and were subsequently enrolled in the study (● Fig. 1). We then conducted a post-ex analysis of children and adolescents who presented with alcohol intoxication to the enrolled children's hospitals in Germany from January 1, 2000, to December 31, 2002. The children requiring in-patient treatment were identified using *International Classification of Diseases, Tenth Revision (ICD-10; F10.0/1 + T51.9)* [15] codes for "alcohol intoxication" and "self-poisoning, alcohol" based on documented history, clinical assessment, and/or blood alcohol levels. The indication for hospital admission was based on clinical grounds and included among other reasons depression of consciousness, profound emesis, volume depletion, hypoglycaemia, metabolic acidois, and lack of adequate parental monitoring/supervision at home.

Patients were excluded if their presentation with acute alcohol intoxication/self-poisoning occurred in the context of an overdose of other substances or other forms of deliberate self-harm.

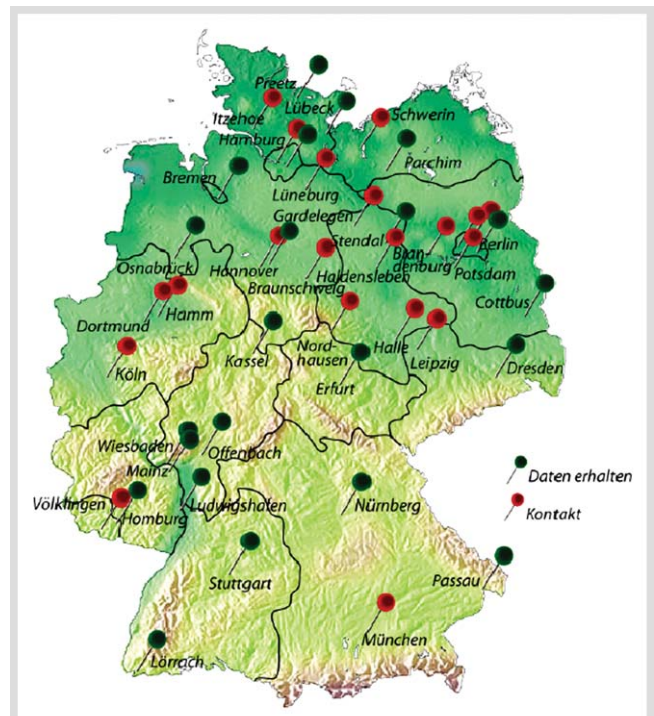


Fig. 1 Graphic illustration of all hospitals that were asked to participate in the study and participating (providing complete data sets) hospitals. Legend: Hospitals that were contacted for survey data collection (42, in red); hospitals that participated in the study and provided data for the survey (22, in green).

Medical records were then manually searched to confirm that the child or adolescent had indeed presented with "acute alcohol intoxication/self-poisoning." Information studied included age, gender, and length of hospital stay.

Statistical analysis

Statistical analysis was performed using SPSS (SPSS 10.0, SPSS Inc., Chicago, IL). For statistical comparison the *Wilcoxon signed rank test* was employed. A *p* value of $< .05$ was considered statistically significant.

Results

A total of twenty-two children's hospital (52.3%) provided complete data for the study period 01/2000–12/2002. The two main reasons for hospitals not being included into the study were: provision of incomplete data sets, and failure to respond to the survey. The participant and non-participant hospitals did not differ with regard to location of the hospital, population served, and number of out-patients and annual in-patient admissions. The overall number of in-patient admissions in the 22 hospitals remained statistically unchanged during the study period.

During the observation period from 01/2000 until 12/2002, a total of 790 children and adolescents were admitted to in-patient pediatric services due to acute alcohol intoxications in. During the 3-year study period, there was an increase from 227 admissions in 2000 to 313 in 2001 (+37.9%; $p^* < .01$) and 350 admissions in 2002 (+10.6%; $p^* < .05$). The overall age distribution of the affected patients was as followed: 10–12 years: 2.2%; 13–14 years: 28.6%; 15–17 years: 69.2%.

During the study period, the most notable rise in the number of patients admitted to the hospital was seen in the age group 13–14 years (2001: +35.9%, and 2002: +19.3%; $p^* < .05$), and 15–17 years (2001: +59.1%, and 2002: +10.1%; $p^* < .05$). In the age group of 10–12 years, the number of children requiring in-patient treatment decreased over the study period (2001: –33%, and 2002: –25%).

Interestingly, in our study more and more female patients required hospital admission resulting in an almost even number of males and females being treated for acute alcohol intoxication in the year 2002, i.e. the percentage of female patients increased from 34.1% in 2000 to 41.9% in 2001 and 49.8% in 2002 ($p^* < .05$). • **Table 1** depicts the gender ratio for the age group of 10–14 years and 15–17 years during the observation period.

The mean length of the hospital stay was 1.69 days with a modest increase during the study period (2000: 1.6 days; 2001: 1.7 days; 2002: 1.8 days). • **Fig. 2** demonstrates the length of hospital stay in the years 2000–2002. Since we did not measure blood alcohol concentrations in the whole study cohort, we could not correlate the length of stay to the blood alcohol concentration.

Discussion

Health care professionals must be able to identify children or adolescents who are having difficulties with alcohol abuse or dependence. This problem may come to their attention when a child or adolescent with acute alcohol intoxication or self-poisoning presents to an emergency department, or other health care facilities [16]. While some data exists on the number of children and adolescents presenting to emergency departments [12, 14], scant data are available on the number of pediatric patients requiring in-patient treatment ≥ 24 hours secondary to alcohol intoxication.

Our results show that the number of alcohol-intoxicated children and adolescents increased significantly in the years 2000–2002, the most prominent increase being seen in adolescents aged 13–17 years, and female patients. Neither a rise in population and hospital admissions nor a change in age structure of the population studied is likely to account for this increase. Since the ICD-10 was uniformly used for the time of the study period, it is also unlikely that better recording or coding of acute alcohol diagnoses over time could explain the increase. In fact, incorrect coding may well have resulted in an overall underestimate of the true number of children and adolescents with acute alcohol intoxication. In addition, the increase in recorded acute alcohol intoxication admissions in our survey corresponds to an increase in alcohol consumption levels that has occurred over the same time period in children and adolescents in Germany as reported by the German Federal Centre for Health Education [17]. The high proportion of females in our study is in accordance with previous reports [13], and probably mirrors real changes in drinking patterns in girls.

Since our survey was largely based on the data of representative children's hospitals in Germany, the chosen hospitals represented an area of mixed social classes. Although, it is reasonable to assume that the patterns seen in our 22 children's hospital are likely to reflect common patterns and trends in Germany of children and adolescents requiring in-patient treatment due to acute alcohol intoxications, some distortion in admission numbers cannot be completely ruled out. In particular, our data may be biased by an exclusion of almost 50% of the total number of contacted hospitals. However, no substantial differences between the participant and non-participant hospitals was noticed with regard to location, population served, and the annual number of out- and in-patients treated.

Since measuring of alcohol blood level was not a pre-requisite entry criterion in this study, recording of acute alcohol intoxication on the patient chart was used in this study as an indirect measure of patients who were alcohol-intoxicated on admission. Although subjects were excluded if their presentation with acute alcohol intoxication/self-poisoning occurred in the context of an overdose of other substances or other forms of deliberate self-harm, the erroneous inclusion of subjects without significant alcohol intoxication and simultaneous drug consumption cannot be completely ruled out.

In our study there was a tendency for longer in-patient hospital stay over the 3-year study period which could possibly be explained by an increase in disease severity (• **Fig. 2**). The overall average length of stay was 1.7 day, which is shorter than the mean length of stay reported in adults (2.7 days) [14].

The troubling aspects of the findings of our study are corroborated by the results from previous reports that have also demonstrated a substantial proportion of under-age drinkers seen in the accident and emergency departments [13]. In the study by O'Farrell et al. almost 10% of all hospital admissions for acute alcohol intoxication were under 18 years of age, and 3% were

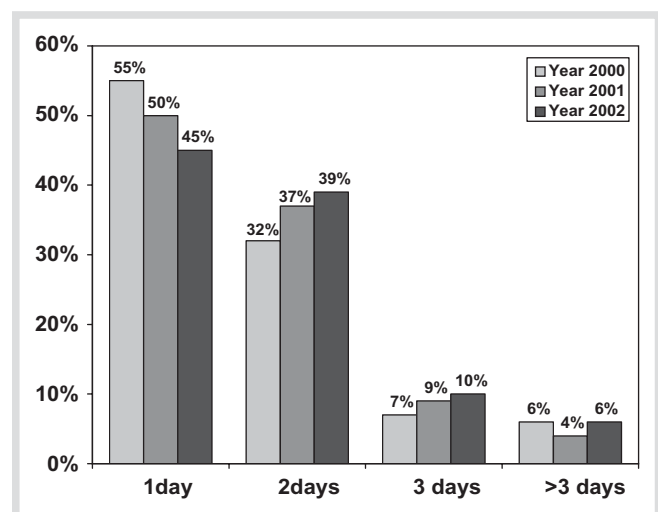


Fig. 2 Length of hospital stay (in days) between 2000 and 2002.

Table 1 Proportion of children and adolescents who required in-patient treatment between 01/2000–12/2002 according to age and gender

Gender	2000		2001		2002	
	Male	Female	Male	Female	Male	Female
10–14 years	62%	38%	60%	40%	49%	51%
15–17 years	58%	42%	60%	40%	51%	49%

aged 10–14 years [14]. In Germany, in the year 2000 the overall rate of hospital admissions in children and adolescents aged 10–17 years secondary to acute alcohol intoxication was estimated to be 1 ‰ [18].

Besides the ready availability of alcohol beverages to our young population, the increase demonstrated in our study could possibly be related to a high prevalence of binge drinking seen among younger age groups [19–20]. However, a short-coming of our study was that we did not assess the day of week of admission; thus the suggested high prevalence of binge drinking which usually occurs on week-ends remains somewhat speculative. Nevertheless, effective legislative measures to tackle the pattern of binge drinking as well as policies regulating availability through access, pricing and promotion, as recommended by various task forces on Alcohol [11,21] are required to minimize the harmful affects of alcohol within this specific age cohort. Although not assessed in our study, it is also very important to take into consideration underlying risk factors for alcohol abuse in this age cohort, e.g. psychosocial problems, history of physical and/or sexual abuse [22–24].

The problem of drinking in children and adolescents requires the development and implementation of short-term and long-term intervention strategies in order to prevent acute injury and the development of alcohol dependence at an early age. In accordance with current pediatric and psychiatric literature it is recommended that once the child or adolescent presenting to the hospital with acute alcohol intoxication is medically stable, mental health and drug and alcohol issues (comprehensive assessment of alcohol and drug history, psychosocial risk factors, and treatment history) be explored and appropriate follow-up arranged [4,25]. Although a large proportion of health promotion needs to be performed in primary care, hospitals and emergency departments can deliver effective early interventions [26]. Although the age group of 13–17 year-old children and adolescents may represent a cohort which may be especially amenable to such interventions, often comprehensive assessment and adequate follow-up are not performed in the emergency department [13]. The employment of key personnel (e.g., alcohol specialist nurses trained in alcohol-related problems) and the implementation of effective referral pathways to adolescent mental health and alcohol services might be a promising approach to cope with the burden posed by alcohol intoxication in this age group on hospitals. Once realised, these intervention measures then mandate ongoing assessment as to whether they improve the outcomes of this group of children and adolescents.

Conflict of interest: The authors have no conflict of interest to disclose.

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