ORIGINAL ARTICLE

Children presenting to hospital with acute alcohol intoxication

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Aims: To investigate the problem of children presenting to hospital with alcohol intoxication.**Methods:** An observational study was conducted over 18 months profiling children who presented to hospital with acute alcohol intoxication, proved by laboratory tests on blood alcohol levels (BALs). The study was part of a multicentre-funded injury prevention project based on the widely accepted Canadian Hospital Injury Reporting and Prevention Programme.**Results:** 62 children (31 boys), mean age 14.5 years, presented with alcohol intoxication proved by BALs. The mean BAL was 203 mg/dl (standard deviation (SD) 80.7). As a point of reference, 56 (90%) children had BAL above the UK legal driving limit of 80 mg/dl. The most common type of alcohol consumed was spirits, in the form of whisky, gin, vodka and tequila. No significant association was seen between age and BAL. Children with high alcohol levels were much more likely to have lower Glasgow Coma Scores ($p < 0.001$), but in contrast with conventional teaching, there was no association between blood glucose levels and BALs. The median Glasgow Coma Score on admission to the emergency department was 12. 15 (24%) children had a score $\leq 8/15$. Injuries were present in 21 (34%) children, most of which were minor injuries. Minor head injury was most common, accounting for 42% of the injuries. The most common cause of injury was a fall.**Discussion:** The results of this study confirm the heavy use of alcohol by some young children. This highlights a definite problem, which needs to be dealt with by a variety of measures, giving particular consideration to the ease of access to alcohol by children.

The relationship between alcohol misuse and attendance in the emergency department is well established for adults.¹ In adults there is also a clear correlation between alcohol misuse and severity of injury.²⁻⁴ However, little is known about alcohol misuse and mechanisms of injury in children.⁵ Children in the UK are reported to have the highest rates of drunkenness, binge drinking and alcohol consumption in Europe.⁶ Although deaths in children from the toxic effects of alcohol are rare, co-morbidity is positively correlated with risk-taking behaviours such as substance misuse, criminal activity, depression, suicide, conduct disorder, early pregnancy, poor educational attainment and unemployment.⁷ The purpose of this study is to profile children presenting to the emergency department with acute alcohol intoxication proved by blood alcohol levels (BALs). This may facilitate the implementation of effective intervention and preventive strategies to reduce alcohol-related injury and comorbidity.

METHODS

An observational study was conducted over a period of 18 months in the emergency department of the Royal Cornwall Hospital, Truro, Cornwall, investigating children aged <17 years who presented with acute alcohol intoxication, proved by laboratory BAL. The project is part of a multicentre-funded injury prevention programme based on the widely accepted emergency department-based injury surveillance system, Canadian Hospital Injury Reporting and Prevention Programme (CHIRPP).⁸ Ethical approval was obtained. Only those children who had positive BAL were included in the study. The measurement of BAL was entirely at the clinician's discretion and was based on a definite history of acute alcohol use or clinical signs of acute alcohol intoxication. Oral consent to check BAL was obtained from the child's parents if they were present. Children who

presented with a decreased Glasgow Coma Score (GCS) of unknown aetiology had BAL checked as part of standard patient care. Paramedic, emergency department and medical records were analysed.

RESULTS

Sixty two children (31 boys) presented with acute alcohol intoxication proved by BALs. All patients were admitted to hospital. The mean age was 14.5 years (standard deviation (SD) 1.54; fig 1). Twenty (32%) children were aged <14 years. No significant difference was seen between BAL among boys and girls ($p = 0.76$). Forty five (73%) children

Figure 1 Ages of children presenting to hospital with alcohol intoxication.

Abbreviations: BAL, blood alcohol level; CHIRPP, Canadian Hospital Injury Reporting and Prevention Programme; GCS, Glasgow Coma Score

Figure 2 Blood alcohols levels in children presenting to hospital with alcohol intoxication (The UK legal driving limit is 80 mg/dl).

were brought to the emergency department by the ambulance services, the remainder by their parents or guardians. The most common type of alcohol consumed was spirits, in the form of whisky, gin, vodka and tequila (50%). Other types included cider (8%), wine (4%) and beer (3%), with 35% not specified or unknown. The mean BAL was 203 mg/dl (SD 80.7; range 27.6–418.6; fig 2). As a point of reference, 56 (90%) children had BAL above the UK legal driving limit of 80 mg/dl. No significant association was found between age and BALs (Spearman's $r = 0.24$, $p > 0.06$). The GCS was not documented in the notes of seven patients. The median GCS on admission to the emergency department was 12. Fifteen (24%) children had GCS scores $\leq 8/15$. Children with high alcohol levels were much more likely to have lower GCS scores ($p < 0.001$). The checking of blood sugar levels with a glucometer test is routine policy in the emergency department. The result was, however, recorded only in the clinical notes in 39 (70%) patients. No child had hypoglycaemia on admission.

Data about injury were not known or not documented in six patients. Twenty one (34%) children sustained an injury. All injuries were minor except two: one child sustained a fracture of the humerus from punching a mirror and one child sustained an injury due to water inhalation from swimming in a harbour. Minor head injury was most common, accounting for 42% of the injuries. The rest of the injuries were minor abrasions, contusions and lacerations. In all patients, excluding the two mentioned above, the cause of injury was a fall. Three children required paediatric high dependency and intensive care monitoring. None required intubation or ventilation. No patient required a computed tomography scan of the head. Fifty one (82%) children had

Figure 3 Glasgow Coma Scores of children presenting to hospital with alcohol intoxication.

no documented counselling before discharge from the emergency department.

DISCUSSION

The results of this study confirm the heavy use of alcohol by some young children. The drinking characteristics of our sample population were similar to those in adults, with spirits being the most common type of alcohol consumed. Designer drinks (alcopops), beer, lager and cider seem to be less of a cause for concern, as previously reported.⁹ Our study found no association between acute alcohol intoxication and severity of injury, which contrasts with other studies in adolescents where alcohol misuse correlated well with severity of injury.^{10–12} This study also contrasts strongly with data from adults, where there is a clear correlation between alcohol misuse and severity of injury.^{2–4} This may be attributed to children having less access to unlimited quantities of alcohol, drinking at home or being more likely to be brought into the emergency department by an adult before an injury can occur.

A strong correlation was found between BAL and GCS scores, but, in contrast with conventional teaching, there was no association between blood glucose levels and BALs. A universal requesting of BAL must be considered for children presenting with a reduced level of consciousness. However, other reasons for a decreased GCS must also be excluded at the same time. For the intoxicated child with hypoglycaemia, causes other than alcohol must be considered, such as infection, poisons, toxins and other drug ingestion (including glue sniffing). A low, or zero, alcohol level is a good rule out. A high alcohol level is not a rule in—that is, it may well not be the sole cause of the child's presentation. Doctors and nurses may have concerns about BAL being taken without prior consent. Therefore, where possible, oral consent for ordering BAL should be obtained from the parent. However, in an emergency situation (eg, reduced GCS or hypoglycaemia of unknown aetiology), BAL should be routinely carried out in order not to compromise patient care and delay appropriate medical treatment.

The resources required to manage children who present with alcohol intoxication are noteworthy: most children were brought to the emergency department by the ambulance services; all children required a prolonged observation period or hospital admission, possibly to a paediatric high dependency or intensive care unit. This study therefore highlights a major problem that needs to be dealt with by a variety of measures, giving particular consideration to the ease of access to alcohol by children. The UK government, regrettably, is unlikely to respond by increasing the costs and decreasing the availability of cheap alcohol; nor is it likely to limit advertising and marketing of strong designer drinks, or even lower the legal BAL for driving.¹³ Therefore, widespread availability and use of brief intervention is the most appropriate way forward to treat and prevent alcohol misuse in children. Educational programmes need to be implemented by local health authorities at school level; however, the emergency department should also take a public health and interventional role in implementing alcohol screening tests and initiating intervention programmes.

Emergency departments are well placed to identify alcohol misuse.¹⁴ Opportunist identification and referral for alcohol misuse in the emergency department is feasible, associated with lower levels of alcohol consumption, and reduces re-attendance to the department.¹⁵ It provides a prime opportunity for tackling the individual health needs of children who present with alcohol-related problems. Admission may be a “teachable moment”, where children may be more responsive and receptive to an intervention strategy.¹⁶ Our study showed that 51 (82%) of the children received no

documented or formal counselling on discharge from the emergency department. Increasing success is seen in the use of brief motivational interventions designed to assist patients with problems related to alcohol misuse or mild symptoms of alcohol dependency to reduce or eliminate their alcohol consumption.¹⁷⁻¹⁹ Doctors in emergency departments must play an active part in developing optimal strategies that include screening protocols, management strategies, counselling and intervention support before the patient's discharge, so that adverse long-term consequences can be prevented.

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