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Non-Medicinal Poisoning in Queensland Adolescents

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Summary

- 212 children aged 10 to 16 presented to participating ED's in Queensland as a result of non-medical poisoning
- Alcohol and volatile substances were the most frequent agent used
- The peak age for poisoning was 13 years
- 10% of poisonings were deliberate self-harm
- More than half of volatile substance poisonings involved paint, followed by glue and petrol

Introduction

Poisoning with non-medicinal substances is prevalent amongst adolescents in Queensland[1]. In contrast to poisoning in younger children, exposure to poisonous substances in this group is often an intentional act. Motivation includes experimentation with substances that will give a "high" and self-harm. Substances used include alcohol, volatile substances (petrol, paint, glue), street drugs (marijuana, amphetamines, narcotics) and plant substances (mushrooms, Datura). In contrast to adults, adolescents tend to use cheap accessible substances (alcohol, paint and glue). Data from the National Drug Strategy Household (NDSH) Survey 2004 conducted by the AIHW showed that 17% of children aged between 12 and 17 years had used illicit drugs on at least one occasion[2]. The type of substance used varies according to age and setting (rural versus urban). Community based research in Queensland shows that up to 10% of children in years 7 and 8 have used volatile substances in the last week with the rate falling to 1% in year 11 students[3]. Emergency department data reflects a small but significant group of adolescents with non-medicinal poisoning. Presentation to the emergency department usually occurs when there are significant behaviour/psychiatric concerns or altered level of consciousness and therefore reflects the more severe end of the spectrum.

Methods

Emergency Department injury presentations to QISU participating hospitals between 1998 and 2004 were searched to identify paediatric patients aged between 10 and 16 years of age who presented with non-medicinal poisoning.

QISU collects and analyses data from emergency department injury presentations on behalf of Queensland Health. Participating hospitals represent three distinct areas of Queensland.

QISU publications and data are available on request for research, prevention and education activities.

HOSPITALS:
Mater Children's, Mater Adult, Princess Alexandra, Redland, Logan, Royal Children's, Mount Isa , Mackay Base, Mackay Mater, Proserpine, Sarina, Clermont, Dysart, Moranbah and Mareeba.

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The database was searched for "external cause" and "nature of injury" codes of poisoning with non-medicinal substances. The data set excludes poisoning due to ingestions of prescription or over the counter medicinal compounds (with the exception of Ritalin and Dexamphetamine, prescription drugs that are sometimes traded for their psychogenic properties). Poisoning with recreational drugs (not intended for medicinal purposes) was identified by searching "poisoning- other drugs" in external cause.
Intent is coded for each injury presentation and was used to analyse those presentations where intent to cause self-harm was identified by emergency department staff.

Results

Between 1998 and the end of 2004 there were 212 children aged between 10 and 16 years who presented to QISU participating emergency departments for treatment of a non-medicinal poisoning. This group comprised 0.8% of all injury presentations to participating hospitals in this age group. In the same period, presentation due to poisoning with medicinal substances accounted for 1% of all injury presentations in this age group. The peak age for presentation for non-medicinal poisoning was 13 years (30%).
Results are presented according to the substance used (Figure 1).

Alcohol

Age and gender

During the study period 68 children presented to participating emergency departments because of acute alcohol poisoning. The most common age for presentation was 13 years (28%). The youngest child was 10 years old. Girls were only slightly more likely (53%) than boys to present for alcohol poisoning (Figure 2).

Place

The most common place for children to access alcohol was the in the home (47%) followed by schools (15%) and public parks (7%).

Severity

More than two thirds of the children presenting for treatment of an alcohol related injury had a triage category of urgent (requiring treatment in less than 30 minutes) or above (71%) and nearly half (43%) required admission to hospital.

Day and time

Children were most likely to present following poisoning with alcohol on a Saturday (30%) or Friday (28%) evening, most commonly between 8 and 11 PM.

Volatile Substances

Age and gender

Poisonings in this group included exposure to petrol, paint, glue. There were 73 poisonings in this category during the study period. The most common age for presentation in this group was 13 years (37%). Boys (63%) were more likely than girls to present to an emergency department following poisoning with a volatile substance (Figure 2).

Place

Nearly 1/3 (24) of these poisonings took place in the home (33%) followed by a public park (14%). The next largest groups inhaled their substances on urban roads (8%) or bus or railway stations (3%).

Agent

More than half (54%) of the children in this group inhaled paint. Other common substances used were glue (12%) and petrol (10%). Eighteen (24%) of the children using volatile substances

Figure 1: QISU ED presentations for adolescent non-medicinal poisoning by substance, 1998-2004

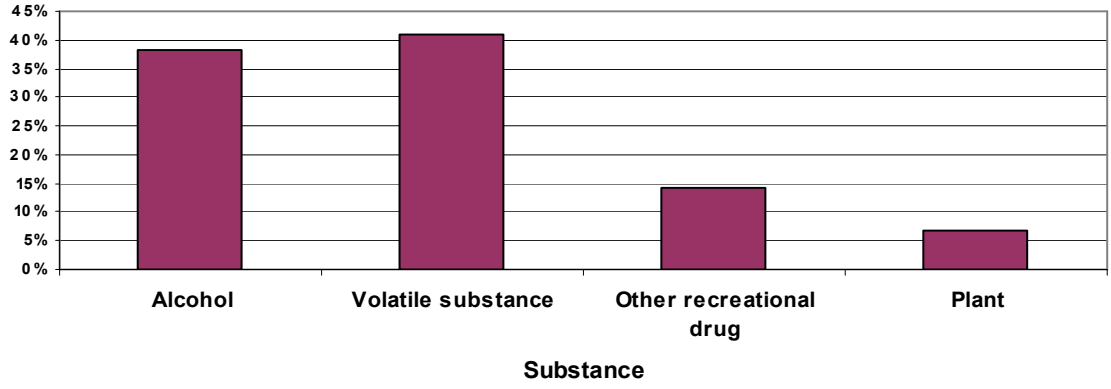
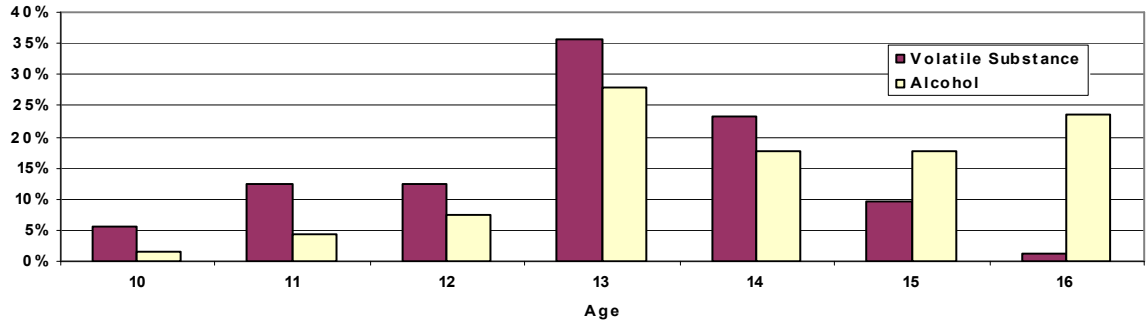


Figure 2: QISU ED Presentations for adolescent non-medicinal poisoning by age and substance, 1998-2004



were brought into the emergency department by police who found them wandering in public areas in a confused or disoriented state. There were 4 children who ingested alcohol at the same time as they were inhaling.

Severity

Sixty-three percent of children who presented following an inhalational poisoning had a triage category of urgent or above and 16% of were admitted to hospital for further treatment.

Day and time

There was no clear pattern for day or time of day for presentations due to inhalational poisoning.

Street drugs

Substances in this category include amphetamines, marijuana, and cocaine. Dexamphetamine and other amphetamine derivatives have been included as street drugs despite being available on prescription as they may be traded as such.

Age and gender

During the study period, 25 children presented following poisoning with street drugs. Girls slightly outnumbered boys (56%). 35% of the children were 15 years of age.

Agent

Poisonings in this group included exposure to intravenous amphetamines (2), hash oil (1), cocaine(1) and oral dexamphetamine tablets (4). Six children aged between 13 and 16 had smoked marijuana. There were no presentations with narcotic poisoning.

Place

The most common place for adolescents to ingest a recreational drug was the home (52%). However, 16% of children presented with poisonings that occurred at school during school hours. These children all presented from school following poisonings (dexamphetamine and marijuana) as part of a group of children.

Severity

Eighty-four percent of children presented with a triage category of urgent or above and 44% were admitted.

Day and time

Presentations tended to occur most frequently on a Friday (24%) and there was no clear pattern for time of day.

Hallucinogenic plants

Age and gender

During the study period, 12 children presented to the emergency department following poisoning with a plant substance. In this group, 75% were boys but numbers were small and 5 boys presented together with poisoning from the same incident and substance. There was no clear pattern for age.

Agent

Two children had drunk boiled Datura (Angel Trumpet flowers). Five children between the ages of 10 and 13 presented following the poisoning with candlenuts as a group. Four children presented following poisoning of unidentified plant substances. Interestingly, there were no presentations due to mushroom poisoning.

Place

The most common place for children to ingest plants was the home (33%).

Severity

Eighty-three percent of children presented with a triage category of urgent or above and 68% were admitted.

Day and time

There was no pattern for the day or time of presentation following poisoning.

Self-harm

During the study period there were 524 children between the ages of 10 and 16 years of age who presented to a participating emergency department with intentional self-harm. The majority of these (63%) were due to poisoning with a drug or medicinal substance, however, 7% (37) were due a non-medicinal poisoning. Other causes of self-harm were due to cutting/piercing (20%) or threat to breathing (4%). The substances children used for self-harm tended to be different from those used by adolescents not intending self-harm. Some of the presentations in this category have also been analysed in the preceding sections.

Age and gender

Girls outnumbered boys (60%). The most common ages were 14 and 15 (29%)

Place

The most common location for these poisonings is in the home (41%). There were 2 children who were brought in to the emergency department from the street by police.

Agent

Three children ingested insecticides, pesticides or other garden chemicals. Two children ingested tea tree oil or eucalyptus oil and two children inhaled paint/ fumes. There was one child who ingested a large amount of alcohol together with a small number of a prescription antidepressant.

Severity

Eighty-two percent of children (14) who ingested poison with the intent of self-harm had a triage category of urgent or above and 47% of this group were admitted to hospital.

Day and time

There was no clear pattern for presentation to an emergency department.

Discussion

Adolescents experiment with alcohol and drugs usually without intending to cause self-harm. Unintended adverse effects range from acute life threatening emergencies to long term psychological and physical impairment. Reasons behind this experimentation are complex but include peer pressure, risk seeking behaviour, boredom, and educational and employment difficulties.

Mental health issues may coexist with substance use and may predate and predispose the adolescent to substance use or be exacerbated by substance use[3].

The nature of experimenting with these substances means that adolescents are unlikely to self-present to emergency departments. Substance use tends to be secretive and a large proportion of users never come to acute medical attention. They are unlikely to be brought in by friends, family or police unless there is an acute alteration in level of consciousness or change in behaviour. In our data series, adolescents who had been using substances in public spaces were more likely to be presented for assessment in the emergency department by police rather than family or friends. Presentations typically occur some hours after the exposure has occurred. In some cases the substance/s used is unknown at the time of emergency department presentation.

Adolescents tend to use substances that are cheap and readily accessible. The cheapest and most accessible substances are volatile substances (paint, glue). Alcohol is relatively cheap and is readily accessible in most homes (often provided by adults)[5]. Anecdotal evidence suggests that many children who misuse volatile substances stop the habit once they reach the legal age for drinking alcohol[3].

Only a small proportion of adolescents in the data series presented to an ED following poisoning with street drugs. Some of those presentations were due to exposure to dexamphetamine. Stimulant drugs (Dexamphetamine and Ritalin) used to treat attention deficit disorder are prescription drugs but are sometimes misused and deliberately ingested for their stimulant properties. Few children presented following intravenous injection of drugs (amphetamines (2)). No adolescents in this data series presented following exposure to narcotics.

High admission rates in drug, alcohol and plant poisoning are likely to be due to acute behavioural/mental health concerns rather than ongoing effects of poisoning. This is because the acute effects of many agents resolve within the first few hours after exposure. In the absence of ongoing symptoms or acute mental health issues the majority of children would have been discharged home.
In contrast, adolescents presenting following inhalation of volatile substances had a particularly low admission rate (16%). Many adolescents in this group present after hours, having

been brought in by police from a public area. Most leave the emergency department after the acute effects have worn off. In the absence of a parent or friend it can be difficult in these situations to adequately assess mental health status in these adolescents. Many adolescents are lost to follow up after discharge (or absconding) from the emergency department. Tracing them through family members is sometimes difficult due to social breakdown within the family.

Many children self-harm in an attempt to calm or centre themselves and this behaviour does not necessarily correlate with suicidal intent. Motivation to cause self-harm is complex and contributing factors may include a sense of hopelessness, lack of control, existing mental illness, impulsivity, conflict relating to schooling or home life and social problems[7]. A recent self-report school survey conducted in Queensland showed that deliberate self-harm (DSH) was prevalent in school aged children with 12.4% reporting an episode of DSH in their lifetime[4].
DSH was more common amongst girls, and often involved self-cutting or medication overdose. However, 4.7% reported using illicit drugs or inhalants as the agent of harm. Only 10% of episodes of DSH resulted in hospital attendance, with most children reporting that they turned to friends for assistance.

Prevention

Prevention of poisoning due to non-medicinal substances in adolescents has involved a range of strategies: primary prevention strategies (eg educational campaigns aimed at informing adolescents of the adverse health consequences and deterring initiation of substance use), harm minimisation strategies (eg safe places for substance use or strategies for safer use of substances) and intervention strategies (eg removing petrol sniffers from indigenous communities to outstations where they can "dry out"). Strategies specific to certain substances are described below.

Alcohol

Adolescents, particularly those under 16, are more vulnerable to the effects of alcohol and may become intoxicated on relatively small amounts of alcohol. Most prevention strategies focus on restriction of access for those under 18. A recent West Australian study showed that parents were the most common source of alcohol for adolescents (36%), followed by older friends (16%)[5]. Appropriate parental modelling on how, where, when and why to use alcohol will help adolescents learn responsible behaviours[8]. Programs which target changing parenting behaviours and parental education, have shown long term reductions in adolescent alcohol use. Several promising Australian interventions currently underway, include PACE, Teen Triple P, and ABCD Parenting Young Adolescents[9].

Volatile substances

These substances (petrol, solvents, glue, and paint) are often the drug of choice for adolescents because they are cheap and easy to access. They are found in most homes and so, if discovered by parents may be overlooked or explained away. Inhalation of these substances is not illegal in most Australian jurisdictions (although some South Australian bylaws exist against petrol sniffing).

Petrol

In Australia, petrol abuse or "sniffing" is a common problem in many remote indigenous communities, whereas abuse of other inhalants is more common in urban areas. Prevention strategies for petrol sniffing in remote indigenous communities have identified a need to engage children and give them a realistic alternative to sniffing. Interventional programs usually centre on recreational activities and should be "…exciting and provide opportunity for risk taking"[10]. Program reviewers have emphasised the need to tackle the problem before the number of "sniffers' in the community reaches a significant level. Locking up petrol sources (vehicles and petrol storage facilities) has had limited success as children prove adept at breaking in. Avgas has replaced petrol in some communities and together with community programs dramatically reduced the incidence of sniffing (avgas causes stomach pain and headaches when inhaled)[11]. More recently Opal fuel has been developed and advocated for use in NT communities where petrol sniffing is endemic. This fuel is low in aromatic compounds and does not produce the same "high" as standard petrol but currently costs approximately 25% more than standard petrol. The Queensland government has recently announced a trial of this fuel in remote areas for suppliers who have registered with the fuel subsidy scheme as part of a 15 month trial to reduce petrol sniffing[12]. Intervention strategies in some communities have involved removing adolescents from the sniffing environment of town or community to traditional lands or outstations where petrol and other volatile substances are not available. In addition to "drying out" the adolescents are taken back to "traditional learning, authority and discipline structures". However, many sniffers will resume the practice on returning to the community and researchers and community groups emphasise the need to tackle the underlying socio-economic

disadvantage that predisposes this group to substance misuse.

Street drugs

Research shows that with use of illicit drugs there can be a progression from oral or inhalational exposure to intravenous injection over time[6]. Harm minimisation strategies have included educational campaigns to deter the progression to intravenous use of drugs because of the additional health risk posed by needle sharing and acquired blood borne viruses. The National Drugs Campaign "Where's your head at?" is one example. The campaign has enlisted print and electronic media ads and the website offers a number of resources and role models for young people[13].

Hallucinogenic plants

Exposure to plant substances (other than marijuana) varies according to season and location and tends not to be an ongoing pursuit, therefore intervention strategies are not usually directed specifically at these substances. In our series, five children presented after ingesting candlenuts together, highlighting the cofactors of peer pressure and accessibility for choice of substance.

Self-Harm

There is some question as to whether or not self-harm is a precursor to suicide intent. Attending counselling to address issues of self-esteem and develop conflict resolution skills reduce the incidence of self-harm.

Summary

Exposure to alcohol, volatile substances, hallucinogenic plants and street drugs may result in serious consequences for adolescents who engage in this behaviour. Emergency department data provides new insights into substance abuse. A combined health and community approach is required to address this issue.

For further information refer to the following websites or the Queensland Safe Communities Support Centre website under programs. www.safecommunitiesqld.org

Links

ADAWS
www.kidsinmind.org.au/default2.asp?orgid=1&suborgid=20
ATODS
www.health.qld.gov.au/atods/
AIHW National Drug Campaign
www.drugs.health.gov.au/index.htm
Opal petrol
www.bp.com.au/products/fuels/opal/opal.asp
Triple P Parenting
www.triplep.net
ABCD Parenting Young Adolescents
www.abcdparenting.org

www.alcohol.gov.au

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