Medically serious self-harm in youth requiring ICU admission

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Background
Suicide is the second leading cause of death among Canadian adolescents, representing a quarter of all deaths among adolescents aged 15 to 19 years in 2011. 1 A past history of suicide attempts and self-harm are the best known predictors of future suicide attempts. 2 The incidence of suicide attempts peaks in adolescence. As such, while suicide attempts and self-harm behaviour are unfortunately common, death by suicide is comparatively rare. It is estimated that for every completed suicide there are as many as 20 suicide attempts. 3 Youth who make near fatal suicide attempts – such as those requiring intensive care unit (ICU) level care – may closely approximate those who die by suicide. Understanding the differences between youth who attempt suicide and those who die by suicide is important for suicide prevention interventions. Despite the unique and important knowledge that may be gained from understanding near-fatal suicide attempts, research in this area is absent.

Canadian statistics from 2011 reported 198 deaths by suicide among adolescents 15 to 19 years of age, representing a rate of 9 suicide-related deaths per 100,000 in this age group. 4 First Nations, Métis, and Inuit adolescents are at particular risk of suicide, with 5 to 11 times greater rates of suicide among these populations than Canadian youth in general. 3 Although suicide among pre-pubertal children is rare, suicidal thoughts and attempts do occur. 3 Recent data estimates that 29 children from 10 to 14 years of age
died by suicide in 2011 in Canada, representing a suicide rate of 1.5 per 100,000 in this population.

The primary methods of suicide for children and adolescents in Canada were hanging and suffocation. Studies examining trends among children and adolescents have reported increasing suicide rates among females between 1980 and 2008, and both boys and girls have experienced an increase in the medical severity of their emergency department (ED) presentations for suicide-related behaviours since 2004. A recent report from the Canadian Institute for Health Information (CIHI) indicates an increasing trend in hospitalizations for intentional self-harm among 10 to 17 year olds since 2009/10, particularly among females. Of hospitalizations for self-harm in 2013/14, poisoning was the primary method reported by 88% of females and 82% of males (N=2,140). Males are more likely to die from suicide, in part due to the differences in lethality of means. However, females are three to four times more likely to make a suicide attempt.

While there is literature on youth who die by suicide and literature on youth who self-harm without significant risk of death, data regarding the frequency and nature of near-fatal suicide attempts among children are absent. These data are important to: identify target groups at highest need for preventive intervention; and determine the health care costs and patient outcomes for affected children to inform resource allocation and service delivery decision making. By quantifying the impact and severity of self-harm behaviour requiring ICU level care, this study will provide data to support advocacy for children at high risk of death from self-harm and support the need for a national strategy for suicide prevention among youth.

Methods
Clinically active paediatricians, paediatric subspecialists (intensivists), and child psychiatrist members of the CPSP will be surveyed regarding self-harm necessitating ICU admission. Respondents that identify a case will be asked to complete a detailed questionnaire for each case.

Case definition
Report any new patient less than 18 years of age (up to the 18th birthday) meeting BOTH of the following criteria:

1. A confirmed or suspected self-harm or suicide attempt (any form of self-poisoning or self-injury regardless of the degree of intent to die)

   AND

2. Admitted to an intensive care unit at any time during a hospital admission (for any duration)

Exclusion criteria: Accidental poisoning (e.g., intoxication) or injury
Medically serious self-harm in youth requiring ICU admission (continued)

Objectives

Primary objective

To describe the patterns of presentation, clinical features, and associated medical needs of children presenting to hospital with self-harm requiring ICU care

Secondary objectives

1) To examine underlying mental health problems, duration of mental health symptoms, and health care utilization prior to ICU admission
2) To examine seasonal and geographical differences in presentation in Canada
3) To describe post-discharge treatment planned for these children, including regional differences in management
4) To determine a conservative prevalence rate of serious self-harm requiring ICU care, among Canadian children
5) To compare Canadian data with international epidemiological surveys

Duration

January 2017 to December 2018

Expected number of cases

There were approximately 2,700 hospitalizations for intentional self-harm among youth aged 10 to 19 years in Canada during 2010/11 (the most current data that are available for detailed analysis at the Public Health Agency of Canada). Further analysis of these cases is represented in Table 1.

Table 1. Hospitalizations associated with self-inflicted injury, 2010/11, males and females combined, by age group

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Total Admits</th>
<th>Discharge Home</th>
<th>OUTCOME Transferred</th>
<th>Died</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>10–14 years*</td>
<td>461</td>
<td>354 (76%)</td>
<td>88 (19%)</td>
<td>3 (1%)</td>
<td>16 (4%)</td>
</tr>
<tr>
<td>15–19 years†</td>
<td>2262</td>
<td>1689 (75%)</td>
<td>420 (18%)</td>
<td>14 (1%)</td>
<td>139 (6%)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>2723</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*59% were discharged within 48 hours
†56% were discharged within 48 hours

Based on numbers above (excluding all cases that were released within 48 hours, and counting patients who were either transferred or died as potentially being admitted to the ICU), it is estimated that the maximum number of cases may reach 500 per year; however, a more conservative estimate is 350 cases per year.

Ethical approval

Research Ethics Board, Hospital for Sick Children, Toronto, Ontario Health Canada and the Public Health Agency of Canada’s Research Board
Results will be reported using descriptive statistics in peer-reviewed journals (e.g., *Journal of the American Academy of Child and Adolescent Psychiatry, Paediatrics & Child Health*), presented to the Canadian Academy of Child and Adolescent Psychiatry and the Canadian Paediatric Society, and published in the annual *CPSP Results*.

**References**


2. Beautrais AL. Further Suicidal Behavior Among Medically Serious Suicide Attempters. Suicide Life Threat Behav 2004 Spring;34(1):1–11


