Deliberate Self-Poisoning In Adolescents

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Key words: adolescents, suicide attempts, poisoning, intoxication, risk factors

Abstract

Background: Adolescent suicide has become increasingly more prevalent in recent years, with self-poisoning being a frequent means of suicide attempt.

Objective: To investigate the factors associated with adolescent self-poisoning.

Methods: Data on adolescents referred for intentional self-poisoning to the Adolescent Medical Unit during the years 1990–1998 were evaluated retrospectively. Data were obtained from the hospital medical records and included the following factors: sociodemographic data, educational status, agent and route of intake, motivation for overdose, and the extent of serious suicidal intent.

Results: We evaluated 324 cases of adolescent self-poisoners aged 12–18 years (mean ± SD 14.8 ± 1.5 years). The female/male ratio was 8:1. Most of the patients were attending school and living in urban areas. Oral ingestion was the only route of intake; 84.5% of the patients ingested drugs and 10.5% non-medical compounds. The drug most commonly taken was acetylsalicylic acid. The non-medical compounds were mostly pesticides and household materials. The suicide attempts were most frequently associated with transient depression. Based on clinical psychiatric evaluation, patients who had ingested polydrugs and non-medical compounds evidenced a significantly greater suicidal intent ($\chi^2 = 11.9, P < 0.001$) compared to those who took only one or two kinds of drugs.

Conclusions: We found that self-poisoning attempts occur most frequently in depressed females at junior high and high school, usually in the context of family dysfunction. Non-medical drugs and polydrug ingestion are major risk factors for evaluating the seriousness of the suicidal intent.

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Suicide is a complex outcome of multiple inter-related factors [1]. Deliberate self-poisoning in adolescents is a common clinical problem for pediatricians and pediatric mental health professionals. The rate of recorded adolescent suicide attempts has steadily and markedly increased in recent decades [2], and it is one of the most common causes of death in adolescents [3]. It is therefore important to develop tools for assessing the circumstances of self-poisoning in adolescents, particularly the degree of suicidal intent, and the implications for treatment and prevention. This study investigated some of the circumstances and factors associated with adolescent self-poisoning.

Patients and Methods

We collected the hospital records of all patients who had been admitted for deliberate self-poisoning to the Adolescent Medical
evaluation. Eighty-five percent of the patients who swallowed non-medical compounds were aware of their potential toxicity as compared to only 7.9% of those who had self-administered a drug \( (\chi^2 = 127.5, P < 0.0001) \). Likewise, as shown in Table 3, patients who consumed three or more drugs also had a greater suicidal intent (based on psychiatric assessment) as compared to those who took only one or two kinds of drugs.

**Discussion**

Deliberate self-poisoning among adolescents is a major health problem. Most suicide attempts are a response to depression [2,4]. Figures for adolescent deaths due to intentional poisoning have been rising among British and American teenagers [2,5]. In fact, statistics for the USA indicate a threefold increase in the rate of adolescent suicide attempts in recent years [3].

Our findings revealed that self-poisoning suicide attempts were most common in female adolescents who were attending school and living in urban areas. A higher proportion of female to male adolescent self-poisoning attempts has also been reported in other studies [6,7]. On the other hand, it seems that male adolescents often resort to different suicidal means and some authors claim a higher suicide rate for males [8,9].

In accordance with other studies, our research confirms that drugs are the most frequent agent of self-poisoning [10], and that acetaminophen is the drug most frequently consumed [3,6,10–12]. Self-poisoners tend to use those agents that are easily accessible, and acetaminophen is an over-the-counter medication.

Some authors [13–15] have observed that self-poisoners often lack awareness of the toxic and lethal potential of the drugs they have ingested. Our study showed that patients who had taken non-medical agents or multiple drugs seemed to be more aware of the potential toxicity of the agents and had a more serious suicidal intent than those who had taken only one or two kinds of medication. This finding has not been previously reported and is of particular interest since it identifies high risk suicide attempts, indicating that particularly these adolescents need intensive therapy and close follow-up.

In conclusion, self-poisoning is frequent in depressed junior high and high school female adolescents and is generally associated with family disorders. The main finding of this study

**Table 1. Patients' feelings preceding the overdose**

<table>
<thead>
<tr>
<th>Feeling*</th>
<th>Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. (%)</td>
</tr>
<tr>
<td>Transient depression</td>
<td>286 (88.2%)</td>
</tr>
<tr>
<td>Loneliness</td>
<td>271 (83.6%)</td>
</tr>
<tr>
<td>Stress</td>
<td>211 (65%)</td>
</tr>
<tr>
<td>Not being wanted</td>
<td>174 (53.7%)</td>
</tr>
<tr>
<td>Unknown</td>
<td>28 (8.6%)</td>
</tr>
</tbody>
</table>

* Some patients mentioned a combination of these feelings

**Table 2. Background problems associated with the overdose**

<table>
<thead>
<tr>
<th>Background problems*</th>
<th>Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. (%)</td>
</tr>
<tr>
<td>Child-family disorder</td>
<td>210 (65%)</td>
</tr>
<tr>
<td>Disappointment in love</td>
<td>81 (25%)</td>
</tr>
<tr>
<td>Difficulties in school</td>
<td>16 (5%)</td>
</tr>
<tr>
<td>Undiagnosable</td>
<td>17 (5%)</td>
</tr>
</tbody>
</table>

* Some patients mentioned more than one problem

**Table 3. Relationship between the number of drugs and serious suicidal intent**

<table>
<thead>
<tr>
<th>No. of agents</th>
<th>Patients</th>
<th>Patients with serious suicidal intent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. (%)</td>
<td>No. (%)</td>
</tr>
<tr>
<td>1</td>
<td>181 (62.4%)</td>
<td>0/181 (0%)</td>
</tr>
<tr>
<td>2</td>
<td>54 (16.6%)</td>
<td>1/54 (1.8%)*</td>
</tr>
<tr>
<td>3</td>
<td>27 (9.3%)</td>
<td>11/27 (40.7%)*</td>
</tr>
<tr>
<td>4</td>
<td>18 (6.2%)</td>
<td>7/18 (38.9%)*</td>
</tr>
<tr>
<td>5</td>
<td>10 (3.4%)</td>
<td>4/10 (40%)*</td>
</tr>
</tbody>
</table>

* Compared to one agent, \( \chi^2 = 3.30, P = 0.07 \)
** Significant difference compared to one and two agents, \( \chi^2 = 11.9, P < 0.001 \)
shows that the use of non-medicinal agents and the ingestion of several types of drugs are major risk factors for evaluating the extent of serious suicidal intent in adolescents.

References

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A man cannot be too careful in his choice of enemies

Oscar Wilde, 19th century Irish writer and witlock

**Capsule**

**Chaperoning neuronal degeneration**

In a fly model of Parkinson’s disease, Auluck et al. have demonstrated a role for the molecular chaperone Hsp70 in protecting dopaminergic neurons in the presence of pathological levels of synuclein. When the authors went on to examine Lewy bodies in postmortem samples from human patients, these characteristic pathologic lesions also contained high concentrations of molecular chaperones. These results suggest that modulating the activity of chaperone proteins may help in treating this debilitating disease. *Science* 2002;295:865

**Capsule**

**Coordinating synaptic development**

Two different mechanisms guide the development of the central nervous system. Molecular signals initially guide developing neurons to the correct position and, once neuronal activity begins, repeated stimulation helps synapses form and mature. Takasu et al. describe a signaling mechanism that may integrate these two processes. Ephrins and their receptors are cell-surface proteins that participate in interactions of developing axons and dendrites that are largely independent of neuronal activity. However, the activation of the EphB subtype of ephrin receptors in rat neurons potentiated signaling by N-methyl-d-aspartate (NMDA)-type glutamate receptors, which mediate activity-dependent effects on developing neurons. Activated EphB proteins associated physically with NMDA receptors and caused the activation of the Src tyrosine kinase, which apparently phosphorylates the NMDA receptor and thus modulates activity-dependent control of neuronal gene expression. *Science* 2002;295:491