

Brief Report

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Characteristics of Adolescent Patients Admitted to the Emergency Department due to Attempted Suicide by Poisoning; a Brief Report

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Abstract

Introduction: In the background of the increased suicide rate in the second decade of life, analysis of the characteristics of poisoning-related attempted suicide in adolescents and evaluation of the differences from adults may form an important basis for establishing measures to prevent deaths from poisoning.

Objective: We aimed to investigate the types of toxic substances ingested for attempted suicide by poisoning in adolescents admitted to the emergency department (ED).

Method: This cross-sectional study retrospectively analyzed and investigated the medical records of patients aged 13 or older, admitted to the ED of a tertiary medical institute over a period of 3 years, for attempted suicide by poisoning.

Results: The psychiatric diagnoses among patients in the adolescent group included depression (75.8%), bipolar disorder (12.5%), and panic disorder (12.5%). In terms of the type of drug used for poisoning, antidepressants or anti-psychotics and sleeping pills were the most commonly used in the adolescent (43 subjects, 45.2%) and adult (286 subjects, 37.6%) groups, respectively.

Conclusion: As there is a higher chance of poisoning by easily accessible drugs, the emergency physician needs to investigate any preceding diagnoses of psychiatric or medical illnesses in the adolescent patients attempting suicide with unknown drugs.

Key words: Adolescent; Poisoning; Suicide

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INTRODUCTION

Adolescents are more likely to attempt suicide by ingesting medications for poisoning. In the background of the increased suicide rate in the second decade of life (1), we speculate that an analysis of the characteristics of poisoning-related attempted suicide in adolescents and evaluation of the differences from adults may form an important basis for establishing measures to prevent deaths from poisoning in adolescents. Previous studies on substances chosen for self-harm in adolescents have shown variable results. The findings have variably indicated an increase in acetaminophen-related hospitalizations, a decrease in salicylate ingestions, and an increase in the ingestion of over-the-counter medicines, prescription sedatives, and antidepressants (2). However, till date, compared to studies on poisoning-related suicide in adult and elderly patients, there have not been a sufficient number of studies on the intentional poisoning among adolescents in Korea. Also, the characteristics of the adolescents attempting

suicide by poisoning in recent years has not been well investigated. This study aimed to investigate the types of toxic substances ingested for attempted suicide by poisoning in a cohort of adolescents admitted to the emergency medical center of a tertiary medical institute over a period of 3 years. The differences in characteristics from the adult population were also investigated to facilitate the institution of preventive measures against future poisoning-related suicides in the adolescent population.

METHODS

Study design

This cross-sectional study retrospectively analyzed and investigated the medical records of patients admitted to the emergency medical center of a tertiary medical institute over a period of 3 years, between 1 May 2015 and 30 Apr 2018 for attempted suicide by poisoning in Seoul, Korea. This study was approved by the Institutional Review

Board of Ewha Womans University Mokdong Hospital (No. EUMC 2019-05-028).

Study population

In this study, all patients between the ages of 13 and 18 years were classified as adolescents, and those aged 19 years or older were classified as adults. The poisons included both, overdoses of therapeutic drugs, even if taken for therapeutic purposes, and non-therapeutic drugs.

Data gathering

In accordance with the approved classification of the Ministry of Food and Drug Safety, the types of drugs used for poisoning were classified into the following five categories: 1) Antidepressants and anti-psychotics (tricyclic antidepressants, selective serotonin reuptake inhibitors, serotonin norepinephrine reuptake inhibitors, new antidepressants, and anti-psychotics, among others), 2) Sleeping pills (benzodiazepines, and non-benzodiazepines), 3) Analgesics (narcotic, non-narcotic, aspirin, acetaminophen, and non-steroidal anti-inflammatory drugs), 4) Over-the-counter (OTC) medications (sleep-inducing-drugs, and doxylamine), and 5) Other drugs (herbal medicines, anti-hypertensives, diabetic medications, and other self-administered drugs). Sex, age, presence of underlying disease, presence of mental illness, composition of medications taken for poisoning, and dosage were investigated in all subjects.

Statistical Analysis

The SPSS version 25.0 (SPSS Inc., Chicago, IL, USA) software package was used for statistical analyses in this study. The frequency of each item was listed

with the percentage. The Pearson's chi-squared and Fisher's exact- tests were used to evaluate differences between the groups. P-value <0.05 was considered statistically significant.

RESULTS

During the study period, 1777 patients were brought to the emergency medical center for attempted suicide. Among them, 855 patients (48.1%) were admitted to the hospital for the management of poisoning. Among them, 95 (11.1%) and 760 (88.9%) patients were in the adolescent and adult groups, respectively. In the adolescent group, the number of patients attempting suicide in the second decade of life were found to have increased, particularly in the later years. In terms of sex, the adolescent and adults groups comprised 19 males (20.0%) and 76 females (80.0%), and 221 males (29.0%) and 539 females (71.0%), respectively. No statistically significant difference was noted between the two groups with respect to sex. The psychiatric diagnoses among patients in the adolescent group included depression (75.8%), bipolar disorder (12.5%), and panic disorder (12.5%) (Table 1).

In terms of the type of drug used for poisoning, antidepressants or anti-psychotics and sleeping pills were the most commonly used in the adolescent (43 subjects, 45.2%) and adult (286 subjects, 37.6%) groups, respectively. Compared to the adult group, antidepressants and anti-psychotics ($p=0.029$) and analgesics ($p=0.045$) accounted for the highest proportion of drugs in the adolescent group. Sleeping pills ($p=0.003$)

Table 1: Baseline demographic and clinical characteristics of suicide victims

Variable	Adolescent (13~18 years)	Adult (≥19 years)	Total	P-value
	Number (%)			
Sex				
Male	19 (20.0)	221 (29.0)	240 (28.0)	0.261
Female	76 (80.0)	539 (71.0)	615 (72.0)	
History of psychiatric disorder				
Present	52 (54.7)	359 (47.2)	411 (48.1)	0.448
Absent	43 (45.3)	401 (52.8)	444 (51.9)	
Total	29 (6.0)	451 (94.0)	855 (100)	

Table 2: Relationship between poisoning drug classification and age group

Poisoning drug	Adolescent (13~18 years)	Adults (≥19 years)	P-value
	Number (%)		
Antidepressants and antipsychotics	43 (45.4)	198 (26.1)	0.029
Hypnotics	10 (10.5)	286 (37.6)	0.003
Analgesics	23 (24.2)	84 (11.1)	0.045
Over the counter drugs	3 (3.1)	55 (7.2)	0.431
Etc.†	16 (16.8)	137 (18.0)	0.946

†; Herb, hypertensive medication, diabetes medication, other drugs for own disease

accounted for the highest proportion in the adult group (Table 2). However, no significant differences were found between the two groups with respect to OTC medications and other drugs, including herbal medicines.

DISCUSSION

In order to prevent suicide, it is necessary to analyze the responsible factors from various angles. One of these is to understand how it is attempted. Reports suggest that suicide attempts in adolescents are particularly associated with the self-administration of drugs. It is known that poisoning accounts for approximately 70% to 96.5% of suicide attempts (3-5); the type of intentionally ingested drug varies by age (6). Previous studies have shown that adults were most likely to choose sedatives or sleeping pills for an intentional overdose. In contrast, adolescents tend to select analgesics including acetaminophen as the drug of choice for suicide (6-9).

In this study, adolescents had a higher risk of poisoning with antidepressants, anti-psychotics, and analgesics compared to adults; adults had a higher risk of poisoning with sleeping pills. Previous studies on poisoning among adolescents have shown that they most commonly used antipyretic analgesics for suicidal purposes. The authors speculated that the reason for the high rates of use of antipyretic analgesics among adolescents was that they are cheap and easily available in the pharmacy without a prescription (8). Another study reported that the most commonly used drug for suicidal purposes in adolescents was acetaminophen, followed by ibuprofen, selective serotonin reuptake inhibitors (SSRI), and atypical antipsychotics (2). However, in this study, adolescents used a higher proportion of antidepressants and anti-psychotics than antipyretic analgesics.

This difference could be explained by the fact that in this study, the number of adolescents with a psychiatric or medical history was higher than that of other studies. In the studies published by Kim et al. and Kwon et al., the rates of diagnosis of psychiatric illnesses were 13.9% and 21.4% (6). At 55.2%, the diagnosis rate in this study was high. Since adolescents diagnosed with psychiatric illnesses are presumed to have easy access to prescription drugs of their own, more patients in this study may have taken antidepressant and antipsychotic agents compared to that of other studies. The findings of this study were consistent with the findings of the previous studies, which suggested that adolescents use drugs that are

easily accessible. According to the current data from the National Health Insurance Service on the medical care of adolescents in their second decade, the number of adolescents treated for depression had progressively increased to 22,541 in 2016 and 25,548 in 2017. In Korea, the rate of increase in depression among the youth is the second highest in all age groups. As the rates of psychiatric treatment among adolescents are increasing, accessibility to psychiatric drugs are expected to be easier than before.

The findings of this study showed that antidepressants and anti-psychotics accounted for the largest percentage of poisoning cases in adolescent patients who attempted suicide; this contradicts the findings of previous studies. We speculate that this finding may be related to the increased rates of diagnosis with psychiatric illnesses among adolescent patients. Since emergency physicians manage cases of poisoning with antidepressants, SSRIs, and antipsychotics, it is important for them to understand the potential risks they pose and to counsel parents on limiting access to harmful doses. It may be presumed that adolescents ingest their own medications. However, to attempt suicide, adolescents take several psychotropic medications available in the home that are not always prescribed for them. These drugs may be used irrespective of whether they were prescribed for themselves or for adults residing with them.

Limitations

One limitation of this paper is that it may not reflect the characteristics of all of the self-poisoned patients in Korea, since the characteristics of the self-poisoned patients by age were analyzed based on the data of one tertiary medical emergency center. Also, the number of adolescent patients enrolled were not sufficient to allow generalization of these characteristics among all patients between 13 and 18 years of age. To address these issues, future prospective studies will be necessary over sufficient periods of time, including hospitals with different regional characteristics for the same subjects.

CONCLUSIONS

As the number of suicide attempts increase every year in the adolescent age group, the prevention of suicides in survivors is of utmost importance. As there is a higher chance of poisoning by easily accessible drugs, the emergency physician needs to investigate any preceding diagnoses of psychiatric or medical illnesses in the adolescent patients attempting suicide with unknown drugs. This will

aid in the prompt identification of the drug used for the overdose, and facilitate management.

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AUTHORS' CONTRIBUTION

Conception and design: YH Choi (Yoon Hee Choi), JH Lee. Acquisition, analysis, and interpretation of data: DH Lee, JY Lim, Keon Kim, YH Choi (Yoon Hee Choi), YH Choi (Yun Hyung Choi), JH Lee. Drafting the manuscript for intellectual content: JY Lim, YH Choi (Yun Hyung Choi). All authors reviewed,

revised, and approved the manuscript for submissions.

CONFLICT OF INTEREST

The authors declare that they have no competing interests.

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