REFACS

Original Article
Rev. Fam., Ciclos Vida Saúde Contexto Soc.
http://seer.uftm.edu.br/revistaeletronica/index.php/refacs/index
ISSN: 2318-8413 DOI: 10.18554/refacs.v11i1.6546

Analysis of suicide attempts in male adolescents assisted by a Detox Center

Análise das tentativas de suicídio em adolescentes masculinos atendidos por um Centro de Intoxicação

Análisis de los intentos de suicidio en adolescentes de sexo masculino asistidos por un Centro de Toxicología

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Received: 21/11/2022 **Accepted**: 10/02/2023 **Published**: 19/03/2023

Objective: to analyze the clinical and epidemiological profile of suicide attempts in male adolescents. **Methods:** cross-sectional study with secondary data from male adolescents treated for suicide attempts between 2017 and 2020 at a Center for Information and Toxicological Assistance. Descriptive analysis was performed. **Results:** 297 adolescents aged between 12 and 18 years were considered, with a mean age of 16.1 ± 1.6 years, white (70.7%) and students (88.5%), 66.6% had incomplete High School education, lived in the urban area (99%) and were exposed at home (95.9%). Hospitalization occurred in one fifth of the cases. Mild symptomatic cases predominated, with drowsiness in 16.2%. The number of agents used ranged from 1 to 5, with a predominance of oral route. Medications were the most used (80.5%) and evolution to cure occurred in 80.5% of cases. **Conclusion:** to consider the possible underreporting of intoxication due to suicide attempt, better understand this phenomenon and understand how the findings of this study can reaffirm the need the promotion of preventive strategies.
Descriptors: Suicide, Attempted; Poisoning; Adolescent; Men.

Objetivo: analisar o perfil clínico e epidemiológico das tentativas de suicídio em adolescentes do sexo masculino. **Método:** estudo transversal com dados secundários de adolescentes masculinos atendidos por tentativas de suicídio entre 2017 e 2020 em um Centro de Informação e Assistência Toxicológica. Foi realizada análise descritiva. **Resultados:** considerou-se 297 adolescentes, com idade variando entre 12 e 18 anos, com média de 16,1±1,6 anos, brancos (70,7%) e estudantes (88,5%), com 66,6% apresentando ensino médio incompleto, residindo na zona urbana (99%) e local de exposição na residência (95,9%). A internação ocorreu em um quinto dos casos. Predominaram casos leves sintomáticos, com sonolência em 16,2%. O número de agentes utilizados variou de 1 a 5, predominando a via oral. Os medicamentos foram os mais utilizados (80,5%) e a evolução para cura ocorreu em 80,5% dos casos. **Conclusão:** a considerar a possível subnotificação de intoxicação por tentativa de suicídio, compreender melhor tal fenômeno e entender como os achados deste estudo podem reiterar a necessidade de fomento de estratégias preventivas.
Descritores: Tentativa de suicídio; Intoxicação; Adolescente; Homens.

Objetivo: analizar el perfil clínico y epidemiológico de los intentos de suicidio en adolescentes de sexo masculino. **Método:** estudio transversal con datos secundarios de adolescentes de sexo masculino atendidos por intentos de suicidio entre 2017 y 2020 en un Centro de Información y Asistencia Toxicológica. Se realizó un análisis descriptivo. **Resultados:** se consideraron 297 adolescentes, con edad que varió de 12 a 18 años, con media de 16,1±1,6 años, de color blanco (70,7%) y estudiantes (88,5%), con 66,6% con escuela secundaria incompleta, residiendo en el área urbana (99%) y lugar de exposición en la residencia (95,9%). La hospitalización se produjo en una quinta parte de los casos. Predominaron los casos sintomáticos leves, con somnolencia en el 16,2%. El número de agentes utilizados osciló entre 1 y 5, predominando la vía oral. Los fármacos fueron los más utilizados (80,5%) y la evolución hasta la cura ocurrió en 80,5% de los casos. **Conclusión:** teniendo en cuenta la posible infranotificación de la intoxicación por intento de suicidio, una mejor comprensión de dicho fenómeno y como los hallazgos de este estudio pueden reiterar la necesidad de promover estrategias preventivas.
Descriptores: Intento de suicidio; Intoxicación; Adolescente; Hombres.

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INTRODUCTION

Suicide is defined as an individual's intentional act of ending their own life and, for each consummated act, there are an estimate of another 20 attempts, qualified as the main risk factor for suicide itself[1-2]. The beginning of the process encompasses suicidal ideation, that is, the desire to die and the thought of taking one's own life[3]. It becomes a growing public health problem by generating impacts that go beyond the victim, with the potential to affect, for long periods, family, friends and communities inserted in its context. Annually, about 800,000 people die from suicide, and every 40 seconds there is a new victim[4-5].

Young people are the most vulnerable group to suicide, as it is the second leading cause of death in 15 to 29-year-olds[5]. According to the Brazilian Child and Adolescent Statute (*Estatuto da Criança e do Adolescente* - ECA), adolescence comprises individuals aged between 12 and 18 years[6]. In this phase of development, the biopsychosocial changes are intense, which include the search for identity, physical transformations and a variety of experiences, conflicts, emotions and disappointments[2]. This transition, along with financial issues, family breakdown, psychiatric comorbidities, alcohol and other drug abuse, social isolation and childhood trauma, determine a set of factors that, when associated, can induce suicidal ideation in young people and, in some cases, have a fatal outcome[2,7].

Suicide attempts with medication are generally less lethal compared to more violent methods, such as hanging and firearms, as their victims are more likely to be cared for alive in a hospital environment[7]. Among the toxic agents most used by young people, analgesics, antiallergics, antibiotics, anticonvulsants and other psychotropic drugs stand out[8]. Many of these drugs do not need a medical prescription and are easily available at home, which favors access to these substances and enables their misuse in intentional ingestions[7]. In addition, the adolescent patient's home is considered the main place of suicide attempts[9].

The ingestion of highly toxic agents, such as rodenticides, pesticides, drugs of abuse or the association of multiple agents, may lead to more severe clinical conditions. Thus, the toxicity of the agents used and the amount ingested are determining factors for establishing the hospital care that should be provided to the patient. Appropriate and early management in cases of intoxication increases the chances of full recovery, but, depending on the toxic effect of the agent, sequelae or death may occur[7,10]. In the context of poisoning, suicide due to the use of pesticides stands out as the main cause of death, followed by the use of medication[1].

Men more frequently opt for more lethal methods for suicide attempts, such as sharp objects, while women make greater use of poisoning[11]. Although the number of suicide attempts due to medication use is lower in men, it is known that, when they occur, they are

more serious and with a higher chance of death. The use of highly toxic agents in males, such as pesticides, reflects this finding[12].

Despite the relevance of the subject, the scientific production on suicide in adolescence in Brazil remains incipient, especially among males[2]. In addition, only 25% of patients who attempt suicide seek health services, which, associated with the significant underreporting of these cases, makes it difficult to obtain data closer to reality about these events[9,11].

With suicide attempts being the second cause of death among young people, a premature and potentially preventable form of death and a relevant public health problem, its characterization may contribute to a better understanding of the magnitude of the issue and may reiterate the need to be preventive and care strategies aimed at this age group have been developed[1,8]. Thus, this study aimed to analyze the clinical and epidemiological profile of suicide attempts in male adolescents.

METHODS

This is a cross-sectional study, based on consultations carried out by the Center for Information and Toxicological Assistance of the city Londrina (CIATox-Londrina), which is located at the University Hospital of Londrina. CIATox-Londrina works in the frontlines of urgencies and emergencies of the Unified Health System (SUS) through face-to-face and remote assistance in cases of toxicological events. The service operates 24 hours a day, every day of the week, and is part of the 17th Health Region of the state of Paraná. Its coverage area includes the municipalities of this region and other locations in Paraná and Brazil. It is a reference center for treatment of poisoning by drugs, venomous animals, pesticides, rodenticides, domestic and industrial products and toxic plants.

The study population consisted of male adolescents, between 12 and 18 years old, who were treated for suicide attempts by CIATox-Londrina from 2017 to 2020.

The variables analyzed were related to: the patient (age, area of residence, education, profession and race), the toxicological event (toxic agents, number of toxic agents, exposure site, route of exposure and clinical manifestations), and the clinical care (place of care, hospitalization, length of stay, final severity and outcome).

The study data were collected from the CIATox-Londrina attendance records. The information was recorded in the Brazilian Intoxication Data System (*Sistema Brasileiro de Dados de Intoxicação* - DATATOX), an online platform maintained by the Brazilian Association of Toxicological Information and Assistance Centers (*Associação Brasileira de Centros de Informação e Assistência Toxicológica* - ABRACIT). This virtual tool stores information on cases

attended by the center, such as data on the patient, the toxic agent, the circumstances of exposure, manifestations and clinical evolution, as well as therapeutic guidelines and the outcome of the case. Furthermore, it allows for the insertion of additional data such as images, laboratory results and attachments.

Data obtained from DATATOX were exported to a Microsoft Excel™ spreadsheet, which was used for data analysis.

The Project was approved by the Research Ethics Committee of the Universidade Estadual de Londrina (UEL), under Approval No. 1,138,541.

RESULTS

Information from 297 patients was considered, which corresponded to the number of cases of suicide attempts among male adolescents assisted by CIATox-Londrina in the period from 2017 to 2020. Ages ranged from 12 to 18 years and their average was 16, 1 (±1.6) years.

Most were white (70.7%) and students (88.5%), of which 66.6% had not yet finished high school. Almost all adolescents (99.9%) lived in urban areas. Table 1 indicates the sociodemographic profile of the cases assisted by CIATox-Lodrina.

Table 1. Sociodemographic characterization of male adolescents attended for suicide attempts by CIATox-Londrina, 2017 to 2020. (No=297)

Sociodemographic variables		No	%
Age (in years)	12	9	3.0
	13	12	4.0
	14	26	8.7
	15	47	15.8
	16	69	23.2
	17	73	24.6
	18	61	20.5
Area of residence	Rural	13	4.4
	Urban	282	94.9
	Unknown	2	0.7
Occupation	Student	263	88.5
	Other	34	11.4
Race	Asian	2	0.7
	White	210	70.7
	Mixed (*pardo*)	3	1.0
	Black	63	21.2
	Unknown	19	6.4
Educational level	Complete primary school	14	4.7
	Incomplete primary school	54	18.2
	Complete high school	22	7.4
	Incomplete high school	198	66.7
	Incomplete higher education	7	2.3
	Unknown	2	0.7

As for care, most patients were located in general hospitals (47.1%) and emergency care units, corresponding to 34% of cases. About one fifth (20.5%) of the adolescents required hospitalization, with length of stay ranging from 1 to 10 days. The evolution to cure was present in 80.5% of the cases (Table 2).

Table 2. Characterization of the place of care, hospitalization and outcome of suicide attempts among male adolescents attended by CIATox-Londrina, 2017 to 2020. (No=297)

Variables		No	%
Location of service	Emergency service	101	34.0
	General hospital	140	47.1
	Health post	3	1.0
	Health center/Basic Health Unit	6	2.0
	Polyclinic	10	3.4
	Others	7	2.3
	Unknown	30	10.1
Hospitalization	Yes	61	20.5
	No	236	79.5
Clinical outcome	Asymptomatic	40	13.5
	Cure	239	80.5
	Unknown	18	6.0

The main place of exposure to toxic agents was the adolescents' homes (95.9%) and the oral route was present in 296 of the 297 cases treated. In 97.3% of the cases, that was the only route taken, but in the rest, it was associated with other routes, such as intravenous,

subcutaneous, nasal and respiratory/inhalation. About 60% of cases were classified as mild and 85.5% as symptomatic. The number of agents used ranged from 1 to 5, with a single agent being used in 78.4% (Table 3).

Regarding toxic agents, the use of medication was present in 80.5% of cases, followed by drugs of abuse (8.7%), pesticides (6.1%), rodenticides (5.7%) and household cleaning products (4%). Among the main symptoms presented, drowsiness was the most predominant, present in 16.2%. Other symptoms present were: tachycardia (13.1%), vomiting (11.4%), hypotension (8.7%), agitation (6.7%), nausea (5.7%), lethargy (5%), hypertension (5%), altered consciousness (4.4%) and headache (3.4%) (Table 3).

Table 3. Characterization of the exposure site and clinical variables of toxicological events due to suicide attempts among male adolescents assisted by CIATox-Londrina, from 2017 to 2020. (No=297)

Variables		No	%
Place of exposure	External/public environment	3	1.0
	School/daycare	4	1.3
	Workplace	1	0.3
	Habitual residence	285	95.9
	Residence (other)	4	1.3
Final severity	Severe	12	4.0
	Unknown	6	2.0
	Mild	179	60.3
	Moderate	60	20.2
	Null	40	13.5
Route of exposure	Exclusively oral	289	97.3
	Others	8	2.7
Signs and symptoms	Absent	42	14.1
	Present	255	85.8
Number of agents	1	233	78.4
	2	55	18.5
	3	7	2.3
	4	1	0.3
	5	1	0.3

DISCUSSION

The mean age among male adolescents who attempted suicide was 16.08 years. In this group, the home was the main place of exposure, the oral route and the use of medication were predominant, with mild cases of intoxication standing out.

The focus on male adolescents was due to their singularities. Adolescents represent a group whose suicide rates have been on the rise in recent decades, so that some of the reasons for this are the growing prevalence of depressive disorders, as well as the increasingly early abusive use of psychoactive substances[8]. A research that sought to identify risk and protective factors for suicide attempts in emerging adulthood pointed to anxiety disorders and episodes

of violence in the family and community as triggers for suicide attempts in a group already vulnerable due to the inconstancies of a physiological and social period of transitions[2-3]. These facts corroborate the results of a study on male hospitalizations recorded by a toxicology assistance center in Paraná, in which 25% of hospitalizations for suicide attempts occurred among adolescents[7].

Bullying stands out as a risk factor for suicide attempts in adolescence. It is characterized as a set of physical or social actions committed against an individual unable to defend themself. It presents significant rates in adolescence and is capable of exerting long-term deleterious effects on its victims. Of the repercussions, a greater predisposition to: depressive disorders, anxiety, stress and suicidal ideation[13] stands out.

With regard to males, the permanence of the social stigma of invulnerability is noted[12]. Thus, men, compared to women, tend to seek less help for their problems, which can lead to suicide attempts. Compared to the female public, the methods used in the act of trying to take one's own life are generally more lethal, such as the use of firearms and hanging[9].

The mean age in the survey was 16.08 years, similar to the value of 16.1 ± 2.3 years in a study of suicide attempts due to drug intoxication among adolescents registered by a Toxicological Assistance Center in the city of Fortaleza, in the state of Ceará, from 2010 to 2014, and most men had the occupation of student (88.5%)[1] as in the present study.

In the same study, the home was the main place where suicide attempts were made among adolescents (No=230, p=0.689)[1], also in line with the current study, in which 95.9% of the cases also had the home as place of exposure. In another study that sought to analyze the epidemiological profile of adolescents who attempted suicide in 2014, 81.9% of cases occurred in the homes of these young people[9]. This fact can be explained by the Brazilian culture of home medication stock, which facilitates access to various substances, contributes to self-medication and its accidental use or misuse, as in suicide attempts[1].

Regarding toxic agents, the use of medication was present in 80.5% of cases. In an investigation carried out among adolescents attended for suicide attempts or substance use/abuse in the psychiatric emergency department of a university hospital from 1988 to 2004, the choice of medication as an agent was present in 73.8% of the cases[8]. Although the present study does not discuss drug classes, data indicate that the drugs used by young people are diverse, such as psychopharmaceuticals, drugs that do not require medical prescription, such as analgesics (aspirin, paracetamol), and others, such as antibiotics, anticonvulsants and antiallergics[8]. Among the drugs that require prescription, their availability at home can be justified by poor adherence to proposed treatments and prescription in quantities greater than

necessary, which allows the creation of a surplus of these substances, often available in the adolescent's own home[1].

Pesticides were used in 6.1% of the cases and, although none of the patients in the study died, it is known that these agents have a significant lethal potential, especially among men, who have easier access to these agents in their occupational activities[12]. In a survey that analyzed hospital admissions due to intoxication registered at a toxicological assistance center, these agents were responsible for a greater number of patients admitted to Intensive Care Units (4.3%) and for the greater number of deaths (6%)[12].

The oral route was used in 296 of the 297 cases treated. A study that characterized the epidemiological profile of exogenous intoxications that occurred among children and adolescents in a municipality in the state of Mato Grosso indicated this route as the most prevalent. This can be justified by the ease of administration and because it is one of the main routes of drug introduction[10].

The predominance of mild cases, with 60.2% of attempts within this classification, can be supported by the study by Lôbo *et al*, who found mild poisoning in 43% of their cases and progression to hospital discharge in 72.6% of them[1]. It is noted that suicide attempts sometimes occur as impulsive acts with low intentionality and, thus, directly use easily accessible agents, such as those present at home, for example[7].

Suicide attempts are underreported in Brazil and, therefore, make it difficult to access a broader number of cases, which could contribute to the analysis performed[4]. This underreporting also has an impact on the direction of public policies, as it restricts knowledge about the real dimensions of the problem of suicide attempts among adolescents and limits efforts to resolve this issue[4].

CONCLUSION

The adolescents participating in the study were mostly students, white and residing in urban areas. The home was the main exposure site and the oral route was preferred. There was a predominance of mild and symptomatic cases and drugs were the most used agents, with evolution to cure in most cases treated.

The limitations of the present study are found in data identified as unknown or ignored, which limit the knowledge about the totality of the evaluated parameters.

Additional studies that can expand knowledge on the subject could favor the development of care strategies for the prevention and better care of cases of suicide attempts in adolescence, a potentially preventable cause of death.

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Associated Publisher: Rafael Gomes Ditterich

Conflict of Interests: the authors declared there is no conflict of interests.

CONTRIBUTIONS
Camilo Molino Guidoni and **Edmarlon Girotto** contributed to the study conception and project, data collection and analysis, writing and revision. **Valdir Bento da Costa Junior** and **Yasmin Bernardes Barboza** collaborated in the study conception and project, data collection and analysis, and writing.

How to cite this article (Vancouver)
Barboza YB, Costa Júnior VB, Girotto E, Guidoni CM. Analysis of suicide attempts in male adolescents assisted by a Detox Center. Rev Fam, Ciclos Vida Saúde Contexto Soc. [Internet]. 2023 [cited in *insert day, month and year of access*]; 11(1):e6546. Available from: *insert access link*. DOI: *insert DOI link*.

How to cite this article (ABNT)
BARBOZA, Y. B.; COSTA JÚNIOR, V. B.; GIROTTO, E.; GUIDONI, C. M. Analysis of suicide attempts in male adolescents assisted by a Detox Center. **Rev. Fam., Ciclos Vida Saúde Contexto Soc.**, Uberaba, MG, v. 11, n. 1, p. e6546, 2023. DOI: *insert DOI link*. Available from: *insert access link*. Access in: *insert day, month and year of access*.

How to cite this article (APA)
Barboza, Y.B., Costa júnior, V.B., Girotto, E., & Guidoni, C.M. (2023). Analysis of suicide attempts in male adolescents assisted by a Detox Center. *Rev. Fam., Ciclos Vida Saúde Contexto Soc.*, 11(1). Retrieved in *insert day, month and year of access* from *insert access link.* DOI: *insert DOI link.*