

# Epidemiology of suicide attempts in a public health care area: the perspective of an emergency medical service

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None

**Objectives:** To determine the rate of attempted suicide in the health care area of Salnés, Spain, attended by the assigned emergency medical service (EMS) provider and to analyze epidemiologic variables.

**Methods:** Retrospective study of all suicide attempts attended by the EMS over a 5-year period. Data analyzed were day and time emergency care was given, age of the patient, sex, history of psychiatric disease, alcoholism, drug abuse, and history of attempted suicide.

**Results:** A total of 285 attempts were on record (annual incidence, 76.1/100 000 population). The mean (SD) age was 35 (15) years and 58.9% were women. A history of psychiatric disease was present in 74.4% of the patients, and 46.7% had attempted suicide before. This history was more common in patients in the age range of 18-65 years. Women attempted suicide more often than men. A history of multiple drug abuse and alcoholism was more common in the men who attempted suicide than in the women. Fewer attempts occurred in February and on Wednesdays. [Emergencias 2012;24:121-125]

**Key words:** Suicide. Suicide, attempted.

## Introduction

Suicide is a major cause of death worldwide, with a yearly incidence of 10-20 per 100,000 population<sup>1</sup>. In Spain, suicide statistics are mainly based on death certificates and judicial inquiries, and the annual rate of suicide is estimated at 8.7 per 100,000 population<sup>2</sup>. The region of Galicia, together with Asturias, has one of the highest rates in Spain, estimated to be about 11.3 per 100,000 population<sup>3</sup>. Within Galicia, in the province of Pontevedra, the rate is about 8.9 per 100,000 population, again similar to national rate, although there are no specific data for the Health Area do Salnés (which is where the present study was carried out). These data place suicide among the 10 leading causes of death in Spain and make it the leading cause of violent death, ahead of traffic accidents<sup>4</sup>.

In contrast, there are few data regarding attempted suicide, although different authors have estimated that unsuccessful attempts occur 10-40 times more frequently than fatal attempts<sup>5,6</sup>. The objectives of the present study were: 1) to determine the rate of attempted suicide in the do Salnés Health Area, hitherto unknown, and whether this rate is higher than expected based on estimates published in the literature, and 2) to describe the different epidemiological characteristics of these patients.

## Method

We performed a retrospective, descriptive, cross-sectional study of all episodes of suicide attempts treated in the emergency department (ED) of Hospital do Salnés during a period of 5

years (2005-2009). The Hospital belongs to the province of Pontevedra and serves the following populations: Cambados, Catoira, Illa de Arousa, Ribadumia, Vilagarcía de Arousa and Vilanova de Arousa. In this area the birth rate is one of the highest in the region of Galicia, and there is a large immigrant population; the population increased by 2.8% during the study period (from 73,822 to 75,890 inhabitants). The study met the ethical criteria and was approved by the hospital Teaching Commission and the hospital Management.

For the selection of the patients we performed a data search of medical diagnoses at discharge, stored in the database MBDS (Minimum Basic Data Set) of do Salnés Hospital, where we introduced key terms relating to suicidal behavior: suicide, attempted suicide, self harm and autolysis. The search was limited to episodes seen in the ED during the study period. We then reviewed the medical records and included all patients who had manifested suicidal behavior. The information obtained from each clinical event was recorded in a data collection sheet, including the following variables: time of patient attention (time of day, day of the week, month and year), age and sex, history of psychiatric problems, alcohol and substance abuse, and previous suicide attempts.

We determined the frequency of attempts in the population, in men and women, in different age groups and the existence of psychiatric history, alcoholism, drug addiction and previous attempts. We also determined the hourly, weekly and monthly distribution of such attempts. We investigated possible relationships between patient gender and age, the presence of psychiatric history, alcoholism, drug addiction and prior attempts, and the homogeneity of these attempts over the year, days of the week and time of day. Results were analyzed using chi-square test, with Yates correction when necessary, or Fisher exact test with 2x2 contingency tables. Differences with a p value <0.05 were considered statistically significant. All statistical analyses were performed

using the Statistical Package for Social Sciences, version 15.0 (SPSS Inc, Chicago, IL, USA).

## Results

We recorded 285 suicide attempts in the study period, all corresponding to inhabitants of the areas served by our hospital, with the exception of twenty cases from outside the area, but these were inhabitants at the time of the attempt. Two patients were excluded due to absence of information about the episode or lack of evidence that the episode was in fact due to suicidal behavior. Table 1 shows the distribution of cases in terms of years of the study. As can be seen, the number of suicide attempts increased progressively during the study period, and came close to doubling the baseline frequency in the last year. Overall, this would mean a rate of 76.1 suicidal attempts per 100,000 population per year. Mean age of our sample was 35 years (SD: 15). A noteworthy finding was not a single case of attempted suicide during the study period in men under 18 years of age.

In the age group 18-35 years, attempted suicide was significantly more frequent in men than in women (Table 2), and therefore differed from the general trend of female predominance. Finally, we detected a higher overall frequency of attempts in women (1.4 times) than in men.

Most patients (74%) had a history of psychiatric problems, and a history of polydrug use or alcoholism was also a common finding in these patients (Table 3). Previous attempts at suicide were found in 46.7% of cases, and psychiatric history included anxiety depressive syndrome (43.9%). This background of polydrug use and alcoholism was significantly more frequent in male patients, but analysis showed it was not homogenous and varied according to age group. Psychiatric history and previous attempts at suicide were more frequent in middle-age patients while a history of alcoholism was more frequent in the elderly with not a single case in the under 35 years age group, and no cases of polydrug use were detected.

**Table 1.** Suicide attempts (SA) recorded in the study period 2005-2009. Population and volume of emergencies treated in that period.

Year	Population	Emergencies	SA	Rate of SA (per 100,000 pop.)	% SA with respect to other emergencies
2005	73,822	30,703	44	59.6	0.14
2006	74,561	35,986	42	56.3	0.12
2007	74,881	37,805	58	77.4	0.15
2008	75,305	36,313	61	81.0	0.17
2009	75,890	38,100	80	105.4	0.21

**Table 2.** Distribution of suicide attempts based on age and sex (p <0.05 for the global distribution)

	Total (n = 285) N (%)	Male (n = 117) N (%)	Female (n = 168) N (%)
< 18 years	11 (3.9)	0 (0)	11 (6.5)
18-34 years	134 (47)	62 (53)	72 (42.9)
35-65 years	126 (44.2)	49 (41.9)	77 (45.8)
> 65 years	14 (4.9)	6 (5.1)	8 (4.8)

ted in minors or in retired patients (Table 3). The concurrence of previous attempts at suicide and psychiatric history in our series was very high (97%), but were first attempts at suicide.

Finally, the temporal analysis of the data (Table 4) showed an uneven distribution for months of the year (incidence was lowest in February) and days of week (incidence was lowest on Wednesdays).

**Discussion**

The rate of suicide attempts recorded in our study was lower than expected. As mentioned above, the rate of unsuccessful attempted suicide is estimated to be 10-40 times that of suicide, and the rate of known suicides in the province of Pontevedra is around 8.9 cases per 100,000. It is interesting to observe that the population increased by 2.8% during the 5-year study period but the increase in suicide attempts was 81.8%. However, the study design did not allow us to determine the reason for this large increase; there may be uncontrolled factors in this retrospective design that help explain these findings, which should be investigated in future studies. Other authors have also found significantly increased rates of suicide attempts in recent years. Pastó Cardona et al.<sup>7</sup> compared the number of poisonings treated in an ED over a period of 10 years, between 1994 and 2004, and found that a large increase in poisonings depended precisely on the increase in suicide attempts. Specifically, the increase over that period was 164.5%, without this being related to population growth.

**Table 4.** Number of suicide attempts treated according to month of the year, day of the week and ED shift

	No attempts	% attempts (95%IC)	p
Month of the year			
January	17	6 (3.2-8.7)	NS
February	14	4.9 (2.4-7.4)	p < 0.05
March	22	7.7 (4.6-10.8)	NS
April	19	6.7 (3.7-9.5)	NS
May	31	10.9 (7.2-14.5)	NS
June	20	7.0 (4.0-9.9)	NS
July	27	9.5 (6.0-12.8)	NS
August	32	11.2 (7.5-14.9)	NS
September	30	10.5 (6.9-14)	NS
October	27	9.5 (6.0-12.8)	NS
November	19	6.7 (3.7-9.5)	NS
December	27	9.5 (6-12.8)	NS
Day of the week			
Monday	49	17.2 (12.8-21.5)	NS
Tuesday	36	12.6 (8.7-16.4)	NS
Wednesday	27	9.5 (6.7-12.8)	p < 0.05
Thursday	43	15.1 (10.9-19.2)	NS
Friday	40	14.0 (10.0-18.0)	NS
Saturday	44	15.4 (10.2-19.6)	NS
Sunday	46	16.1 (11.8-20.4)	NS
Time of day			
Morning	85	29.8 (24.5-35.1)	NS
Afternoon	90	31.6 (26.1-36.9)	NS
Night	110	38.6 (32.9-44.2)	NS

NS: Not significant.

Suicide attempts in our study were higher in women (1.4 times), a trend already described by various authors<sup>8-10</sup>. Some studies have reported a frequency three times higher in women than in men<sup>8</sup>. These data cannot be extrapolated to accomplished suicides, whose frequency is much higher in men (four times higher)<sup>9,11,12</sup>. The mean age of our sample (35 years) is very similar to that reported elsewhere<sup>9,13</sup>.

As for medical/psychiatric history, the data on our patients is also consistent with those reported in the literature. Psychiatric disease is known to be the most important risk factor for suicide and attempted suicide<sup>14-18</sup> and that over 90% of suicides occur in people with defined psychiatric diseases. Within these the most common is depressive disorder<sup>19,20</sup>, which is present in 80% of all suicides, followed by substance abuse (including alcoholism), and schizophrenia<sup>21-23</sup>. Given that

**Table 3.** Relevant history of patients in the series and comparison by gender and age

	Sex			p	Age				p
	Total (n = 285) N (%)	Male (n = 117) N (%)	Female (n = 168) N (%)		< 18 years (n = 11) N (%)	18-34 years (n = 134) N (%)	35-65 years (n = 126) N (%)	> 65 years (n = 14) N (%)	
Psychiatric history	212 (74.4)	80 (68.4)	129 (76.8)	0.07	8 (54.5)	96 (71.6)	103 (81.7)	7 (50)	< 0.05
Alcohol	22 (7.7)	15 (12.8)	7 (4.2)	< 0.01	0 (0)	0 (0)	21 (16.7)	1 (7.1)	< 0.001
Polydrug	35 (12.3)	27 (23.1)	8 (4.8)	< 0.001	0 (0)	24 (17.9)	11 (8.7)	0 (0)	< 0.05
Attempted suicide	133 (46.7)	52 (44.4)	81 (48.2)	0.26	3 (27.3)	60 (44.8)	68 (54)	2 (14.3)	< 0.05

diagnoses made in our ED are not coded according to ICD-10, we preferred not to discuss these issues in detail in order not to commit inaccuracies. Nearly half of our patients (46.7%) had a history of previous attempts, which is also consistent with published data<sup>18</sup>. Indeed, various studies estimate these previous attempts between 30% and 60%<sup>24-26</sup>. In the history of attempted suicide we observed differences according to age groups and the highest frequency was for the age group 35-65 years. However, our study did not show a higher frequency of previous suicide attempts in women than in men.

Several studies have indicated a greater number of accomplished and attempted suicide during Spring<sup>24,27,28</sup> while others indicate Summer as the season of highest risk<sup>29-31</sup> or no particular seasonal trend<sup>32</sup>. In our health area, Dorado Fernandez<sup>27</sup>, who studied accomplished suicides in Cambados, found a greater number in July and August. Analysis of our data showed no seasonal trend, only a lower risk of attempted suicide in the month of February, and for days of the week Wednesday. The time of day was measured indirectly, in relation to ED work shift attention, which may not exactly reflect the time of the suicide attempt. However, this information was objectively recorded and did not depend on patient subjectivity. The results reveal an even distribution of suicide attempts over the three shifts of attention. Naturally we took into account that the night shift was 10 hours, compared with 7 hours of the morning and afternoon shifts, so that the apparently higher frequency observed during the night shift was due to this effect and not statistically significant.

The major limitation of the study is the possibility of inaccuracies. There may have been more cases of attempted suicide that did not attend our ED (i.e. cases resolved by outpatient psychiatric consultation or primary care centers, without involving the ED), leading to underestimation of the number of total attempts. However, we believe that this would only involve a low number of cases since treatment protocols in our health area recommend urgent specialized evaluation, which is only available through the ED and there is only one ED in our area. Unfortunately, this is a weakness inherent to most studies addressing suicide. It is also possible that some cases were not included due to coding errors in the ED report.

Despite these limitations, some conclusions applicable to the health care area do Salnés can be drawn from the study. First, the rate of attempted suicide in the Health Area do Salnés was 76.1 at-

tempts per 100,000 inhabitants per year during the period 2005-2009. Second, the frequency of attempted suicide in the area was 1.4 times higher in women than men, although this is not applicable to all age groups. Third, most of those who attempted suicide had a history of psychiatric disease and half had previous attempts. Finally, fewer suicide attempts occurred on Wednesdays and in the month of February.

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## Análisis de los aspectos epidemiológicos de las tentativas de suicidio en un área sanitaria desde la perspectiva de un servicio de urgencias

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**Objetivos:** Determinar la tasa de tentativas de suicidio del Área Sanitaria do Salnés atendidas en su servicio de urgencias de referencia y analizar diferentes variables epidemiológicas.

**Método:** Estudio retrospectivo en el que se registraron todas las tentativas de suicidio durante un periodo de 5 años atendidas en urgencias, de las cuales se recogió el día y la hora de la atención en urgencias, así como la edad, el sexo, los antecedentes de la patología psiquiátrica, el alcoholismo, la toxicomanía y los intentos de suicidio previos en el paciente.

**Resultados:** Se registraron 285 tentativas de suicidio (tasa de 76,1 por 100.000 habitantes y año): la edad media fue de  $35 \pm 15$  años y el 58,9% eran mujeres. Se detectaron antecedentes psiquiátricos en el 74,4% de los pacientes, y el 46,7% tenía antecedentes de intento de suicidio, y estos antecedentes se concentraban más en las edades medias de la vida (18-65 años). Las mujeres fueron más proclives a realizar tentativas y, entre los hombres que lo intentaron, el antecedente de politoxicomanía y alcoholismo estuvo más presente que en las mujeres. Se detectó una menor probabilidad de intento de suicidio en el mes de febrero y los miércoles.

**Conclusiones:** Los servicios de urgencias permiten calcular las tasas de tentativas de suicidio de su área de referencia y establecer las características fundamentales de dichas tentativas. [Emergencias 2012;24:121-125]

**Palabras clave:** Suicidio. Tentativa de suicidio. Intento autolítico.