ORIGINAL ARTICLE

Prehospital Management of Suicide Attempts and Predictive Factors of Mortality Identified During Medical Dispatching

Prise en charge préhospitalière des tentatives de suicides et facteurs prédictifs de mortalité identifiés dès la régulation médicale

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Abstract

Background: Prehospital management of suicide attempts (SA) is increasing worldwide and in Tunisia. This study aimed to describe the management of SA in the prehospital setting, and to analyze factors predicting mortality during medical dispatching.

Methods: We conducted a retrospective descriptive and analytical study including all SA-related calls managed by the Prehospital Emergency Medical Services (PEMS) between January 2023 and December 2024. We described patients' socio-demographic and clinical characteristics, medical dispatch decisions, prehospital management, and analyzed factors associated with prehospital mortality.

Results: The sex ratio was 0.68, and the mean age was 29.6 years. Voluntary intoxication was the most common method (88.8%), followed by hanging (9.6%). A Mobile Intensive Care Unit (MICU) was deployed in 78.4% of cases. In univariate analysis, rural origin (p=0.012), calls made by medical personnel (p<0.001), and medical management initiated prior to MICU arrival (p=0.04) were significantly associated with reduced mortality. In contrast, hanging (p<0.001), calls received within the first hour following the SA (p=0.014), and calls made by Civil Protection Services (CPS) personnel (p=0.023) were associated with increased mortality. In multivariate analysis, hanging(p=0.04 ;OR=2.12 ;IC=[1.28-16.1]) and early received calls (p=0.01 ;OR=8.33 ;IC=[1.76-91.4]) remained independent predictors of mortality, whereas rural origin (p=0.03 ;OR=0.16 ;IC[0.015-0.67])and prior medical management(p=0.03 ;OR=0.33 ;IC=[0.03-0.73]) were protective.

Conclusion: Early identification of mortality-related factors in SA may strengthen medical dispatch decision-making. Strengthening the role of PEMS in early management could further improve patient outcomes.

Keywords: suicide attempt, intoxication, prehospital, mortality.

Résumé

Introduction: La prise en charge préhospitalière des tentatives de suicide (TS) connaît une augmentation dans le monde et en Tunisie.Cette étude visait à décrire leur prise en charge préhospitalière et à analyser les facteurs prédictifs de mortalité dès la régulation médicale.

Méthodes: Étude rétrospective descriptive et analytique incluant tous les appels pour TS traités par le service d'aide médicale urgente (SAMU) entre janvier 2023 et décembre 2024. Les caractéristiques sociodémographiques, cliniques, les décisions de régulation médicale et la prise en charge ont été analysées, ainsi que les facteurs associés à la mortalité préhospitalière.

Résultats: Le sex-ratio était de 0.68 et l'âge moyen de 29,6 ans.L'intoxication volontaire était la méthode la plus fréquente(88.8 %), suivie de la pendaison(9.6 %).Un Service Mobile d'Urgence et de Réanimation (SMUR) a été engagé dans 78.4 % des cas. En analyse univariée, l'origine rurale(p=0.012), l'appel par un professionnel de santé(p<0.001) et une prise en charge initiée avant l'arrivée du SMUR(p=0.04) étaient associés à une réduction de la mortalité. La pendaison(p<0.001), l'appel dans la première heure(p=0.014),et les appels par la Protection Civile(p=0.023) étaient liés à la mortalité. En analyse multivariée, la pendaison(p=0.04;OR=2.12;IC=[1.28-16.1]) et l'appel précoce(p=0.01;OR=8.33;IC=[1.76-91.4]) constituaient des facteurs indépendants de mortalité, tandis que l'origine rurale(p=0.03;OR=0.16;IC=[0.015-0.67]) et une prise en charge initiale(p=0.03;OR=0.33;IC=[0.03-0.73]) demeuraient protectrices.

Conclusion : L'identification précoce des facteurs de mortalité dans les TS pourrait améliorer les décisions de régulation médicale. Le renforcement du rôle des SAMU dans la prise en charge précoce pourrait également améliorer le pronostic des patients.

Mots-clés: tentative de suicide, intoxication, préhospitalier, mortalité.

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LA TUNISIE MEDICALE-2026; Vol 104 (04): 551-558 DOI: 10.62438/tunismed.v104i04.6402

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Introduction

In Tunisia, recent data showed an increase in the incidence of suicide attempts after the 2011 revolution (1). Self-poisoning is one of the most frequently encountered presentations managed by Prehospital Emergency Medical Services (PEMS) (2). Prehospital management of Suicide attempts (SA) plays a crucial role in reducing mortality and morbidity, however practices differ substantially worldwide. It represents a considerable challenge and requires prompt decisions from the moment the call is received at the Emergency Medical Dispatch Center (EMDC) until the prehospital team arrives on scene. This study aims to describe the management of SA in the prehospital setting, and to analyze factors predicting mortality identified during the emergency medical dispatch phase.

Methods

We conducted a descriptive, retrospective study within the PEMS of Habib Bourguiba University Hospital in Sfax, Tunisia. The study included all SA related calls received between January 2023 and December 2024. This PEMS covers the governorates of Sfax and Sidi Bouzid.

Study population

We included all calls related to any form of SA managed by the EMDC of PEMS 04 Sfax. The diagnosis of SA was established by the medical dispatcher based on information obtained during the telephone interview. Patients identified as being in cardiac arrest prior to the PEMS call were considered completed suicides and were therefore excluded. Cardiac arrest diagnosis was based on the medical dispatcher's interview and the caller's description. Cases of unintentional intoxication were also excluded.

Collected data

Data were extracted from the medical records of included patients. The following variables were collected: Sociodemographic characteristics : age, sex, origin, psychiatric and somatic medical history. Circumstances of the SA: triggering factors and method used. Variables related to medical dispatching: type of caller, date and time of the call, and the medical dispatcher's decision. Mobile Intensive Care Unit (MICU) interventions related data: clinical findings upon arrival and treatments provided.

Statistical data analysis

All statistical analysis were performed using SPSS version 20. In the descriptive phase of the study, qualitative variables were summarized using frequencies and percentages. Quantitative variables with a normal distribution were expressed as means with standard deviations, whereas non-normally distributed variables were reported as medians with interquartile ranges. In the analytic phase, we compared patients who died following the SA and those who survived, in order to identify potential associations across the various studied parameters. For comparisons of frequencies (percentages), Pearson's Chi-squared test was used. When any expected cell count was below 5, Fisher's exact test was applied. The Mann–Whitney U test was used to compare continuous variables with non-Gaussian distributions, whereas the Student's t-test was applied for variables following a Gaussian distribution. A significance level of 5% was adopted; associations were considered statistically significant when $p \leq 0.05$. No effect-modifying variables or confounding factors were identified in the analysis. To identify mortality risk factors directly associated with SA, multivariate analysis was performed using logistic regression. The strength of each association was expressed using an odds ratio (OR) with a 95% confidence interval. An OR greater than 1 indicated a strong association. The goodness-of-fit of the final logistic regression model was assessed using the Hosmer–Lemeshow test. A non-significant result ($p > 0.05$) indicates good agreement between the predicted and observed probabilities, whereas a significant result ($p \leq 0.05$) suggests poor calibration. The predictive performance of the mortality model was evaluated using the Receiver Operating Characteristic (ROC) curve, which is a tool for evaluating the performance of a classification model. The Area Under the Curve (AUC) ranges from 0 to 1 and reflects the model's ability to distinguish between patients who died and those who survived. An AUC of 0.5 indicates no discriminative ability (equivalent to chance), values between 0.7 and 0.8 indicate acceptable discrimination, values between 0.8 and 0.9 indicate very good performance, and values above 0.9 are considered excellent.

Results

Descriptive study

Frequency: A total of 116 patients were included. The prevalence of SA related calls during the study period was 0.01% out of 13 034 calls received. (Fig.1)

Socio-demographic characteristics: The mean age of individuals who attempted suicide was 29.6 years (±13.5), 33 years (±14) in males and 27 years (±13) in females. Ages ranged from 13 to 68 years. The overall male to female ratio was 0.68. A peak incidence of 40.5% (n=49) was observed in the 16-25 year age group for both sexes. Patients aged under 46 years accounted for 87.9% of all SA (n=102). Most calls originated from rural areas (n=74; 63.8%).

Comorbidities: Psychiatric comorbidity was found in 23 patients (19.8%), among whom 30.4% (n=7) were off treatment. History of SA was found in 16 patients (13.8%), including 9 who had made more than one attempt. Somatic comorbidities were identified in 10 patients (8.6%): 3 with epilepsy, 2 with diabetes mellitus,

1 with coronary artery disease, 1 with heart failure, 1 with chronic kidney disease, 1 with an unspecified brain tumor, and 1 patient with a history of pulmonary embolism.

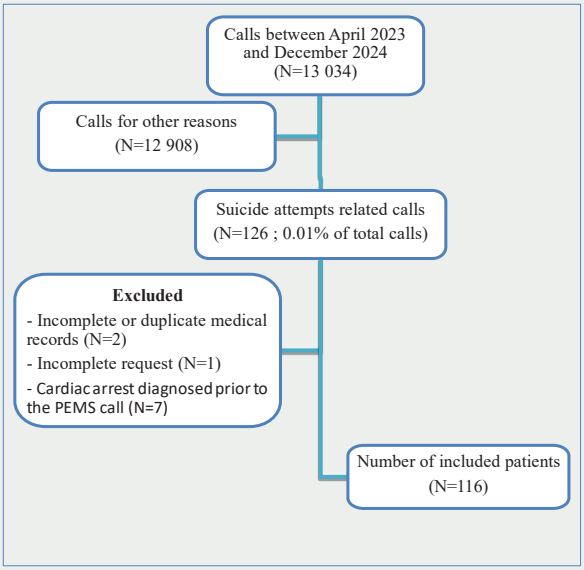


Figure 1. Study flow chart
PEMS: Prehospital Medical Emergency Services

Circumstances and methods of SA: The characteristics of the SA are summarized in Table 1 (Tab.1). The most common method was drug intoxication (n=43; 37%) followed by organophosphate (OP) ingestion (n=45; 38.8%).

Table 1. Distribution of patients by characteristics of suicide attempts

Characteristics of suicide attempts	Items	N (%)
Triggering factors		**27 (23.3)**
	Family conflict	20 (74.1)
	Psychotic decompensation	4 (14.8)
	Stressful life event	2 (7.4)
	School failure	1 (3.7)
Methods of suicide attempts	**Voluntary intoxication**	**103 (88.8)**
	Organophosphate (OP)	45 (43.7)
	Drugs	43 (41.7)
	Caustic agents	7 (6.8)
	Paraphenylenediamine (PPD)	6 (5.8)
	Butane inhalation	1 (1)
	Multi-intoxication	1 (1)
	Hanging	8 (6.9)
	Self-immolation	2 (1.7)
	Self-mutilation	2 (1.7)
	Electric injury	1 (0.9)

The substances most frequently used for voluntary intoxication differed depending on patients' origin. (Tab.2) The medications involved in drug intoxication are summarized in Table 3. (Tab.3) The presumed ingested dose was reported in only 30.2% of patients (n=13), and it was within the toxic range in 30.8% (n=4) of them: paracetamol (12 g in one patient and 10 g in another), sodium valproate (5 g), and bisoprolol (30 g). The remaining 69.8% of patients (n=30) refused to disclose the ingested dose.

Table 2. Distribution of patients by type of intoxication and origin

Intoxication type	Urban origin		Rural origin	
	N	%	n	%
Drugs	20	64.5	23	31.9
Organophosphate (OP)	6	19.4	39	54.2
Caustic agents	3	9.7	4	5.6
Paraphenylenediamine (PPD)	0	0.0	6	8.3
Multi-intoxication	1	3.2	0	0.0
Butane inhalation	1	3.2	0	0.0
Total	31	100	72	100

Table 3. Distribution of medications used in voluntary drug intoxications

Medication class	N (%)
Psychotropics	18 (41.9)
Neuroleptics	2 (4.7)
Benzodiazepines	8 (18.6)
Antiepileptics	2 (4.7)
Antidepressants	6 (14)
Antidiabetics	3 (7)
Cardiotropic drugs	2 (4.7)
Analgesics	2 (4.7)
Anti-inflammatory drugs	1 (2.3)
Not identified	4 (9.3)
Multiple drugs	13 (30.2)
Total	43 (100)

Medical dispatching: Most calls originated from regional hospitals (n=53; 45.7%). Calls from third parties, primary health care centers and private physicians represented 29.3% (n=34), 11.2% (n=13) and 7.8% (n=9) respectively. Regarding the timing of SA, it occurred mostly in January (n=23; 19.8%), followed by a second peak in August (n=14; 12.1%). Monday was the most frequent day of occurrence (n=26; 21.5%), whereas Tuesday recorded the fewest cases (n=9; 7.4%). The time interval between the SA and the emergency call was less than one hour in 37.1% of cases (n=43). The medical dispatcher responded to the call by deploying a MICU (n=91; 78.4%) when the situation was assessed as life threatening, i.e., a primary on-site mission. His assessment was based on the information obtained during the phone interview, including the patient's clinical condition, location, and the method of the SA. In cases of intoxication, the dispatcher additionally considered the time interval between the ingestion and the call, as well as the type and dose of the toxic agent, to evaluate the severity of the case. Table 4 illustrates the distribution of patients by medical dispatch decisions and methods of SA. (Tab.4)

Table 4. Distribution of patients by medical dispatch decisions and methods of suicide attempts

Suicide attempts methods		Medical dispatch decisions							
		MICU[1]		NEMT[2]		Medical advice		Self-referral by private vehicle	
		n	%	N	%	n	%	n	%
Intoxication	Organophosphates	37	31.9	7	6.0	1	0.9	0	0.0
	Drugs	29	25.0	2	1.7	3	2.6	9	7.8
	Paraphenylenediamine	6	5.2	0	0.0	0	0.0	0	0.0
	Caustic agents	4	3.4	1	0.9	0	0.0	2	1.7
	Multi-intoxication	1	0.9	0	0.0	0	0.0	0	0.0
	Butane inhalation	1	0.9	0	0.0	0	0.0	0	0.0
Hanging		8	6.9	0	0.0	0	0.0	0	0.0
Self-immolation		2	1.7	0	0.0	0	0.0	0	0.0
Self-mutilation		2	1.7	0	0.0	0	0.0	0	0.0
Electric injury		1	0.9	0	0.0	0	0.0	0	0.0
Total		91	78.4	10	8.6	4	3.4	11	9.5

1: Mobile Intensive Care Unit deployment, **2**: non-emergency medical transport

Prehospital assessment: All patients who benefited from a MICU intervention were assessed on scene by an emergency medicine physician (n=91; 78.4%). Among these patients, eight were found in cardiac arrest (8.8%). Hanging was the most frequent suicide method in this subgroup (n=4; 50%). The remaining four cases involved butane inhalation, self-immolation, self-mutilation and electric injury. Return of spontaneous circulation (ROSC) was achieved in two of the eight cardiac arrest cases following cardiopulmonary resuscitation (CPR). In the 83 cases (91.2%) not presenting in cardiac arrest, prehospital assessment followed the ABCDE approach. No complete upper airway obstruction was observed; however, the airway was at risk of obstruction in 28 cases (33.7%). Respiratory distress was identified in 14 patients (16.9%), and hemodynamic instability was found in 6 patients (7.2%). Electrocardiography was performed in 13 cases (15.7%). The mean Glasgow Coma Scale (GCS) was 11.8 ± 4.3, with neurologic distress present in 27 patients (32.5%). Packaging of the intoxicant was found in six cases (7.2%). Regarding hanging, the rope has been removed from the neck in two cases (2.4%). Regarding self-immolation, one patient sustained third-degree burns affecting approximately 50% of the body surface area, including the face, neck, thorax, abdomen, pelvis and thighs.

Prehospital management: Preliminary medical care was initiated prior to the arrival of the MICU in 39 cases (42.9%), most frequently by regional hospitals (n=25; 27.5%). Once on scene, the MICU provided advanced interventions, including supplemental oxygen in 33 cases (39.8%), among whom 31 patients (37.3%) required mechanical ventilation. Forty patients (48.2%) had benefited from intravenous fluid resuscitation with 9‰ saline serum. The use of vasoactive drugs was necessary in four patients (4.8%), exclusively using norepinephrine. Digestive decontamination was performed in 20 patients (24.1%), of whom five cases (25%) had already undergone initial gastric lavage as a part of preliminary care. No administration of activated charcoal by prehospital teams was reported. Regarding antidotal treatment, atropine and pralidoxime methylsulfate were administered in four (4.4%) and six (6.6%) cases respectively.

Outcomes: We analyzed outcomes for all primary on-site missions, corresponding to MICU interventions (n=91). During transport, six patients (7.1%) had their medical condition worsened, including two who developed cardiac arrest with no ROSC and subsequently died (2.4%). Regarding final disposition, most patients were admitted to an intensive care unit (ICU) (n=75; 82.4%). Among them, 44 patients (48.4%) were oriented to the ICU of Habib Bourguiba University Hospital in Sfax. Seven patients (7.7%) were transferred to the outpatient emergency department of the same hospital.

Overall mortality: Eight cases resulted in completed suicide (i.e., SA leading to death), accounting for 8.8% of all primary on-site missions and 6.9% of the overall study population.

Analytic study

Univariate analysis: Rural origin (p=0.012) and medical management initiated prior to the MICU arrival (p=0.04) were significantly associated with a reduced risk of mortality. Calls made by medical personnel were also protective (p<0.001). In contrast, hanging (p<0,001) and calls received within the first hour following the SA (p=0,014) were significantly associated with increased mortality. Calls made by Civil Protection Services (CPS) personnel were also associated with higher mortality (p=0,023). Table 5 illustrates the association between mortality and different variables examined. (Tab.5)

Table 5. the association between mortality and different variables examined in univariate analysis

	Variable	Mortality= yes n (%)	Mortality= no n (%)	P-value	OR	CI 95%
Sociodemographic characteristics	**Age**					
	≤ 35	4 (50.0)	55 (66.3)	0.8	-	-
	]35 - 55]	3 (37.5)	23 (27.7)	0.46	-	-
	> 55	1 (12.5)	5 (6.0)	0.09	-	-
	Sex					
	Male	6 (75.0)	34 (41.0)	0.23	-	-
	Female	2 (25.0)	49 (59.0)			
	Origin					
	Urban	7 (87.5)	28 (33.7)	0.012	0.08	[0.01-0.76]
	Rural	1 (12.5)	55 (66.3)			
Comorbidities	**Previous SA**					
	Yes	1 (12.5)	65 (78.3)	0.32	-	-
	No	7 (87.5)	18 (21.7)			
	Psychiatric comorbidities	2 (25.0)	16 (19.3)	0.54	-	-
	Somatic comorbidities	1 (12.5)	7 (8.4)	0.65	-	-
Characteristics of SA	**Psychiatric treatment**					
	Off medication	0 (0.0)	0 (0.0)	0.8	-	-
	On medication	2 (25.0)	9 (10.8)			
	Triggering factors					
	Family conflict	1 (12.5)	17 (20.5)	0.7	-	-
	Psychotic decompensation	0 (0.0)	4 (4.8)	0.55	-	-
	School failure	0 (0.0)	1 (1.2)	0.7	-	-
	SA methods					
	Hanging	4 (50.0)	4 (4.8)	0.014	11.8	[2.06-68.1]
	Self-immolation	1 (12.5)	1 (1.2)	0.14	-	-
	Electric injury	1 (12.5)	0 (0.0)	0.07	-	-
	Intoxication : Drugs	0 (0.0)	30 (36.1)	0.34	-	-
	OP	0 (0.0)	37 (44.6)	0.3	-	-
	Caustic agents	0 (0.0)	4 (4.8)	0.55	-	-
	PPD	0 (0.0)	6 (7.2)	0.46	-	-
Timing of call	< H1	7 (87.5)	29 (34.9)	0.014	10.8	[1.24-93.9]
	[H1 – H2]	0 (0.0)	7 (8.4)	0.42	-	-
	> H2	1 (12.5)	47 (56.6)	0.42	-	-
The caller	Medical personnel	0 (0.0)	58 (69.9)	<0.001	0.78	[0.66-0.94]
	CPS personnel	3 (37.5)	1 (1.2)	0.023	16.4	[1.89-141.9]
	Police agents	1 (12.5)	1 (1.2)	0.14	-	-
	Third party callers	4 (50.0)	23 (27.7)	0.11	-	-
Preliminary medical care	Present	1 (12.5)	39 (47.0)	0.04	0.16	[0.019-0.36]
	Absent	7 (87.5)	44 (53.0)			

OR: Odds ratio; **CI 95%**: Confidence interval at 95% of the odds ratio; **SA**: Suicide attempt; **OP**: Organophosphate; **PPD**: Paraphenylenediamine; **CPS**: Civil Protection Services

Multivariate analysis: In the multivariate model, the factors independently associated with increased mortality among SA were calls received within the first hour following the attempt (p=0.01; OR=8.33; CI=[1.76–91.4]) and hanging as the method of SA (p=0.04; OR=2.12; CI=[1.28 – 16.1]). Conversely, rural origin (p=0.03; OR=0.16; CI=[0.015-0.67]) and medical management initiated prior to MICU arrival (p=0.03; OR=0.33; CI=[0.03-0.73]) were identified as protective factors. (Tab.6).

According to the ROC curve, the model demonstrated a very good performance in predicting mortality and discriminating patients at risk of death, with an AUC of 0.86 (p=0.002; CI=[0.73 – 0.98]) (Fig.2). Sensitivity was 71% and specificity was 68%. The Hosner-Lemeshow goodness-of-fit test was non-significant (p= 0,93), indicating adequate model calibration.

Table 6. the association between mortality and different variables examined in multivariate analysis

Variable	P-value (multivariate)	OR	CI 95%
Rural origin	0.03	0.16	[0.015 – 0.67]
Timing of call < H1	0.01	8.33	[1.76 – 91.4]
Hanging	0.04	2.12	[1.28 – 16.1]
Call by medical personnel	0.98	-	-
Call by CPS personnel	0.99	-	-
Preliminary medical care	0.03	0.33	[0.03-0.73]

OR: Odds ratio; **CI 95%**: Confidence interval at 95% of the odds ratio; **CPS**: Civil Protection Services

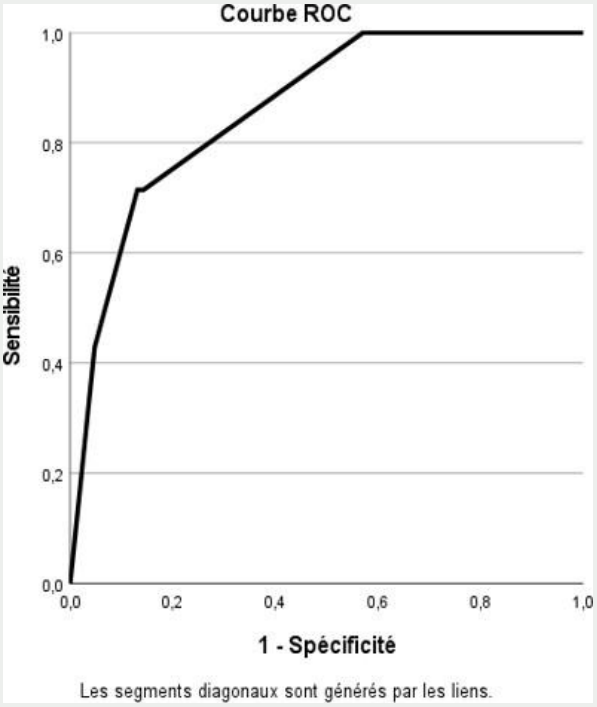


Figure 2. ROC curve

Discussion

SA remain a major global public health concern, with a disproportionate burden observed in low- and middle-income countries (3, 4). To our knowledge, our study is the first in Tunisia to specifically assess SA from a prehospital perspective, providing valuable operational insights for emergency medical services.

Sociodemographic Profile

Most SA involved individuals aged 16–25 years, aligning with regional and international data indicating the high vulnerability among adolescents and young adults experiencing acute relational, academic, or socioeconomic distress (5–8). International variations in age distribution can be explained by cultural differences and by the higher prevalence of psychiatric disorders in high-income countries, where a later peak of suicidal behavior is often observed (4, 8). The predominance of females among SA and males among completed suicides is consistent with well-established patterns: women tend to use less lethal methods such as poisoning, whereas men more frequently employ violent methods such as hanging (9–11). The sex differences observed between rural and urban areas represent an original finding of our study. The higher proportion of female attempts in rural regions may relate to increased exposure to family conflict and easier access to pesticides, while the male predominance in urban areas may reflect socioeconomic pressures associated with city life (12, 13). Although the literature describes higher suicide risk and mortality in rural settings (14–17), our study paradoxically found lower mortality among rural patients. This finding is likely explained by differences in the lethality of methods: in our region, poisoning—more common in rural areas—is generally more amenable to successful resuscitation than hanging, which predominated among urban fatalities (18, 19).

Circumstances and Methods

Family conflict was the leading triggering factor, consistent with findings of studies conducted in Mediterranean settings (20–22). Voluntary poisoning was the most frequently used method, while hanging remained the most lethal, a pattern widely reported across various settings (23–24). The use of OP in rural areas, as previously reported in Asia and Africa (5, 25), reflects their accessibility in agricultural environments. These toxins rapidly induce respiratory compromise through bronchorrhea and an increased risk of aspiration (26), explaining the high proportion of airway obstruction observed in our cohort.

Emergency Calls and Medical Dispatching

Regional hospitals were the main source of emergency calls, likely reflecting the hierarchical structure of the Tunisian healthcare system (27). Calls made by medical personnel were associated with reduced mortality, highlighting the importance of early clinical triage and timely recognition of severity. Conversely, calls originating from non-medical services—particularly CPS—were associated with higher mortality, probably due to delays in initial clinical assessment. Interestingly, calls received within the first hour were associated with greater mortality. This finding most likely reflects the extreme severity of these cases (e.g., hanging, cardiac arrest) which trigger immediate mobilization, rather than any harmful effect of early prehospital intervention, a pattern previously described in studies on prehospital timing (28).

Prehospital Management

Approximately 9% of patients were in cardiac arrest, predominantly following hanging, a finding consistent with international data (29). Endotracheal intubation was primarily indicated to prevent aspiration, particularly in cases of severe poisoning, which is consistent with the respiratory risks associated with OP exposure (24). The overall use of antidotes was low, notably atropine. Several factors likely contributed to this finding. First, many antidotes are unavailable in the MICU, a limitation previously described in other middle-income countries (30). Second, many patients presented with moderate poisoning, for which immediate atropine administration is not always indicated. Additionally, in some cases, initial treatment had already been initiated prior to our team's arrival. Finally, the absence of oximes in prehospital equipment limited optimal management of OP toxicity. This situation stands in contrast with international recommendations that emphasize early and aggressive atropine administration to reduce mortality (31, 32). These findings highlight the need to strengthen the

pharmacological resources available in Tunisian MICU. Gastric lavage was performed in 24% of patients, comparable to rates reported in certain regions of Africa and Asia (25, 33), but higher than in Western countries, where this procedure is rarely recommended (34). This difference reflects the high prevalence and lethality of pesticide poisoning in our context, as well as the specific recommendations supporting gastric lavage following OP ingestion (34, 35). Activated charcoal was also administered when ingestion was recent and the toxin was absorbable, contributing to early gastrointestinal decontamination.

Outcome and Transport

Most patients were transported by a medicalized ambulance, a high yet expected rate in healthcare systems where severe poisonings constitute a primary indication for advanced medical transport (30). The substantial proportion of patients requiring intensive care admission reflects the severity of the clinical presentations encountered.

Limitations of the study

This study has several limitations. First, the small number of cases can be regarded as a limitation of this study. First, most of the research site was in the regions of Sfax and Sidi Bouzid. Thus, the findings could not be generalized to the other regions of Tunisia. Second, this study revealed a discrepancy in the methods used in SA depending on the geographic area whether urban or rural, but without precising the exact location.

Conclusion

SA represent a significant cause of mortality and morbidity, particularly in low and middle-income countries. Our study highlights that young adults were the most affected population, with poisoning—especially by OP in rural areas—being the most frequent method. These findings underscore the need to strengthen PEMS through improved training, wider availability of antidotes, and early intervention strategies. Additionally, implementing targeted prevention programs, regulating access to highly toxic pesticides in rural settings, and reinforcing the role of PEMS in the initial management of suicide attempts are essential steps to reduce mortality and improve patient outcomes.

Recommendations

1. Strengthen prehospital training and awareness: Continuous training programs should be implemented to enhance the capacity of medical dispatchers to rapidly identify severe SA, recognize mortality-related factors, and initiate early, guideline-based interventions.
2. Ensure systematic availability of essential antidotes and critical equipment: Standardizing antidote inventories and decontamination equipment across all MICU would reduce treatment delays and improve the initial management of toxic exposures frequently involved in SA.
3. Develop decision-support tools for medical dispatchers: Creating a structured triage algorithm or a validated decision-making score specific to SA would help medical dispatchers rapidly assess severity, optimize dispatch strategies, and reinforce the role of PEMS in early management.

List of abbreviations
PEMS: Prehospital Emergency Medical Services
SA: Suicide attempt
EMDC: Emergency Medical Disptach Center
MICU: Mobile Intensive Care Unit
OR: odds ratio
CI: Confidence interval
ROC: Receiver Operating Characteristic
AUC: Area Under the Curve
OP: Organophosphate
ROSC: Return of spontaneous circulation
ICU: Intensive Care Unit
CPS: Civil Protection Services

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