Epidemiological Characteristics of Suicidal Patients Admitted to the Psychiatric Clinic in Kragujevac: A Ten-Year Retrospective Study

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INTRODUCTION

Failed suicide attempt is a suicidal act which does not have a fatal outcome [1], or in other words, failed suicide attempt is an act that could have resulted in death, but did not [2].

Attempted suicide is a significant public health problem [3, 4] associated with high morbidity and health care resources utilization [5]. Suicidal thoughts and suicide attempts are widespread in the community (11-14% and 2.8-4.6%) [6]. It is estimated that somewhere between 200,000 and 1,000,000 people attempt suicide in the U.S per year. [7]. According to the data published by the World Health Organization (WHO), every year approximately 700,000 people in Europe try to commit suicide. The incidence of suicidal ideas (11-14%) is understandably higher than that of actual suicide attempts (2.8-4.6%) [6], which leaves a lot of room for the identification and treatment of these patients. The highest incidence of suicide attempts in Europe is seen in women between 15 and 24 years of age [8]. Data from a U.S. research indicate that for every suicide there are at least 20 suicide attempts [9]. Women are twice as likely as men to attempt suicide, whereas men are four times more likely to commit suicide [9, 10].

The literature shows that 30-47% of patients who attempt suicide have a history of prior attempts [11, 12, 13]. Previous studies have shown that attempted suicide requires our special attention, for it represents the main and most powerful predictor of a new attempt and potential suicide [3, 14, 15]. The risk of death in people who have attempted suicide is as much as hundred times higher than in general population. More than 10% of people repeat suicide attempts, and 61% have a history of suicide attempts for which they were treated [16]. It is estimated that about 10-15% of people who attempt suicide eventually end their lives by committing suicide [15]. The greatest risk of death is within six months from the first attempt, especially in men [3, 17].

Different factors are associated with increased risk of suicide attempts, including mental disorders, family history and history of previous suicide attempts, socio-demographic factors such as gender, age, marital status, and occupation, educational and economic level [17].

Methods of attempting and committing suicide vary greatly and are different through-
out the world. It depends on many factors, including cultural and religious traditions. The most common method of committing suicide is by poisoning and hanging, both in Serbia and other countries. Men are more likely to use firearms as means of committing suicide, while women are more prone to poisoning. In recent years opiates are preferred, being used for deliberate overdosing [18]. Nowadays, a widely held view is that suicide attempts using opiates represent a dominant method of suicide, accounting for more than 90% of cases [16, 19]. The method of committing suicide depends on the person’s psychiatric structure, gender, age and social values. In the literature, drug poisoning is reported as the most common method of attempting suicide, particularly in women [10, 17, 18], with the most commonly used drugs being those in the benzodiazepines group [10].

Suicide attempts and threats should always be taken seriously. About one third of people who attempt suicide will repeat the attempt within a year, and up to 10%-15% of those who threaten or attempt suicide eventually do commit suicide [20]. All these data indicate that special attention should be paid to every identified risk factor [14, 15].

OBJECTIVE

The paper’s objective is to analyze failed suicide attempts in the city of Kragujevac during the period 2001–2010, with reference to certain risk factors. The results obtained in this study may be used not only to analyze the triggers of suicidal behaviour, but also to successfully prevent suicidal behaviour.

METHODS

In this retrospective anamnestic study we analyzed 286 patients (133 men and 153 women) hospitalized and treated between 2001 and 2010 at the Psychiatric Clinic of the Clinical Centre Kragujevac following a failed suicide attempt. Patients who received acute medical care within a few hours without subsequent hospitalization were not included in the analysis. Also, the analysis did not include patients who received medical care in other medical departments of the Clinical Centre Kragujevac. Some patients received medical care at the Emergency Room, others at the Internist Ward; some were discharged to home care, while a certain number of patients, following psychiatrist’s evaluation, were sent to the Psychiatric Clinic of the Clinical Centre Kragujevac. Psychiatric Clinic of the Clinical Centre Kragujevac takes care of patients within the territory of Šumadija/Central Serbia, covering approximately two million people.

Data were obtained from hospital medical records of patients treated in the given period. We analyzed the frequency and distribution of suicide attempts with regard to demographic characteristics (gender, age and place of residence), diseases (conditions that preceded the suicide attempt), suicide attempt method, time of year (day, month, season). The results were processed using standard statistical methods (Chi Square test, Student’s t-test).

RESULTS

In the analyzed period, the average suicide attempt rate per 100,000 inhabitants for the territory of the City of Kragujevac was 21.6. The highest rate was in 2007 with 33.2 attempts, and the lowest in 2005 with 15.9 attempts (Graph 1). There were no statistically significant differences between suicide attempt rates by years of observation ($r=-0.212, p=0.556$).

From a total of 286 people who attempted suicide, 53.5% were female. The research showed that, for the most part of the analyzed period, the number of women who attempted suicide was significantly higher (Graph 2), except for the 2003–2005 period (14 men in 2003 (58.3%), 15 in 2004 (62.5%), and in 2005 60%).

The mean age of all individuals who attempted suicide was 43.5 (SD=16.18). The youngest person who attempted suicide was 16, while the oldest was 85 years old. The mean age of men who attempted suicide was 44.6 (SD=16.59), while the mean age of women was somewhat lower - 42.5 years (SD=15.81). No statistically significant differences in mean age between men and women (t-test, p=0.283) were found.

Most people who attempted suicide were aged between 25 and 34 (23.8%), while the lowest incidence of suicide attempts was found in the age group between 55 and 64 (11.2%) years. Observed by age groups, no statistically significant differences in the frequency of suicide attempts between men and women ($\chi^2=5.537; df=5; p=0.354$) were found. In men, the highest incidence of suicide attempts was between ages of 25 and 34 (25.6%), while in women the highest incidence of attempts was found in the age group between 45 and 54 (24.2%) years (Graph 3).

With regard to the place of residence, the majority of people who attempted suicide come from urban areas (66.4%), while one in three persons comes from a rural setting (33.6%). There were no statistically significant differences in the frequency of suicide attempts between male and female patients by place of residence ($\chi^2=2.547; df=1; p=0.141$) (Graph 4).

In the analyzed period, suicide attempts most frequently occurred on Fridays (18.9%), and least frequently on Sundays (8.0%).

When observed by months, the highest number of suicide attempts occurred in July (10.8%) and August (10.5%). The months with the lowest frequency of suicide attempts were December (5.9%) and January (6.6%).

The reference period (2001–2010) was characterized by the fact that most suicide attempts took place in summer (31.5%) and spring (26.6%), followed by winter (22.0%), autumn being the season with the lowest number of suicide attempts (19.9%).

There were no statistically significant differences between men and women in the time-related features of suicide attempts: weekdays ($\chi^2=6.373; df=6; p=0.383$), sea-
Graph 1. General rates of suicide attempts in the City of Kragujevac, 2001–2010

Graph 2. Structure of suicide attempts by gender and years of observation

Graph 3. Structure of suicide attempts by gender and age groups
son (χ²=6.139; df=3; p=0.105), months (χ²=13.005; df=11; p=0.293) and years of observation (χ²=11.100; df=9; p=0.290).

In the sample observed, the majority of people who attempted suicide had a mental illness (61.5%), followed by substance dependence (13.3%), while in 3.8% of individuals mental illness and substance dependence appeared together. The highest percentage of those diagnosed with mental illness had some kind of mood disorder (F30-F39) (42.3%), followed by schizophrenia, schizotypal and delusional disorders (F20-F29) (19.2%). There were no statistically significant differences between men and women in the previous morbidity structure (χ²=11.679; df=9; p=0.232), mood disorders being the most common in both genders (35.3% and 48.4%, respectively).

The most common method of attempting suicide was poisoning (57.7%), followed by hanging (6.6%). When observed by gender, a statistically significant difference was found in the method of attempting suicide (χ²=21.847; df=6; p=0.002), with drug poisoning being far more common in women than in men (69.3% and 44.4%); on the other hand, a higher rate of suicide attempts by hanging was found in men (9.8% and 3.9%).

**DISCUSSION**

The total number of 286 individuals who were hospitalized at the Psychiatric Clinic of the Clinical Centre Kragujevac does not truly reflect the situation for a number of reasons. Above all, reasons for admitting a patient to hospital in these situations are not clearly defined in the applicable doctrine. The psychiatrist makes an assessment of vital risks, mental functioning and socio-adaptive mechanisms of the individual and his/her environment, and decides on the type and length of treatment accordingly. Many of these patients are cared for by physicians of other specialties (ER, internal medicine), and only the most severe/delicate patients are hospitalized. In such cases, the psychiatrist gets involved in team work with the patient later in the process. Sometimes the family conceals or covers up a suicide attempt, thereby intentionally bypassing psychiatric service in an attempt to avoid social stigma and rejection of their environment [21].

Distribution of suicide attempts per year showed an increase, except for the last three years, where a declining trend in the number of hospitalizations after suicide attempts was evident. The increase in the number of suicide attempts can be explained as a reaction to the accumulated stress over the years (long-term social disintegration, job loss, existential difficulties, unstable political situation) [21], while the decreasing tendency of admissions to the Psychiatric Clinic begins with the introduction of a doctrinal attitude on admission in the Clinical Centre Kragujevac, especially of intoxicated patients. Namely, patients are initially examined/observed at the Emergency Room, and the decision on further treatment is made upon consultative examination by the psychiatrist.

Our study data which point to the increasing number of women in the group of suicide attempters is consistent with the findings in the literature that indicate the typical difference between sexes; there is a significantly higher prevalence of women in the suicide attempt group [4, 10]. Women are more likely to resort to less lethal means in an attempt to take their own life, usually by taking excessive doses of medications [21].

The highest incidence of serious suicide attempts is found in women aged between 26 and 35, followed by the age group between 15 and 25 years [10]. Our findings also indicate that the majority of people who have attempted suicide are aged between 25 and 34. This can be partly explained by changes in the broader context which significantly affected the life of the population. Economic hardship, unemployment, lack of work and creative ways to overcome the difficult situation have all contributed to an increase in the number of suicide attempts in young and
middle-aged people. Helplessness in dealing with everyday life contributed to personal failure at the time when, according to age, reaching the peak of one's potential could be expected [21].

Analysis of suicide attempts in the observed period brings to attention that the majority of subjects of both sexes come from urban areas. Explanation may be found in the fact that intensive migration from rural to urban areas has taken place in our country [22]. Life in urban environment that exposes its residents to different and obviously greater stressors than the rural one can be associated with increased suicidal risk in women and reduced risk in men [21].

Upon analysis of diseases/conditions that preceded suicide in the observed period, the findings showed that as much as ¾ of the attempters had an underlying condition (mental disorder, substance dependence, or mental disorder and substance dependence combined). Mental disorders were found in more than half of the cases, diagnosis of depression being the most prevalent [17]. These findings are similar to previously published results. They suggest that most patients develop a mental disorder prior to attempting suicide, a well-known fact being that most often patients see a doctor immediately before attempting suicide; however, their condition goes unrecognized by the general practitioner due to the lack of time, but also the lack of experience in dealing with this category of patients [23].

Depression is the most common mental disorder in patients who attempt or commit suicide [24, 25]. More than 60% of all suicide attempters have some kind of depression, and when people with diagnosis of alcoholism with or without depression are included, the rate exceeds 75% [10]. This supports the doctrine that suggests all depressed patients and patients in the substance dependence group should be recognized early and initiated with serious and timely treatment. Otherwise, any delay in treatment may increase the probability of a suicide attempt.

During the ten-year period observed in our study, there were 19.2% of people diagnosed with schizophrenia, schizotypal and delusional disorders (F20-F29). Schizophrenia is a disorder burdened with a high risk of suicidal behaviour. The risk of suicide for patients with schizophrenia is 20% higher than in general population. Some studies indicate that 40% of schizophrenic patients have suicidal thoughts, 20-49% has made a failed suicide attempt, and 9-13% actually commits suicide [24].

Substance abuse increases the risk of suicide significantly. Findings in subjects in Slovenia revealed significant differences in suicidal behaviour between substance abusing subjects and non-substance abusing subjects. In addition, there were more suicidal patients in the substance-abusing group [25], consistent with the findings in our study where 13.3% patients had a history of substance abuse.

In this region, the most common method of suicide attempt is drug poisoning, while most commonly used drugs are those in the benzodiazepines group. Data provided by the National Centre for Toxicology at the Military Medical Academy support this claim, with psychotropic drugs, particularly the benzodiazepines, are the most frequently used for drug poisoning, since they are readily available and can be easily procured [26]. In the literature, drug poisoning is reported as the most common method of suicide attempt, particularly in women [10, 12, 17, 18]. Poisoning is in most cases the first suicide attempt, and most frequently results in non-lethal outcome. Thus, special attention should be paid to patients who resort to poisoning, with timely psychological assessment of risk factors that lead to the suicide attempt, followed by psychological support and appropriate treatment [12, 27], given that Owens et al. [12] showed that 12.2% self-intoxicated patients repeat the attempt using higher doses of medications.

The seasonal factors in the observed period showed the highest incidence of suicide attempts taking place on Fridays and in July. The season with most suicidal attempts was summer. Numerous epidemiological analyses of suicide found the link between suicidal behaviour and seasonal variations. Seasonal influence is clearly visible, peaking during spring and summer in comparison to other seasons. Also, higher seasonal influence has been shown in women than in men. Knowledge of the influence that seasonal variations exert on the occurrence of suicide attempts is very important, allowing for appropriate preventive measures to be taken, especially in disadvantaged areas during the periods of increased risk [18].

All these issues highlight the importance of early detection and identification of changes and disorders associated with suicide attempts, so that early diagnosis of suicide predictors and timely response could be possible. It is believed that 40-60% of patients, prior to attempting or committing suicide, visit general practitioner or Emergency Room within a week of the actual attempt [28]. Suicidal ideations in such individuals are 12 times as likely to be identified in the ER as in patients with no prior history of suicidal attempts [29]. This is an encouraging fact, as it presents an opportunity to intervene and prevent a new suicide attempt using timely identification of patients at high risk. But at the same time it is a worrying fact, too, because it reveals that doctors of various specialties lack commitment to this problem, either due to the lack of time, insufficient dedication to the patient, or inexperience in the field. There are attempts around the world to create uniform guidelines for the assessment of patients who attempted suicide or have suicidal thoughts, but for the time being no uniform guidelines have been made, only a large number of protocols, none of them being ideal [11].

**CONCLUSION**

In the past three years there has been a declining trend in hospitalizations after attempted suicide at the Clinical Centre Kragujevac, which includes the increased number of young people, and depressive disorders as the most common mental illnesses in these patients. Our study represents an original scientific contribution to the epidemiology and prevention of suicide attempts. A relatively small number of studies of this kind have been conducted in our region, thus the data obtained can be used both to plan...
new studies and develop prevention strategies, primarily as means of early detection of disorders that precede a suicide attempt. General practitioners play a key role in identifying presuicidal syndrome in their patients and need to be constantly trained for early recognition of depression symptoms, in accordance with the global measures of primary suicide prevention. Emergency Room, the first point of triaging patients and taking their medical history, is another significant link where caution should be employed with high-risk patients. The perceived limitations of the study are inclusion of a relatively small number of variables in the analysis, primarily the lack of data on important life events that may precede suicide attempts, as well as unsystematic recording of data in the medical history. Future research should include all patients admitted to the Clinical Centre Kragujevac following intoxication, with an increase in the number of observed variables and use of psychological testing to identify suicidal behaviour.

REFERENCES

Епидемиолошке одлике особа склоних самоубиству лечених у Психијатријској клиници у Крагујевцу − десетогодишња ретроспективна студија

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КРАТАК САДРЖАЈ
Увод Покушај самоубиства је значајан јавноздравствени проблем повезан с високим морбидитетом и коришћењем ресурса здравствене заштите.
Циљ рада Циљ рада је била анализи епидемиолошких одлика покушаја самоубиства у периоду 2001–2010. године за особе које су након покушаја самоубиства болнички лечени у Психијатријској клиници Клиничког центра у Крагујевцу.
Методе рада Анализирано је 286 клинички евидентираних пацијената после покушаја самоубиства (133 мужарац и 153 жене). У студији су коришћени подаци из историја болести пацијената лечених у Психијатријској клиници у Крагујевцу. Анализирана су социодемографска обележја узорка и одлике самоубилицког акта.
Резултати Утврђено је да су током посматраног периода жене чешће покушале да почине самоубиство, осим 2003, 2004. и 2005. године, када је 58,3%, 62,5%, односно 60% мужарац покушало да се убије. Највећи број особа које су покушале самоубиство било је старо између 25 и 34 године (23,8%). Већи је проценат особа које живе у градској средини (66,4%). Депресивни поремећај најчешће претходи покушају самоубиства (42,3%). Највише покушаја самоубиства је учинено узимањем превелике дозе лекова (57,7%).
Закључак У последње три године бељежи се тренд смањења броја хоспitalизација после покушаја самоубиства. За лажено је и да више младих људи покушава да се убије. Депресивни поремећај се најчешће открива код ових особа. Ради превенције покушаја самоубиства, неопходно је унапредити mere раног препознања депресивних поремећаја и почетног лечења.
Кључне речи: покушај самоубиства; демографске одлике; коморбидитет; ретроспективна анализа.