Analysis of Suicide Attempted Patients Admitted to an Emergency Medical Center

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Abstract

Objective: This research was conducted to review whether there was a difference in the method of attempted suicide in patients admitted to the emergency medical center at S region, from January 2014 to December 2014. Methods: We reviewed retrospectively the medical records by using 162 cases of attempted suicide patients in the emergency medical center. An analysis of medical treatment result based on gender and age characteristics, season of suicide occurrence, suicide attempt method, and treatment result based on suicide attempt, was conducted by investigating general characteristics, season of suicide occurrence, emergency medical care, and suicide attempt methods. Findings: As per the result of the analysis, suicide by consuming sleeping pills was the most common among the suicide attempt methods. Hospital transfer due to consumption of sleeping pills and mortality rate due to pesticide poisoning were the highest. There was no difference across the time of arrival at the hospital, the season or the day of the week. In conclusion, emotional support from family members is desperately required to prevent suicides via hanging that have the highest effect on death and to better prevent the usage of medications meant to be used as sleeping aids as an aid to suicide. Improvements: Therefore, based on the results of this research, we intend to develop a suicide prevention program suitable for age group, and provide basic information necessary for establishing a national health project plan that reduces public health expenses.

Keywords: Emergency Medical Center, Mortality Rate, Pesticide, Sleeping Pills, Suicide Methods

1. Introduction

The World Health Organization (WHO) defines three types of health. One of those type is social health, and representative indication was suicide rate. Suicide rate in Korea was shown as ranked No. 1 among OECD member countries for 10 consecutive years. According to data from National Statistical Office (NSO) released in September 2014, for cause of death in 2013, suicide was ranked fourth with 5.4% after malignant neoplasm (cancer) 28.3%, cerebrovascular disease 9.6%, and cardiac disorder 9.5% in sequence. Suicide is occurring due to not only psychological and physical conditions, but also political, social, economical and cultural elements. Thus, cause for suicide is suggested differently depending on academic perspectives. Furthermore, suicide is more about entire age group, rather than certain age group. It is difficult to assume number of suicide attempt cases, as there is no accurate data about suicide death rate due to suicide attempt at this point in Korea. Therefore it is necessary to investigate risk elements of suicide attempts and the protection elements, and diversified approaches relate to social safety net building for suicide prevention are needed as well. So method to analyze related study result and connect to prevention program development should be considered1. Addiction was accounted for highest rate as suicide method. Despite advanced emergency medical system and emergency medicine, this distinctive phenomenon, the fact that addition is still indicating the highest rate among death by suicide, appears only in Korea2. Accordingly, in this research, analysis was conducted on the features of suicide attempted patient who visited local emergency medical center. And based on this analysis, and by suggesting basic data necessary for estab-

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lishing suicide prevention program and suicide related policies, we intend to use as basic data for national health project that could reduce public health expense.

2. Research Methods
This research was conducted with total 162 suicide attempt patients who visited emergency medical center in S region, from January to December 2014. Analysis on medical treatment result based Analysis based on National Emergency Department Information System (NEDIS) and medical records, was conducted using retrospective review through investigation to gender, feature by age, occurred season, emergency medical treatment result, suicide attempt method and others. In addition, relations among treatment results and suicide attempt methods resulted due to occurred season for features by gender and age were analyzed using SPSS win 22.0 program.

3. Results
3.1 General Characteristics of Target Patients
Total number of patients who visited emergency medical center during investigation period was 32,767. Number of suicide attempt patients who visited emergency medical center during investigation period was total 162, and accounted for 0.49% of entire patients who visited emergency medical care center. Among total 162 suicide attempt patients, male patients showed majority with 86 male patients (53.1%), and 76 female patients (46.9%). For distribution by age, 30’s indicated the highest as 25.9%, followed by 50’s 14.8%, and 40’s 14.8% in sequence. For male patients, 30’s and 50’s were among the highest as 22.1% and for female patients, 30’s as 30.3% (Table 1).

3.3 Feature by Treatment Result
From treatment result, home returning was the highest as 43.2%, hospital transfer 30.2% and death 21.0% in sequence, and with statistically significant difference (p<0.029) (Table 3).

3.2 Feature by Season
For suicide occurred season, spring was shown as the highest rate as 38.9%, and winter was the lowest rate as 13.0%. For male patients, summer was the highest rate as 21.0% and for female patients, spring as 20.0% (Table 2).

3.4 Characteristics between Suicide Methods by Gender
For suicide methods by gender, pesticide was the highest as 30.2% for male, and hanging 19.8%, self-harm 17.4% in sequence. For female, sleeping pills was the highest as 34.9%, and pesticide 18.4%, self-harm 17.1% in sequence. From the result, suicidal method by gender was shown to have significant difference (p<0.001) (Table 4).

3.5 Characteristics among Suicide Attempt Methods by Age
For suicide attempt method by age, sleeping pills showed the highest rate as 50.0% for teenagers. In case of 20's,
self-harm was the highest rate as 50.0%, and sleeping pills 33.3% for 30’s and 40’s age group. For teenagers, 30’s and 40’s, sleeping pills was the highest rate, while self-harm showing 50.0% for 20’s. For over 40’s, pesticide was shown high rate in comparison, and with significant difference in the analysis result (p<0.010) (Table 5).

3.6 Characteristics among Suicide Attempt Methods by Season
For suicide attempt methods by season, spring showed the highest as 28.6% followed by sleeping pills 25.4%, and pesticide 17.5% in sequence. Pesticide was the highest rate as 38.3% in the summer followed by sleeping pills 27.7%, hanging 14.9% in sequence. Sleeping pills was the highest as 29.0% in fall season, followed by pesticide 25.8%, hanging 16.1% in sequence. Briquet and sleeping pills were the highest as 23.8% in the winter, followed by hanging 19.0%, pesticide 14.3% in sequence. There was no significant difference among suicide attempt methods by season (Table 6).

3.7 Characteristics among Suicide Attempt Methods based on Treatment result
In suicide attempt methods based on treatment result, sleeping pill was the highest rate as 32.9% and 55.0% for home returning and hospitalization. Pesticide showed

Table 4. Characteristics between suicide methods by gender

| Gender | Pesticide | Hanging | Briquet | Self-harm | Sleeping pills | Detergent | Alter ego | Fall | p-value* |
|--------|-----------|---------|---------|-----------|----------------|-----------|-----------|------|---------|
| Male   | 26(30.2)  | 17(19.8)| 13(15.1)| 15(17.4)  | 8(9.3)         | 2(2.3)    | 3(3.5)    | 2(2.3)| 0.000   |
| Female | 14(18.4)  | 9(11.8) | 3(3.9)  | 13(17.1)  | 35(46.1)       | 2(2.6)    | 0(0.0)    | 0(0.0)|         |
| Total  | 40(24.7)  | 26(16.0)| 16(9.9) | 28(17.3)  | 43(26.5)       | 4(2.5)    | 3(1.9)    | 2(1.2)|         |

* by ch-square test and fisher’exact test at =0.05

Table 5. Characteristics among suicide attempt methods by age

| Age     | Pesticide | Hanging | Briquet | Self-harm | Sleeping pills | Detergent | Alter ego | Fall | p-value* |
|---------|-----------|---------|---------|-----------|----------------|-----------|-----------|------|---------|
| 10-19yrs| 0(0.0)    | 1(16.7) | 0(0.0)  | 2(33.3)   | 3(50.0)        | 0(0.0)    | 0(0.0)    | 0(0.0)| 0.010   |
| 20-29yrs| 1(8.3)    | 1(8.3)  | 1(8.3)  | 6(50.0)   | 2(16.7)        | 1(8.3)    | 0(0.0)    | 0(0.0)|         |
| 30-39yrs| 2(4.8)    | 7(16.7) | 8(19.0) | 9(21.4)   | 14(33.3)       | 0(0.0)    | 0(0.0)    | 2(4.8)|         |
| 40-49yrs| 5(20.8)   | 2(8.3)  | 4(16.7) | 4(16.7)   | 8(33.3)        | 0(0.0)    | 1(4.2)    | 0(0.0)|         |
| 50-59yrs| 11(34.4)  | 4(12.5) | 2(6.3)  | 4(12.5)   | 7(21.9)        | 3(9.4)    | 1(3.1)    | 0(0.0)|         |
| 60-69yrs| 8(44.4)   | 2(11.1) | 1(5.6)  | 2(11.1)   | 5(27.8)        | 0(0.0)    | 0(0.0)    | 0(0.0)|         |
| 70-79yrs| 8(53.3)   | 5(33.3) | 0(0.0)  | 1(6.7)    | 1(6.7)         | 0(0.0)    | 0(0.0)    | 0(0.0)|         |
| 80yrs more| 5(38.5) | 4(30.8) | 0(0.0)  | 0(0.0)    | 3(23.1)        | 0(0.0)    | 1(7.7)    | 0(0.0)|         |
| Total   | 40(24.7)  | 26(16.0)| 16(9.9) | 28(17.3)  | 43(26.5)       | 4(2.5)    | 3(1.9)    | 2(1.2)|         |

* by ch-square test and fisher’exact test at =0.05

Table 6. Characteristics among suicide attempt methods by season

| Season  | Pesticide | Hanging | Briquet | Self-harm | Sleeping pills | Detergent | Alter ego | Fall | p-value* |
|---------|-----------|---------|---------|-----------|----------------|-----------|-----------|------|---------|
| Spring  | 11(17.5)  | 10(15.9)| 6(9.5)  | 18(28.6)  | 16(25.4)       | 0(0.0)    | 1(1.6)    | 1(1.6)| 0.146   |
| Summer  | 18(38.3)  | 7(14.9) | 2(4.3)  | 4(8.5)    | 13(27.7)       | 2(4.3)    | 1(2.1)    | 0(0.0)|         |
| Autumn  | 8(25.8)   | 5(16.1) | 3(9.7)  | 3(9.7)    | 9(29.0)        | 2(6.5)    | 0(0.0)    | 1(3.2)|         |
| Winter  | 3(14.3)   | 4(19.0) | 5(23.8) | 3(14.3)   | 5(23.8)        | 0(0.0)    | 1(48.)    | 0(0.0)|         |
| Total   | 40(24.7)  | 26(16.0)| 16(9.9) | 28(17.3)  | 43(26.5)       | 4(2.5)    | 3(1.9)    | 2(1.2)|         |

* by ch-square test and fisher’exact test at =0.05
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42.9% and sleeping 30.6% respectively for hospital transfer. For death, hanging was the highest rate as 64.7% while sleeping pills indicated 0%, and with significant difference among suicide attempt methods based on treatment result (p<0.001) (Table 7).

4. Discussion

Suicide method is shown to change in different forms based on country and time frame. For Korea prohibiting gun ownership unlike U.S. and Australia, was not indicated in the separate chart or table. However, suicide frequency by guns and firearms in 2011 showed only 0.1%. Frequently used suicide method at the beginning stage based on Denmark suicide statistics, was hanging, and gradually changed to gas addiction, and poisoning by solvent or drugs. These days, extreme methods such as hanging or drowning are reported to be used in suicides¹. According to this research, suicide attempt patients among people who visited emergency medical care center for one year with 0.49% showed statistical significance to 0.5% of ¹ and 0.66% of ². During investigation period, total number of patients visited emergency medical care center was 32,767, and suicide attempt patients who visited emergency medical care center in this period was 162 people which accounted for 0.49% of entire outpatients to emergency medical care center. This shows statistical significance to 0.50% of ³. For gender comparison, male showed higher rate, and male-female gender ratio was shown as 1.13:1 overall. ⁴ showed higher female ratio for gender ratio, but mainly for drugs such as sleeping pills. For male, it is mainly comprised of agricultural pesticides such as pesticide and herbicide. However, it conflicts with the report of female majority with 1:1.3-3.1 based on epidemiologic survey for suicide attempt patients of ⁷. Looking at death rate of suicide attempt patients, with rates shown as male 29.1%, and female 11.8%, male suicide success rate was higher. This is consistent with research⁵. In age comparison, 30's was the highest for both male and female, with 22.1%, 30.3% respectively. And it is consistent with research⁶. For under 50's, it was in the order of confictions in family and friend matters, psychological problems, and economical issues, and for ages from 60 to 69, health problems, psychological problems, confictions in family and friend matters in sequence. For over 70's, health problems was main reason for suicide attempt⁶. And for seasonal suicide, spring was the highest rate as 38.9% followed by summer as 29.0%, and winter was indicated as the lowest with 13.0%⁸. And this is consistent with the report that both male and female show high suicide attempt rate in spring and summer seasons with a lot of sunshine, by research⁹ that investigated relation between sunshine amount and suicide rate. In addition, another reason for frequent acute poisoning occurrence in spring and summer, is because in countries, convenient method in the corresponding region are selected as suicide method¹⁰. As regional characteristics, agricultural pesticides can be obtained easily in farming season, spring and summer. Sleeping pill was the highest as 26.5% for suicide attempt method, followed by agricultural pesticides 24.7%, self-harm 17.3%, and hanging 16.0%. Suicide attempt using agricultural pesticides was the highest as 30.2% for man, and sleeping pills accounted for 46.1% for female. The reason that medicine and medical supplies shows higher ratio than that of agricultural pesticides, is that drugs can be easily obtained due to regional convenience. Thus, necessity for careful management of medicine supplies should be emphasized. For acute poisoning prevention, proactive drug side effects advertising and education are required, rather than passive approaches in the past, such as educating how to spray agricultural chemicals and the usage. In addition, groups with possible drug poisoning should be under more effec-

Table 7. Characteristics among suicide attempt methods based on treatment result

| Treatment result | Pesticide | Hanging | Briquet | Self-harm | Sleeping pills | Detergent | Alter ego | Fall | p-value* |
|------------------|-----------|---------|---------|-----------|----------------|-----------|-----------|------|----------|
| Homecoming       | 12(7.1)   | 2(2.9)  | 8(11.4) | 22(31.4)  | 23(32.9)       | 3(4.3)   | 0(0.0)   | 0(0.0)| 0.000    |
| Admission        | 3(33.3)   | 0(0.0)  | 0(0.0)  | 1(11.1)   | 5(55.6)        | 0(0.0)   | 0(0.0)   | 0(0.0)|          |
| Transfer         | 21(42.9)  | 2(4.1)  | 3(6.1)  | 4(8.2)    | 15(30.6)       | 1(2.0)   | 2(4.1)   | 1(2.0)|          |
| Death            | 4(11.8)   | 22(64.7)| 5(14.7) | 1(2.9)    | 0(0.0)         | 0(0.0)   | 1(2.9)   | 1(2.9)|          |
| Total            | 40(24.7)  | 26(16.0)| 16(9.9) | 28(17.3)  | 43(26.5)       | 4(2.5)   | 3(1.9)   | 2(1.2)|          |

* by ch-square test and fisher’exact test at =0.05
tive management. In case of purchasing drugs for suicide purpose in distribution, specific measures are necessary to block off such purchase. From treatment result, home returning was the highest as 43.2%, followed by hospital transfer 30.2%, death 21.0% in sequence. For result of 4, home returning 75.0%, hospitalization 20.4%, hospital transfer 5.3%, death 1.4% in sequence, and it showed significant difference in ratio aspect in comparison with this research. It is considered due to regional difference in the emergency medical care that located in city, and urban & rural complex area. For characteristics among suicide attempt methods by gender, age, there was clear distinction in gender. Agricultural pesticide for male and sleeping pill for female showed the highest as 30.2%, and 46.1% respectively. Male showed higher suicide success rate in carrying out suicide using fatal methods. On the other hand, females tend to choose less extreme methods, and ended up suicidal attempt in most occasions. It did not show significant difference among suicide attempt methods by age. For season and characteristics, there was no significant difference among suicide attempt methods by season and hospital visiting time. From suicide attempt methods based on treatment result, for home returning and hospitalization, sleeping pills showed the highest as 32.9%, agricultural pesticides the highest as 42.9% for hospital transfer, and hanging the highest as 64.7% for death. However, as shown in the result from 13, death was not reported for sleeping pills taken by patients with highest ratio. According to national statistics portal (http://kosis.kr) of National Statistical Office, death occupancy rate by hanging was the highest as 52.4% in 2011 Korea, followed by addiction (27.6%), fall (14.6%) in sequence, and it is consistent with the result of this research.

5. Conclusions

As result of this research, analysis on general characteristics and suicide attempt methods is concluded as follows:

First, suicide occurrence distribution was shown high in 30’s and 50’s for male and in 30’s for female. For seasonal suicide, summer was high for male, and spring was high for female. From treatment result, home returning was the highest rate, followed by hospital transfer, death in sequence.

Second, for suicide attempt methods, agricultural pesticide was the highest for male, followed by hanging, self-harm in sequence. And for female, it was sleeping pills, agricultural pesticides, self-harm in sequence, and showed significant difference in suicide attempt methods by gender.

Third, for suicide attempt methods by age, sleeping pill was the highest for teenagers, self-harm for 20’s, sleeping pills for 30’s and 40’s, and agricultural pesticides the highest for after 40’s. And it was shown to have significant difference.

Fourth, for suicide attempt by season, self-harm was the highest followed by sleeping pills, agricultural pesticides in sequence. For home returning, agricultural pesticide was shown as higher rate than that of sleeping pill. Hanging was the highest rate for death, and sleeping pills showed nothing. And it was shown to have significant difference in suicide attempt methods.

Fifth, from treatment result, sleeping pill was the highest for home returning, followed by self-harm, agricultural pesticides in sequence. For home returning, agricultural pesticide was shown as higher rate than that of sleeping pill. Hanging was the highest rate for death, and sleeping pills showed nothing. And it was shown to have significant difference in suicide attempt methods.

Based on such result, it is considered that supervision to sale of sleeping pills, medicine and medical supplies, agricultural pesticides used for suicide purpose, are required along with strong systematic support in government level. Furthermore, in order to reduce home returning rate and death rate of suicide attempt patients, suicide prevention program by age needs to be developed and promoted.

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