

# A Characteristics Analysis of Pre-hospital Acute Poisoning in The Elderly

Il-Soon Choi\*, Seon-Rye Kim\*\*, Byung-Jun Cho\*\*\*

## Abstract

This study selected all patients with acute poisoning carried by the 119 emergency services in K-Province from January 1 to December 31, 2015 for complete enumeration. The subjects were 1,627 patients who were classified as poisoning suspected in chemicals and animal/insect poisoning by Rescue Emergency Activity Information System(Emergency Statistics) in fire-fighting portal system of K-province fire-fighting officers. The 119 activity journals were analyzed retrospectively. The major results are as follows. Regarding the demographic characteristics of the elderly and the non-elderly, the most people were unemployed in the elderly group, other job, the non elderly group about their occupations and in both groups, the most people lived in rural areas about their living places. Regarding the poisoning characteristics of the elderly and the non-elderly, the most causing substance was bee sting about the poisoning causing substances and most of patients didn't get drunken about drunken state in both group. Regarding the time factors of the elderly and the non-elderly, both groups had the most accidents in afternoon about the poisoning time and in summer about the seasonal distribution.

▶ Keyword: Acute Poisoning, The Elderly, Prehospital, 119 Resque, Urban area

## I. Introduction

The World Health Organization (WHO) has 193,000 people experiencing unintentional addictions in 2012 [1]. In Korea, the death rate due to unintentional poisoning as of December 2017 is 0.6 per 100,000 population, which is lower than the average of 1.5, but it is not small [2]. As of December 2017, only 46% of the WHO member states have established and operate an addiction center, thus claiming to establish more addiction centers [3].

K is also seen as a serious social problem in the region, increasing by 6.73% in 2011, 7.6% in 2013 and 8.61% in 2015, according to the statistics of addicted patients transferred by paramedics [4].

Drug addiction has a wide variety of clinical signs and

symptoms depending on the type of drug, and it is required not only the initial emergency treatment according to the substance, but also the drug should be removed at the earliest time before the ingested drug is absorbed into the body. Is very important for patient recovery [5]. In the case of an addiction accident, the cost of the examination is high, the examination time is relatively long, and the high hospitalization rate and mortality rate are the reality [6]. Serious aftereffects and complications can also cause many problems in the home, the community, and the country as a whole.

In particular, as of November 1, 2015, Kdo, an elderly society with an elderly population of 16.9%, appears to be

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a very important social problem in the elderly. The prevalence of the elderly is generally high in hypertension, diabetes, stroke, and cerebrovascular disease, and more than half of the elderly have a combination of two or more chronic diseases[7]. Therefore, it is necessary to analyze the addiction accidents of the elderly and non elderly groups based on these statistics.

On the other hand, according to the second 119 rescue and rescue basic plan of the National Security Agency, emphasis is on the arrival time of the paramedics, the necessity of emergency treatment, the demand for medical guidance, the quality of on-site first aid and the provision of customer- And an increase in the number of addiction accidents [8].

Though 35 years have passed since the 119 rescue team first started work in Seoul in 1982, it has not received a positive evaluation as a knowledge research expert on drug addiction accidents in the field of poisoning by paramedics[9, 10, 11]. In order to provide efficient emergency response to paramedics, paramedics should be familiar with the medication, poisoning time, and early patient assessment and treatment of the poisoned drug in the case of acute poisoning. You also need to know what type of addiction is happening frequently in your area. In the case of poisoning transfer case analysis, it is applied to job training of 119 paramedics related to addiction, amendment manual of paramedics field work, development of first aid campaign for the people, and development of first aid instruction manual for pre-hospital poisoning patients. And provide the basis for ensuring the stability of homes, communities and the nation as a whole.

Therefore, this study analyzed the transfer of 119 rescue units, which is one ring of domestic emergency medical system, and confirmed the local poisoning safety management of the elderly and the acute poisoning patients.

## II. Methods

### 1. Subjects

The subjects of the survey were selected from the survey of 119 acute care intoxications transferred from January 1, 2015 to December 31, The subjects were

1,649 subjects but excluded 22 persons with insufficient records. 1,627 patients were analyzed.

### 2. Methods

K-do Firefighting officers Attempted 119 rescue logbooks for those who are classified as chemical substances, animals / insects, and poisoned substances, which are classified as suspected poisoning items in the rescue emergency activity information system (emergency statistics) Respectively. Subjects with unclear smoke inhalation and asphyxia were excluded from the study.

The content of the survey is as follows. Sex, age, occupation, history of depression, type of addictive substance, cause of poisoning, conscious state during transport, whether or not alcohol is drunk when arriving at paramedics, medical guidance, date and time of arrival, and arrival time.

### 3. Data Analysis

The collected data were analyzed using SPSSWIN (version 20.0) statistical program. The significance level of all statistics was  $p < 0.05$ . The frequency of the subjects' demographic characteristics, addiction-related characteristics, and time-related characteristics were analyzed, and the relationship between the variables according to each characteristic was analyzed by the  $\chi^2$  test.

### 4. Ethical Consideration

The study was approved by the head of the agency. The survey was conducted after the purpose of the study and the contents of the research were explained to the person in charge of the relevant institution and the consent was obtained to view the data.

## III. Results

### 1. Demographic Characteristics

There were statistically significant differences in occupational and residential areas, but there was no significant difference in sex distribution or history of depression (Table 1).

There were 746 men (63.8%), 423 women (36.2%), 272 men (59.4%) and 186 women (40.6%) in the non elderly group, but there was a significant difference I did. The

results of the occupation showed that the occupation of the elderly group was 231 persons in the elderly, followed by the others (443 persons, 37.5%), 325 unemployed persons (27.8%), 251 office workers (21.5% 50.4%), other occupations 96 (21.0%), agriculture 122 (26.6%), and office workers 9 (2.0%). In residence area, 609 residents (52.1%) residing in rural areas, 560 residents (47.9%) residing in urban areas, 334 residents (72.9%) residing in rural areas and 124 residents (27.1% (P = 0.000), respectively. Depression was found in 1152 patients (98.5%) in the non elderly group and 452 (98.7%) in the elderly group, but there was no significant difference.

Table 1. Demographic characteristics of the elderly and non-elderly

Variables		Under old age		Old age		p-value
		(<65years)		(>=65years)		
		N	%	N	%	
Gender	Male	746	(63.8)	272	(59.4)	0.109
	Female	423	(36.2)	186	(40.6)	
Occupations	Unemployment	325	(27.8)	231	(50.4)	0.000
	agriculture	150	(12.8)	122	(26.6)	
	Office worker	251	(21.5)	9	(2.0)	
	Others	443	(37.9)	96	(21.0)	
Dwelling place	Urban dwelling	560	(47.9)	124	(27.1)	0.000
	Rural dwelling	609	(52.1)	334	(72.9)	
Depression history	No	1,152	(98.5)	452	(98.7)	1.000
	Yes	17	(1.5)	6	(1.3)	
Total		1,169	(71.9)	458	(28.1)	

## 2. Acute Poisoning Characteristics

There were statistically significant differences in addictive substance and alcohol status, but there was no significant difference in medical guidance, addiction motivation, and consciousness (Table 2).

In the non elderly, bee bite 672 cases (57.5%), medicines 164 cases (14.0%), pesticides 68 cases (5.8%), snake doctors 62 cases (5.3%) and carbon monoxide poisoning 60 cases. In the elderly group, bee bite 263 cases (57.4%), pesticide 60 cases (13.1%), medicines 45 cases (9.8%) and snake patients 24 cases (5.2%) showed significant difference (p = 0.000). There were 997 cases (85.3%) of accidents in the non elderly group and 384

cases (83.8%) in the elderly group, but there was no significant difference. The level of consciousness of the patients was in the order of 1,022 (87.4%), 82 (7.0%) responding to language and 46 (3.9%) responding to pain stimuli in the non elderly group. In the elderly group, 389 (84.9%) were clear, 31 (6.8%) responded to language, and 26 (5.7%) responded to pain stimuli. There was no statistically significant difference. In the non elderly group, 1,099 (94.0%) were non - alcoholic and 443 (96.7%) were non - alcoholic in the elderly group. The difference was statistically significant (p = 0.027). 956 (81.8%) of the non elderly were transferred without medical guidance, and 377 (82.3%) were elderly.

Table 2. Poisoning characteristics of the elderly and non-elderly

Variables		Under old age		Old age		p-value
		(<65years)		(>=65years)		
		N	%	N	%	
Substance	Pharmaceuticals	164	(14.0)	45	(9.8)	0.000
	Pesticides	68	(5.8)	60	(13.1)	
	Carbon monoxide (CO)	60	(5.1)	18	(3.9)	
	Food poisoning	28	(2.4)	8	(1.7)	
	Chemicals	39	(3.3)	11	(2.4)	
	Bee sting	672	(57.5)	263	(57.4)	
	Snake biting	62	(5.3)	24	(5.2)	
	Centipede sting	29	(2.5)	17	(3.7)	
	Jellyfish sting	15	(1.3)	0	(0.0)	
Others	32	(2.7)	12	(2.6)		
Poisoning Reason	Suicide	172	(14.7)	74	(16.2)	0.465
	Accident	997	(85.3)	384	(83.8)	
Mental state	A (Alert)	1,022	(87.4)	389	(84.9)	0.064
	V (Verbal)	82	(7.0)	31	(6.8)	
	P (Pain)	46	(3.9)	26	(5.7)	
	U (Coma)	19	(1.6)	12	(2.6)	
Drunken state	No	1,099	(94.0)	443	(96.7)	0.027
	Yes	70	(6.0)	15	(3.3)	
Medical direction	Yes	213	(18.2)	81	(17.7)	0.801
	No	956	(81.8)	377	(82.3)	
Total		1,169	(71.9)	458	(28.1)	

## 3. Time Related Characteristics

There was a statistically significant difference in poisoning time and seasonal distribution, but there was no significant difference between monthly distribution, time from report to site arrival, and arrival time to hospital (Table 3).

Table 3. Time factors of the the elderly and non-elderly

Variables		Under old age		Old age		p-value
		(<65years)		(>=65years)		
		N	%	N	%	
Poisoning time	00:00-06:00	110	(9.4)	26	(5.7)	0.010
	06:00-12:00	334	(28.6)	157	(34.3)	
	12:00-18:00	442	(37.8)	180	(39.3)	
	18:00-24:00	283	(24.2)	95	(20.7)	
Monthly distribution	January	17	(1.5)	7	(1.5)	0.356
	February	26	(2.2)	9	(2.0)	
	March	34	(2.9)	18	(3.9)	
	April	28	(2.4)	16	(3.5)	
	May	57	(4.9)	34	(7.4)	
	June	75	(6.4)	23	(5.0)	
	July	268	(22.9)	92	(20.1)	
	August	311	(26.6)	116	(25.3)	
	September	209	(17.9)	94	(20.5)	
	October	78	(6.7)	25	(5.5)	
	November	33	(2.8)	15	(3.3)	
	December	33	(2.8)	9	(2.0)	
Seasonal distribution	Spring (March~May)	119	(10.2)	68	(14.8)	0.028
	Summer (June~August)	654	(55.9)	231	(50.4)	
	Fall (September~November)	320	(27.4)	134	(29.3)	
	Winter (December~February)	76	(6.5)	25	(5.5)	
Duration of arrival on the scene	≤10 mins	528	(45.2)	195	(42.6)	0.075
	10- ≤20 mins	455	(38.9)	180	(39.3)	
	20- ≤30 mins	116	(9.9)	65	(14.2)	
	30- ≤40 mins	37	(3.2)	9	(2.0)	
	>40 mins	33	(2.8)	9	(2.0)	
Duration of arrival at hospital	≤20 mins	632	(54.1)	228	(49.8)	0.254
	20- ≤40 mins	389	(33.3)	171	(37.3)	
	40- ≤60 mins	112	(9.6)	49	(10.7)	
	>60 mins	36	(3.1)	10	(2.2)	
Total		1,169	(71.9)	458	(28.1)	

The addiction time was in the order of 442 (37.8%) in the afternoon, 334 (28.6%) in the morning time, 283 (24.2%) in the night time and 110 (9.4%) in the early morning time. In the elderly, there were 180 (39.3%) in the afternoon, 157 (34.3%) in the morning, 95 (20.7%) in the night time and 26 (5.7%) in the early morning time. There was a statistically significant difference (p = 0.010). The monthly distribution of the non elderly was 311 (26.6%) in August, 268 (22.9%) in July, 209 in September (17.9%), 78 in October (6.7%) and 75 in June It is in order. In the elderly, 116 (25.3%) were in August, 94 (20.5%) in September, 92 (20.1%) in July, 34 (7.4%) in May, And 23 (5.0%). There was no statistically significant

difference. The seasonal distribution is 654 (55.9%) in summer, 320 (27.4%) in autumn, 119 (10.2%) in spring and 76 (6.5%) in winter in the non elderly. In the elderly, 231 (50.4%) were in the summer, 134 (29.3%) were in the autumn, 68 (14.8%) were in the spring and 25 (5.5%) in the winter. There was a statistically significant difference (p = 0.028). In the elderly group, 528 patients (45.2%) were in the 10 minutes, 455 patients (38.9%) were in the 10 minutes and 20 minutes, 116 patients (9.9% (42.6%), followed by 180 (39.3%) over 20 minutes and 65 (14.2%) within 30 minutes after 20 minutes. There was no statistically significant difference. The time required to reach the emergency medical center was 632 (54.1%) in less than 20 minutes, 389 (33.3%) in less than 40 minutes in 20 minutes, and 112 (9.6%) in less than 60 minutes in 40 minutes in the non elderly. 228 (49.8%) were less than 20 minutes, 171 (37.3%) were more than 20 minutes and less than 40 minutes, and 49 (10.7%) were less than 60 minutes in the elderly. There was a statistically significant difference

#### IV. Discussion

As of November 1, 2015, the proportion of elderly people is 16.9%, which is a very important social problem in the aged city [7]. The prevalence of the elderly is generally high, and more than half have more than one chronic disease [7]. Therefore, this study analyzed the transfer of 119 rescue squads, which is one ring of domestic emergency medical system, as follows and confirmed that the pre - hospital addiction was serious.

The subjects of this study were 1,627 patients who were selected for the study of the number of acute intoxication transferred from 119 rescuers between January 1 and December 31, 2015. Specifically, K province is a retrospective of 119 emergency activity logbooks for subjects classified as chemical substances, animals / insects, and poisoning in suspected poisoning in the rescue and rescue activity information system (emergency statistics)[4].

In this study, there were statistically significant differences between occupational and residential areas in both groups, but there was no significant difference in sex distribution or history of depression. This was different from the results of a study in which the number

of women in the non elderly and elderly groups was greater than in men [12, 13]. The comprehensive measures for the general characteristics of the elderly can be thought of as requiring the repetitive awakening through various broadcast media. This is consistent with the results of a study in which medicines (58.05%), gas (10.63%), unknown causes (18.4%), medicines (40.00%), pesticides (32.5% Respectively [12, 14].

The medicines were frequently caused by poisoning of substances that could easily be found in the vicinity due to the causes of both the elderly and the binocular. The incidence of addiction was mostly caused by accidents in both the nonelderly and the elderly, and there were no significant differences. This was different from the results of suicide attempts (58.4%), accidents (41.6%), suicide attempts (58.8%) and accidents (41.6%) in the elderly group [11, 15]. The countermeasures against this problem can be solved by conducting detailed studies on the causes of environmental addiction in each region and studying to establish effective first aid. Although it is desirable that an addiction center is established and operated, it should be easily structured so that citizens who do not have additional knowledge and expert knowledge of natural causes of poisoning of the chemical information system in the present situation can use the system until the establishment, The government should be integrated with the system in a comprehensive manner [16, 17].

In the present study, there were statistically significant differences in the time-related characteristics of poisoning time and season, but there was no significant difference between the monthly distribution, the time from report to arrival, and the time to arrival.

The comprehensive measures concerning time-related characteristics are as follows. Vital signs of elderly poisoning patients are likely to change drastically. As a countermeasure against this, it is necessary to develop education programs for the elderly poisoning accident prevention campaign, early reporting of the first responders, initial emergency treatment, and active training for emergency first aid[17, 18, 19]. which can be used in a variety of addiction situations by injecting antineoplastics such as epinephrine for specific causes of addiction, expanding the scope of the emergency rescue staff such as 12-lead electrocardiographic examination and transmission, and activating direct and indirect medical guidance.

This study limited the research subjects to K cities, so there is a limit to generalizing the results of research. However, we are confident that we provided basic data for the construction of an effective emergency medical system by analyzing the types of poisoning patients transferred by 119 paramedics in K city with characteristics as tourist attractions and rural areas.

The results of this study suggest that it is necessary to improve the coping ability of paramedics in pre - hospital addiction patients. It is important to note that there is a need for a specialist who can handle the elderly poisoning patient, a repetitive skill-centered education for the addicted situation, an improvement of first-aid quality of all first-aid workers, Doctors need to build medical guidance.

It is required to expand the scope of emergency medical service work such as the development and addition of first aid addiction first aid treatment and the 12 - lead electrocardiogram examination and transmission of addicted patient in the existing standard of first aid site guidelines. In addition, the fire department chief should establish a direct order of 119 rescue squads to secure the expertise of integrated emergency management and rescue services [20].

## V. Conclusions

This study was conducted to investigate the number of acute intoxication transferred from 119 emergency services in K city from January 1 to December 31, 2015. A total of 1,627 persons were surveyed. The number of people who were classified as chemical substances, animals / insects, and addictions, which are suspected to be poisoned, in the rescue activity information system of the firefighting integrated portal system, Respectively. The main results are summarized as follows.

Elderly people were the most unemployed, while non elderly group was the most resident in the rural areas as a result of other occupations and settlements. The most common cause of addiction in the elderly and non - alcoholic beverages was alcohol consumption, alcohol consumption, and alcohol consumption. Poisoning time was high in the afternoon hours for both the elderly and the Bino population. In the seasonal distribution, summer was the most common in the elderly group and the binocular group.

As a result of the above study, the following suggestions are made. In the case of most mountainous areas like K province, a detailed study of causes of poisoning such as animals, pests, and worms that cause poisoning and studies to establish effective first aid should be done at the same time. Most of the addictive motives are unintentional, so the national interest to prevent them and the integrated management of the government on addictive substances should be comprehensive. In addition, it is necessary to improve the first aid ability of paramedics for the pre-hospital addicts. For this, it is necessary to acquire the first-aid specialist who can handle the addicted patients and 119 medical doctors.

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