

# SUICIDE ATTEMPTS BY AGRICULTURAL CHEMICALS

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## SUMMARY

Forty three patients (42%) used agricultural chemicals as a method of suicide over nine and a half years (from Oct. 1981 to March 1991), and most cases were reported in June (agricultural activity) and December (year's end). The highest prevalence was in patients in their fifties (34.9%). 58.1% of these patients who committed suicide were farmers or had no fixed occupation. Main precipitating factor was difficulties in interpersonal relationships (30.9%), and the largest number of patients (25.6%) were diagnosed as having manic-depressive psychosis, depressed type.

## INTRODUCTION

The use of agricultural chemicals in attempting suicide has recently manifest as a problem in the field of emergency medical and psychiatric care in regions where agriculture is the primary industry in Japan. This is not only a Japanese phenomenon, but has also been observed in the United States (Reich et al, 1968), Sri Lanka (Berger, 1988), India (Venkoba Rao, 1971), Jordan (Al-Ragheb & Salhab, 1989), and Finland (Daradkeh, 1989).

The aim of this study is to describe the profile, the prognosis and the outcome of patients after a suicide attempt in a Japanese medical school hospital.

## MATERIAL AND METHOD

Out of 102 patients who attempted suicide (intentionally and not spontaneously), 43 patients used agricultural chemicals as methods. All these patients were admitted to the hospital in the nine year and six month period. The selection of those patients who attempted suicide was made by culling the lists of patients admitted in the neuro-psychiatric ward, ICU, emergency ward, renal dialysis unit, and the list of patients who requested psychiatric consultations. The form for collecting information included the type of agricultural chemicals, the period in which the suicide attempt occurred, age, occupation, the past history of physical and medical disorders, treatment received prior to suicide attempt, the precipitating factor, the diagnosis (mainly based on ICD-9), prognosis, follow-up, and whether or not there have been frequent suicide attempts.

## RESULTS

**Seasonality:** There was an increasing prevalence both in June and December. For farmers, June is the month of the rice-planting season when the peak of agricultural activity is reached. December corresponds to the busy year-end period, during which everyone, regardless of occupation, is closely employed. In the breakdown by day, most patients consulted on Sunday and Monday.

### Age distribution:

The mean overall age of patients was 46.6 years for males and 46.8 years for females. Examination of the age distribution by sex revealed that males in their fifties accounted for the highest number of any group (40.7%). Females in their fifties accounted for 25.0%.

Patient Characteristics	n	%
<b>Age (in years)</b>		
20-29	8	18.6
30-39	6	14.0
40-49	7	16.3
50-59	15	34.9
60 and over	7	14.0
<b>Sex</b>		
Male	27	62.8
Female	16	37.2
<b>Occupation</b>		
Specialist	2	4.7
Company employee	6	14.0
Agriculture	13	30.2
Housewife	4	9.3
Student	1	2.3
No fixed occupation	12	27.9
Others	5	11.6
<b>Support institution prior to attempt</b>		
None	23	53.5
Psychiatric inpatients or outpatients	12	27.9
General practitioners	8	18.6
<b>Precipitating factors</b>		
Interpersonal relations	13	30.2
marital	8	
parent-child	3	
opposite sex	2	
Physical illness	9	20.9
Psychiatric illness	7	16.3
Living environment	5	11.6
Occupation	3	7.0
Financial problems (loan, etc.)	3	7.0
Unknown	3	7.0
<b>Diagnosis (ICD-9)</b>		
Affective psychosis (including depressive)	11	25.6
Alcohol-drug dependence	6	14.0
Acute reaction to stress	5	11.6
Schizophrenia	4	9.3
Personality disorders	3	7.0
Adjustment reaction	3	7.0
Organic psychotic condition	1	2.3
Neurosis	1	2.3
Paranoid states	1	2.3
Unknown	8	18.6

**Occupation:**

Agriculture was the occupation most often cited (30.2%), followed by no fixed occupation (27.9%). It appears that there is a relationship between the occupation (agriculture) and the method used.

**Previous history of suicide attempts:**

Patients who did not seek help from a medical institution accounted for 35.5% of the total number. Those who had been admitted to the neuro-psychiatric ward or an outpatient clinic accounted for 27.9% and 18.6% were treated by general practitioners.

**Treatment received prior to suicide attempt, precipitating factor and diagnosis:**

Examination of the motivation revealed that the main precipitating factors towards suicide were interpersonal relations, such as marital relation, the parent-child relation, and relations with the opposite sex, accounted for most of the attempts (30.2%), followed by difficulties related to physical disorders (20.9%) and to psychiatric disorders (16.3%).

With regard to the diagnosis based on ICD-9, results showed that 11 patients were classified as affective psychosis (25.6%), six patients (14.0%) as alcohol or drug dependence, and five patients as having acute reaction to the stress (11.6%). An examination of the prognosis showed that 18 patients died (41.9%), and the cause of death in all cases was paraquat.

Repeated attempts of suicide constitutes one of problems. But no one who attempted suicide using agricultural chemicals relapsed during the course of the study.

**DISCUSSION**

The problem of attempted suicide using agricultural chemicals has attracted a great deal of attention over the past two decades. In southern Florida (Reich et al, 1968), 57% of all attempts used agricultural chemicals, and the mean overall age of the patients was 46. In addition, Venkoba Rao (1971), in India, reported on a study in 1971 in which 68% of all suicides were by agricultural chemicals, and that the persons involved were all quite young, 88% being 30 years old or younger. Berger (1988) reported that in Sri Lanka, a country with one of the world's highest suicide rates (29 per 100,000 in 1980), poisoning by agricultural chemicals was the method most often used. From a 1980-1985 survey conducted in Jordan, 30.6% of all suicide attempts used agricultural chemicals, the highest total for any category (Daradkeh, 1989).

With regard to the age distribution of patients who attempted suicide with agricultural chemicals, 15 were in their fifties (34.9%), accounting for the largest group. However, these results differ from those in India (Venkoba Rao, 1971) and Jordan (Abu Al-Ragheb & Salhab, 1989), in which younger people accounted for most of the cases. One of the reasons may be that suicidal ideas in older people are stronger than that in younger people in Japan. In our clinical experience, younger people often used psychotropic drugs as a method of attempting suicide and there might be an expectation to be rescued among younger people in Japan.

A survey by Dickstra from 1979-1986 at Leiden University in the Netherlands conclusively showed that roughly half of the patients received treatment for a short time prior to their attempt, and general practitioners did not play an important role in the prevention of suicide attempts (Dickstra et al, 1989). It is clear that chronic physical illness such as liver cirrhosis, diabetes and hypertension are precipitating factors of suicide, even granting that it is difficult to predict suicides prior to the attempt and that in most cases even a psychiatrist would be unable to prevent. It is important that the psychosocial characteristics of patients with chronic physical illness be fully understood (Hengeveld et al, 1988). There should exist systems by which general practitioners can swiftly consult with psychiatrists when necessary.

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