Common Drugs Used for Suicidal Attempts: A Prospective Hospital Based Study in Saudi Arabia

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ABSTRACT

A total of 80 patients with ages ranging from 13 years to 35 years attended the Emergency Unit of Riyadh Medical Complex with strong history and drug screening evidences of suicidal attempts. Drugs used in these attempts were Analgesic (35%), Antibiotic (11.25%), CNS Stimulant (11.25%), Anti-depressant (7.5%), Cough Preparation (6.25%), Antipsychotic (6.25%), Oral Hypoglycemic (3.75%), Antiasthmatic (2.5%), Antiepileptic (2.5%), and Miscellaneous (13.75%). The evidence of single drug ingestion was 55%. This study also showed a strong female predominance (86%), 79% of whom were single, and 59% of them were of average income group.

Socio-economic problems, family conflict, and limited freedom of the females in the society with relatively less educational facilities were thought to be the major causes of suicidal attempts. However, drug-screening techniques used provided an early and accurate detection of the poisonous agents so that the immediate and appropriate management could be done resulting in an excellent prognosis.

(Key Words: drug screening; suicide; overdose; drug investigation; emergency medicine; health studies)

INTRODUCTION

All substances known to man are poisonous; and it is the dose, which determines the effect. The history of poisoning is as old as human history itself, and since the earliest times the knowledge of toxins has been updated and refined by humans. Nowadays, and after the great development in drug manufacturing, medications have come into the common man's reach. Drug overdose means exposure to an excessive amount of drug, which could be accidental or intentional.

In many hospitals, acute poisoning is the most common reason for the admission of young persons to a medical ward. Such poisoning is usually by self-administration of prescribed or over-the-counter medicines, or of drugs used in substance abuse. All suicidal threats should be taken seriously, and particular care should be taken when prescribing and dispensing medications, which may be fatal in overdose. Adolescents' suicide attempts by medicaments tend to be more severe than childhood accidental ingestion, resulting in hepatotoxicity and/or renal failure, which may be two- to six-times higher than in younger children.

In the past, it was difficult to identify or to measure drug levels. The clinically related effect (e.g., resolution of fever when pneumococcal pneumonia is treated with benzylpencillin) or pharmacological effect (e.g., blood clotting during treatment with anticoagulants) were used as guiding principles for dosage and efficacy. In recent years, the identification techniques of drugs have greatly improved. The continually improved instrumentation and methodology applied for toxicological analysis made qualitative and quantitative detection of drugs easy and fast.

In this prospective study we have tried to identify the drugs, which were frequently used for suicidal attempts by the subjects under the study. Similarly, we tried to identify various contributory factors for such attempts and the preventive measures to restrict such incidences.

MATERIALS AND METHODS

Eighty cases (11 males and 69 females) with suicidal attempts that came to the Emergency of Riyadh Medical Complex after exposure to excessive amounts of drugs were studied, and the results thus obtained were analyzed.

The drugs identified by drug screening were of 10 types: Analgesics (used for the relief of pain like Panadol), Antibiotics (antibacterial agents like Erythromycin), CNS Stimulants (stimulating the central nervous system like Caffeine), Antidepressants (used to get rid of depression like Tricyclic antidepressants), Antipsychotics (used to treat psychosis like Phenothiazines), Cough Preparation (used to relief cough like Actifed), Oral Hypoglycemic drugs (used to control diabetes like Daonil), Antihistamines (used to control histamine like Cimetidine), Antiepileptics (used to control epilepsy like Tegretol), and Miscellaneous (Table 1).

Table1: Drug Groups Identified in Suicidal Poisoning – Distribution and Management.

Drug Group	Distribution of Cases						Management			Final Outcome
	No.	Age	Sex		Nation.		NT	ER	AD	
			♀	♂	S	NS				
Analgesics	28	14-30	26	2	15	13	12	0	16	Good
Antibiotics	9	16-35	8	1	8	1	4	1	4	Good
CNS Stimulants	9	15-35	9	0	7	2	5	2	2	Good
Antidepressants	6	14-32	6	0	4	2	0	0	6	Good
Antipsychotics	5	17-23	4	1	4	1	1	1	3	Good
Cough Preparations	5	17-30	4	1	3	2	3	1	1	Good
Oral Hypoglycemic	3	19-31	2	1	3	0	1	1	1	Good
Antiasthmatic	2	20-21	2	0	1	1	0	0	2	Good
Antiepileptics	2	14-36	1	1	1	1	0	0	2	Good
Miscellaneous	11	13-30	10	1	7	4	8	0	3	Good

Table Definitions: Nation. = Nationality. S = Saudi. NS = Non-Saudi. NT = No Therapy. ER = Emergency Care. AD = Admission.

The techniques used in detecting the presence and the level of particular drugs in serum and urine (drugs of abuse or therapeutic importance) follow the immunochemical and chromatographic principles.

Chromatography, the most frequently used analytical technique, involves a separation method based on the flow of a mobile liquid or gas over a solid or stationary phase containing the unknown compound. In thin layer chromatography (now packed in a complete kit as TOXI-LAB, IRVIN U.S.A), each drug can be identified by its Rf (relative retention time), but also by its color and characteristic color change in different reagents. These patterns are reinforced by fluorescence characteristics.

The automated system TDX-FLX, ABBOTT, U.S.A, which is based on fluorescence polarization immunoassy was used for quantitative detection of commonly used/abused drugs. The use of the TDX/FLX machine is simple, accurate, and involves a short turnaround time.

RESULTS

The drug screening techniques identified several drugs commonly encountered in suicidal poisonings. These were grouped into the following 10 categories: Analgesics, Antibiotics, CNS Stimulants, Antidepressants, Antipsychotics, Cough Preparations, Oral Hypoglycemic drugs, Antihistamines, Antiepileptics, and Miscellaneous.

1. Analgesics Poisoning: Analgesics were recorded in 28 cases, 15 cases were Saudi national, and 13 cases were non-Saudis. All of them were in the age group of 14-30 years with a sex distribution as two males/26 females (Ratio 1:13). Out of the 28 cases, 16 were admitted in the wards to receive specific therapy, while the remaining 12 cases did not require any therapy.

2. Antibiotics Poisoning: In this group there were nine cases; eight cases were Saudi national, and one case was non-Saudi. All of them were in the age group of 16-35 years with male/ female Ratio of 1:8. According to the management of the nine cases, four cases did not require any therapy, one received Emergency Care, and the remaining four cases were admitted in the wards.

3. CNS Stimulants Poisoning: This group consists of nine patients; seven were Saudi, and two were non-Saudi. All of them were females, age ranged from 15-35 years. In the management of the nine cases, five cases did not require any therapy, two received Emergency Care, and the remaining two cases were admitted in the wards.

4. Antidepressants Poisoning: There were six cases (four Saudi and two non-Saudi) of antidepressant poisoning. All the cases were females of the age ranging from 14-32 years. All of them were admitted in the wards. The final outcome of all the cases was good.

5. Antipsychotics Poisoning: Antipsychotic drugs were recorded in five cases; four cases were Saudi national, and one case was non-Saudi. All of them were in between 17-23 years with male/ female Ratio of 1:4. One case did not need any therapy, one received Emergency Care, and the remaining three cases were admitted in the wards.

6. Cough Preparations Poisoning: Three Saudi and two non-Saudi were in this group. The age range was 17-30 years with male/ female Ratio of 1:4. Three of the cases did not need any therapy, one received Emergency Care, and one case was admitted in the wards.

7. Oral Hypoglycemics Poisoning: This group contained three Saudis. They were in the age group of 19-31 years with one male/two females. One case did not need any therapy, one received Emergency Care, and one case admitted in the wards. The final outcome of all the cases was good.

8. Antiasthmatics Poisoning: This group consisted of one Saudi and one non-Saudi. They were both males in the age group of 20-21 years and both cases were admitted in the wards.

9. Antiepileptics poisoning: It was recorded in two cases; one Saudi and one non-Saudi. They were in the age group of 14-36 years with male/ female Ratio of 1:1. Both cases were admitted in the wards.

10. Miscellaneous poisoning: This group comprised 11 cases (seven Saudi plus four non-Saudi). They were in the age group of 13-30 years with one male /10 females (Ratio 1:10). Eight cases did not need therapy, and the remaining three cases were admitted in the wards.

DISCUSSION

It is believed that females attempt suicide three times more frequently than men (Viccellio, Peter 1993), but in our study it had been found that females attempt suicide six times more frequently than males (69 females, 11 males). This could be due to the socio-economical factors, old traditions, and lack of education of the population under the study.

Seventy nine percent of the cases were unmarried (63 cases), and the remaining were married (17 cases) (see Table 2). This means that suicidal attempts were less common among married individuals, perhaps because marital status gives some stability in life.

Table 2: Age Distribution in Suicidal Poisonings.

Age Group	Sex		Nation.		Symptoms on Arrival			Marital Status			Economic Status		
	♀	♂	S	NS	Cons.	Coma	Other*	Single	Married	Divorced	P	A	R
11-20	36	2	14	10	14	3	21	37	1	0	15	23	0
21-30	29	6	18	17	9	3	23	24	10	1	13	22	0
31-40	4	3	3	4	0	1	6	2	4	1	6	1	0

Table Definitions: Nation. = Nationality. S = Saudi. NS = Non-Saudi. Cons. = Conscious. P = Poor. A = Average. R = Rich. (Other* includes such symptoms as nausea, vomiting, anxiety, diarrhea, and/or abdominal pain)

It is observed that all the suicidal cases were either from the average socioeconomic status 59% (monthly income 3,000-6,000 SR), or from the poor status 41% (monthly income >3,000 SR), and no suicidal attempts were found among the rich class (Income > 6000 SR). This indicates that poverty leads to frustration and thus results in such attempts. Regarding the management of these cases, 41 out of 80 cases did not require therapy, six received Emergency Care, and 33 cases required admission to the hospital.

Suicidal attempts with single drug ingestion was observed in 55% of the cases, and with multiple drugs ingestion 21% was recorded, while 24% of the cases had negative drug screening. This reflects that suicidal attempts with single drug were more common, because one drug could be easily procured. In most cases of negative screening, the history of drug ingestion was not reliable.

The drug group with the highest ratio in suicidal poisoning was analgesic. Our findings are in agreement with those of the others (Mofenson, Haward, 1993). Analgesic poisoning was recorded in 28 cases (35% of suicidal cases). This ratio was high when compared with other suicidal groups like antihistamine, which accounted for only 2.5% of the cases. These findings support the fact that analgesics are rampantly used and stored in a bulk.

The final outcome of all suicidal cases was good, which was mainly due to the qualitative and quantitative drug screening and to the prompt medical services in the Kingdom. Also in 24% of the cases it was proved that nothing was really ingested, and in 21% of them the ingested amount was relatively low and didn't result in any toxicity.

It had been found that all suicidal cases in this study were of the age range of 11-40 years. This supported the recent findings that intentional exposures were very common between adolescents and young adults, whereas there were no suicidal attempts among children (Writer, James V. 1993). In this age range, socio-economic problems as well as family conflicts and psychosis were the main cause for almost all the cases. Psychosis was the only cause in the suicidal attempts of Saudi males and females. However, no psychosis was observed in non-Saudi subjects.

Nine percent of the suicidal attempts (seven cases) came with coma, while the remaining cases were either conscious or had mild symptoms. Out of the seven comatose cases, five were females, indicating that females were at higher risk to complete suicide than males. This was a new finding in our study, because most of the earliest studies contradict this (Fochtmann, Laura J. 1993). This is attributed to the fact that females were suffering more from the prevailing traditions of the society. These traditions tend to give less freedom and less opportunity for proper education to females as compared to males of similar groups.

The marital status of 79% of the suicidal cases was 'single', and they were of either 'poor' (41%) or 'average' (59%) economic status. There were no suicidal attempts among the rich. This supported the findings of Fochtmann, Laura K. 1993, because marriage and money seems to provide stability.

CONCLUSIONS

This study highlights that in local populations, females attempt suicide six times more frequently than males (69 females, 11 males), which is double the rate of earlier reported findings. Unusually, it was found that females were at higher risk to complete suicide than males (three times more). Intentional exposures were very common among adolescents (32.5%) and young adults (67.5 %), whereas there were no suicidal attempts among children. Suicidal attempts were found to be four times more in singles than in married individuals. It has been noted that all the suicidal cases were either from the average economic status 59%, or from the poor status 41%, and no suicidal attempts were found among the rich. About 40% of the suicidal cases were admitted in the wards.

Exposures with a single drug were three times more than with multiple drugs in suicidal attempts and the Analgesics group was found to have the highest ratio (35%). Almost all of the suicidal exposures did not result in severe toxicity and the final outcome of all cases was good. This signifies the importance of prompt medical services available in the Kingdom.

In the prevention of poisoning, the goal is to separate potential victims from potential poisons. To achieve this policy, smaller quantities of pharmaceuticals supplied in childproof packing should be

bought. Parents should have a close interaction with their children, especially the adolescents and help them to understand and to solve their problems and avoid intentional exposures.

Avoidance of unnecessary poly-pharmacy, selection of alternative agents with lower interaction potential and careful dosage adjustments based on serum drug monitoring and perfect clinical observations are the main methods for reducing the risks associated with drug interactions (Tanaka, E., 1999).

Females should be given equal opportunity in proper education, and they should be given their rights and freedom. Parents should help them to choose their husbands carefully. Polygamy practice as well as family size should be limited.

The most common sources of drugs for attempted suicides were physicians, especially psychiatrists. We therefore conclude that continuous information to physicians on drug overdose is important, and it is also important to introduce alternative strategies to prevent suicidal behavior (Alsen, M. et al., 1994). Psychiatric patients should be treated and should not be exposed to the drug storage cabinet. Special care must be given to those with the history of previous suicidal attempts, because they are at high risk of repeated attempts.

Finally it is suggested that proper and continued education should be a major component of any poison prevention program in the Kingdom.

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