

# ACUTE INTOXICATION WITH DRUGS OF ABUSE AND PSYCHOPHARMACOLOGICAL MEDICATIONS IN THE EMERGENCY ROOM – THE SITUATION IN CAGLIARI, ITALY

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## Abstract

Given the incidence and severity of acute intoxication, this issue is of considerable importance today for the Emergency Departments (ED). The objective of this study was to evaluate acute intoxications by psychopharmacological medications and abuse of drugs for patients managed in an Outpatient Emergency Department. Retrospective analyses were performed on data on admissions to the Emergency Department for the years 2012 and 2013, in Holy Trinity Hospital, Cagliari, Italy; the reference population were outpatients with intoxication reported as the main problem, taken from a total population of outpatients with every kind of medical problem admitted to the ED during the studied period. The sample included patients of all ages with acute intoxication by psychopharmacological medications and drugs of abuse (psychoactive drugs and alcohol). For the year 2012, the number of total Emergency Room (ER) visits because of intoxication amounted to 338 and 243 of these were due to the abuse of drugs (72%), representing 0.72% of the total number of ER outpatients visits ( $n=33823$ ). For the year 2013, this percentage increased reporting 287 outpatients for intoxication by drugs of abuse (79% of those admitted because of intoxication,  $n=362$ ), representing 0.83% of the total number of ER outpatients visits ( $n=34,476$ ). If we consider jointly outpatients with intoxication because of drug abuse for the two years ( $n=530$ ), the descriptive analysis shows that: 56.0% are male and 44.0% females. Yellow as priority code had been assigned in 67.7% cases and red in 9.2% cases ( $\chi^2=10.053$ ,  $df=3$ ,  $p=0.018$ ). Patients with a diagnosis of psychiatric illness were 40.8%; with diagnosis of drug addiction 18.5%, 10.9% alcoholism, drug addiction and alcoholism 2.6%; psychiatric condition associated with drug addiction and/or alcoholism 4.5% ( $\chi^2=85.697$ ,  $df=7$ ,  $p<0.001$ ). The drugs taken were: psychopharmacological medications 46.2%; alcohol 22.6%; mixed drugs and alcohol abuse 13.7% ( $\chi^2=104.870$ ,  $df=8$ ,  $p<0.001$ ). This study showed that there is a high level of comorbidity between psychiatric disease (Bipolar Disorders: 28.7%, Unipolar Mood Disorders: 48.6%, Psychosis: 9.3%, Anxiety Disorders: 10.2%) [1] and acute intoxication in patients who are admitted to an Emergency Department; this data, which show an increase of admissions of such patients during the examined period prove the necessity to reflect on the importance of an appropriate management of this patient population.

**Key words** Intoxication, Abuse, Psychopharmacology, Emergency, Urgency

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## Introduction

The problem of intoxication with substances played an important role in medicine and social sciences, since ancient times when the human being had found through experience the effects that certain substances may have on the individual and had learned to use it and often abuse them[2] If, at the beginning, a drug of abuse produces an effect that is deemed, for its neurobiological

effects, very pleasant, due to a mechanism of endorphin gratification it, soon may manifest toxic effects that often reach alarming levels, not infrequently with a risk for the patient's life. In addition, acute intoxications are a frequent occurrence in psychiatric patients who take an overdose of medications prescribed for home therapy in a suicidal intention. In the current era, where available, Departments of Emergency Medicine

represent a focus in the management of such situations, both for their severity and complexity. In the evaluation of the states of acute intoxications by psychopharmacological medications and drugs of abuse and their correct classification and treatment these departments play a crucial role not only from the point of view of Internal or Emergency Medicine, but also concerning behavioural, psychiatric and social aspects.

### **Aims**

Aim of this study was to describe the clinical and psychiatric issues of this type of patients in the ED. The clarification of the largest possible number of issues regarding the management of acute and chronic poisoning situations and how they should be managed properly in the ED plays a role of primary importance, not only for this type of patients, but also, secondly, for all other classes of users who are treated in the Emergency Department for other primary problems; in fact, the difficulty of management and the overall severity of the states of intoxication is a particularly onerous burden on the structure of EDs and inevitably needs both time and in the use of all available resources.

### **Materials**

We decided to perform that study, on a large cohort of patients referred to a first level Emergency and Acceptance Department, in Holy Trinity Hospital, Cagliari, Italy; a sample of consecutive patients in among a period of two years, from 2012 to 2013, was observed. The total number of outpatients admitted to ER, for any kind of primary problem, we examined in the year 2012 was 33,823, while in the year 2013 the total number

of outpatients admitted to ER was 34,476, making a total of 68,229 observations.

### **Methods**

Based on the initial cohort, by retrospective analysis of a reference population was defined, which including cases recorded with "intoxication" as main problem at the triage, was defined. An expert nurse assigned a gravity and priority code at the admission to ED, based on the clinical history of the patient. The assessment of the disease severity of patient on admission to the Emergency Room (ER) was made on the basis of guidelines of the Italian Ministry of Health [3]. Red Code was assigned to patients with a very critical state of impairment of vital functions, Yellow Code for average critical state, Green Code for uncritical, and Code White to patients without any urgency. (Table 1) On the basis of the colour the urgency of treatment was determined. We included in the sample patients of all ages who were admitted to the ER because acute intoxications from psychopharmacological medications, alcohol and drugs of abuse, such as cocaine or heroin. On this cohort of patients we've evaluated comorbidity and demographics characteristics. In all cases the level of statistical significance of observed differences was placed to a value of "p" equal to or less than 0.05 for two-tailed hypothesis ( $p \leq 0.05$ ). It has been decided to compare nominal data by use of crosstabs, based on the evaluation of the Pearson  $\chi^2$  test (Chi-square) and Fisher's Exact Test to adapt statistical analysis to the sample size; data expressed as continuous variables were instead treated using the Student's "t" Test for independent samples. The results obtained on

the basis of the analysis of the sample have been reported with the aid of tables and discussed by comparison with the actual

available literature. Statistical analyses were done using IBM SPSS® 21.0 (SPSS, Inc., Chicago, IL, USA).

Tab 1. The triage system – with explanation

Triage System	
Code Red	Critical patient, with risk for life and highest priority. Immediate access to treatment
Code Yellow	Potential risk for patient's life, high priority. Access to treatment in 10-15 minutes
Code Green	Visit by the physician delayable, Access to treatment in 60-90 minutes
Code White	No need to admission to ED. Access to treatment in 120 minutes

## Results

In 2012, the number of total admissions because of intoxications in the Emergency Department (ED) amounted to 338, and, of these, 243 were due to drugs of abuse and psychopharmacological medications (72%), which represents 0.72% of the total number of admissions to the ED (n=33,823). In 2013 there was a slight increase in this percentage with 287 admissions due to the same sort of intoxications (79% of those admitted because of intoxication, n=362), which represents 0.83% of the total (n=34,476). Looking at the total admissions treated for this type of poisoning over two years (n=530) treated for this type of poisoning the descriptive analyses show that: 56.0% were males (n=295) (mean age 39.02±12.9) and 44.0% females (n=233) (mean age 42.16±14.1) (t=2.655, df=526, p=0.008) (95% C.I. -5.46 -0.82). At the triage had been assigned code white in 0.4% of cases (males=0.7%, females=0%), green in 22.6% (males=23.9%, females=21.0%), yellow in 67.7% (males=63.3%, females=73.4%) of cases, and in 9.2% red severity code (males=12.1%, females=5.6%) ( $\chi^2=10.053$ , df=3, p=0.018). The assignment of the severity level remained constant in the two years analyzed individually (Table 2). The clinical history of

the patients showed that 40.8% had a diagnosis of psychiatric illness, 18.5% drug addiction, 10.9% alcoholism, drug addiction plus alcoholism 2.6% and 4.5% psychiatric illness associated with drug addiction and/or alcoholism ( $\chi^2=85.697$ , df=7, p<0.001) (Table 3). The substances taken were: psychopharmacological medications 46.2%; alcohol 22.6%; drugs of abuse (such as cocaine, heroin) 14.9%; multiple abuse 13.7% ( $\chi^2=104.870$ , df=8, p<0.001). Analyzing the type of substance abuse, relevant data on gender differences (Table 4) were identified: 70.4% (n=164) of females appear to have taken an incongruous dose of psychotropic drugs, compared with 27.3% of males (n=81); The data on alcohol abuse (patients with or without clinical history of alcohol dependence) are inverted, showing an increased consumption in males (29.3%, n=87) compared to females (14.2%, n=33); we also confirmed that pattern for the drugs of abuse that turned out to be more common in males (21.5%, n=64) than females (6.4%, n=15) [4]. A detailed analysis of the admissions to the Emergency Department because of multiple intoxication (psychopharmacological medications + drugs of abuse, psychopharmacological medications + alcohol, alcohol + drugs of

Tab. 2. The assignment of the severity level in 2012 and 2013

Year 2012	Male (n, %)	Female (n, %)	$\chi^2$ test	df	p Value
			1.846	2	0.397
Triage. Code White	-	-			
Triage. Code Green	29 (23.4)	25 (21.0)			
Triage. Code Yellow	80 (64.5)	85 (71.4)			
Triage. Code Red	15 (12.1)	9 (7.6)			
Year 2013	Male (n, %)	Female (n, %)	$\chi^2$ test	df	p Value
			9.225	3	0.026
Triage. Code White	2 (1.2)	-			
Triage. Code Green	42 (24.3)	24 (21.1)			
Triage. Code Yellow	108 (62.4)	86 (75.4)			
Triage. Code Red	21 (12.1)	4 (3.5)			

Tab. 3. The clinical history of the patients

Diagnosis	Male (n, %)	Female (n, %)	Tot (n, %)	$\chi^2$ test	df	p Value
				85.697	7	<0.001
Psychiatric Disease	73 (24.6)	143 (61.4)	216 (40.8)			
Drug Addiction	79 (26.6)	19 (8.2)	98 (18.5)			
Alcoholism	43 (14.5)	15 (6.4)	58 (10.9)			
Drug Addiction+Alcoholism	10 (3.4)	4 (1.7)	14 (2.6)			
Psychiatric Disease+Drug Addiction and/or Alcoholism	18 (6.1)	6 (2.6)	24 (4.5)			

Tab 4. The type of substance abuse analysis

Substance	Male (n, %)	Female (n, %)	Tot (n, %)	$\chi^2$ test	df	p Value
				104.870	8	<0.001
Psychopharmacological medications	81 (27.3)	164 (70.4)	245 (46.2)			
Alcohol	87 (29.3)	33 (14.2)	120 (22.6)			
Drugs of abuse	64 (21.5)	15 (6.4)	79 (14.9)			
Multiple abuse	65 (21.8)	19 (8.2)	84 (15.8)			

abuse, psychopharmacological medications + drugs of abuse + alcohol), is further confirmed by a greater representation of the male sample (21.8%, n=65) compared to women (8.2%, n=19) ( $\chi^2=104.870$ , df=8, p<0.001). The discharge from the Emergency Department occurred in different ways: 37.4% of patients were admitted to a hospital ward; of these, 79.3% (n=198) had a priority code yellow at the admission and 15.7% (n=31) code red; 22.5% (n=19) were sent home; 17.8% were gone before the conclusion of the diagnostic and therapeutic process or did not return from specialist visit (n=94) and 8.7% (n=46) had left

the hospital before any medical evaluation had been done. Analyzing more hospital wards where admissions had been made, it appears that in 74.4% (n=163) of the cases, patients had been admitted to an Internal Medicine department, in 11% of cases (n=24) were kept under intensive observation in the Emergency Room and in 8.7% (n=19) were sent to a Department of Psychiatry ( $\chi^2=18.445$ , df=8, p=0.018).

### Discussion

The study shows that intoxications by drugs and substances of abuse appear to be slightly increasing in the examined period

examined, while no changes are seen concerning the severity of the intoxications on arrival of the patients at the Emergency Department as measured by a standardized colour code. The assignment of the admission code in ED showed a negligible undertriage, with only 0.6% (n=2) of patients who have received a code yellow to be discharged from the department with a severity code red. Considering instead the overtriage, 28.6% of patients (n=14) with code red were discharged from the Emergency Department with a code yellow[5]. Descriptive analysis of the sample shows a higher prevalence of male and adult patients; this data are peculiar of this cohort of patients, actually there is no study similar to this one in Cagliari or Sardinia. According to an analysis of the medical history provided by the patient or taken from the previous admission data in the Emergency Department, it is clear that in our sample the intoxicated patient presents in most cases with a history of psychiatric pathology and the type of substance abuse in this case is represented basically by psycho-pharmacological medications that the patient had at his disposal for home therapy.

The patient who instead has a history of drug abuse appears to have taken drugs of abuse combined or not combined with alcohol or psychopharmacological medications. Alcohol intoxication was more frequent in patients who already had a history of chronic alcoholism. In 20.4% of cases (n=108), the patient had no history of psychiatric illness or substance abuse or it was not possible to collect an adequate clinical history. The department in which the majority of patients

were addressed with acute intoxication were treated is Internal Medicine; in fewer cases the patient is kept under in an intensive observation structure of the ER and discharged as soon as the clinical conditions have stabilized. All patients hospitalized in a Psychiatry Department had exclusively abused psychoactive drugs. It is alarming that a large part of the sample did not complete the diagnostic and therapeutic process after evaluation by the physician, not coming back from the specialist visit or had even, been leaving the Emergency Department before evaluation or before the assignment of a priority code. From the group of patients who had left the hospital before medical examination 69.6% (n=32) were recorded with green code and then judged as patients with low priority on admission, while 28.3% (n=13) with code yellow and mean critical state.

### Conclusions

The intoxication is a clinical condition of urgency that can quickly evolve into a state of real emergency. The initial assessment provides a rapid classification of the patient in such a way as to quickly identify potentially life-threatening situations and limit the organic effects of the toxic substance. Often the effect of the intoxicating substance is not obvious in the beginning so that the patient can arrive in ER asymptomatic. A good knowledge of the typical profile of the harmful effects of the most common substances (cocaine, heroin, alcohol, benzodiazepines) and, where appropriate, the use of specific antidotes can limit the damage and lead to a rapid resolution of the clinical condition. Although the number of patients with this type of problem

represents less than 1% of total admissions to the ER in both years analyzed, they nevertheless turn out to be a type of patients that are certainly not easy to manage [6], especially due to the difficulty to get a proper history, which makes the immediate identification of the intoxicating substance complicated.

### Resumo

Pripensante la incidencon kaj gravecon de akutaj toksigoj, tiu problemo konsiderinde gravas hodiaŭ en urĝkazejoj (UK). La celo de tiu ĉi esplorado estis ekzameni la kazojn de gemalsanuloj kun akutaj toksigoj per psikofarmakologiaj medikamentoj kaj la misuzo de substancoj kiuj estis kuracitaj en UK. La datenoj de gemalsanuloj kiuj venis en la UK de la Hospitalo de la Sankta Trinitato en Kaljaro, Italio, dum la jaroj 2012 kaj 2013 estis retrospektive analizitaj; la esplorita grupo konsistis el gemalsanuloj kun toksigo kiel la raportita ĉefa problemo, rekrutita el totala grupo de ĉiuj gemalsanuloj kun iu ajn sanproblemo, kiuj estis kuracita en la sama UK dum la sama tempoperiodo. En la esplorita grupo troviĝis gemalsanuloj de ĉiu aĝo kun akuta toksigo per psikofarmakologiaj medikamentoj au misuzo de substancoj (alkoholo kaj aliaj). En la jaro 2012, 338 personoj venis al la UK kaŭze de toksigoj, kaj 243 el ili venis kaŭze de toksigoj per substancoj (72%), do 0,72 % de la kompleta kvanto de personoj, kiuj estis kuracita en la UK (n=33823). En la jaro 2013, tiu procentaĵo eĉ altiĝis, ĉar 362 personoj venis al la UK kaŭze de toksigoj, kaj 287 el ili venis kaŭze de toksigoj per substancoj (79%), do 0,83 % de la kompleta kvanto de personoj, kiuj estis kuracita en la UK (n=34476). Se ni rigardas al la gemalsanuloj, kiuj venis al la UK dum tiuj du jaroj kune (n=530), la analizo montras ke 56 % estis viroj kaj 44 % inoj. Taksite lau graveco de la simptomoj, "kodo flava" kiel indiko de prioritato estis aljuĝita al 67,7 % de la kazoj, kaj "kodo ruĝa" al 9,2 % de la kazoj ( $X^2=10.053$ ,  $df=3$ ,  $p=0.018$ ). 40,8 % de la pacientoj havis historion de psikiatra malsano; 18,5 % dependecon de drogaĉoj; 10,9 % alkoholismon, 2,6 % alkoholismon kaj dependecon de drogaĉoj; 4,5 % psikiatran malsanon en kombino kun drogaĉdependenco kaj / au alkoholismo ( $X^2=85.697$ ,  $df=7$ ,  $p=0.001$ ). La substancoj, kiujn la pacientoj konsumadis estis: psikofarmakologiaj medikamentoj

46,2 %; alkoholo 22,6 %; diversaj substancoj kaj misuzo de alkoholo 13,7 % ( $X^2=104.870$ ,  $df=8$ ,  $p=0.001$ ). Tiu ĉi esploro montris, ke ekzistas granda malsankuneco de psikiatra malsano (bipolara malsano 28,7 %, unipolara malsano de etoso 48,6 %, psikozo 9,3 %, angoraj malsanoj 10,2 %) [1] kaj akutaj toksigoj koncerne gemalsanulojn, kiuj estas kuracitaj en UK; tiuj datenoj, kiuj montras plialtiĝon de aliroj de tiuspecaj pacientoj dum la ekzamenita tempoperiodo pravas la neceson pripensi kiel grava la tauga kuracado de tiu pacienta populacio estas.

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