

# CHARACTERISTICS OF ACUTE INTOXICATIONS WITH REGARD TO CAPACITY FOR EFFECTIVE DOCTOR-PATIENT COMMUNICATION AND COMPETENT INFORMED DECISIONS

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## ABSTRACT

**INTRODUCTION:** Altered mental status caused by certain acute poisonings creates barriers for effective doctor-patient communication and compromises the process of informed consent (IC) for treatment. A categorization of toxicological patients with regard to communication capacity would be helpful for practical purposes.

**AIM:** This article has the following aims:

- ◆ characterization of toxicology patients with mental status altered by poisoning according to the etiology of intoxication;
- ◆ discussion of the impact of cerebral toxic syndrome on the capacity for effective communication between the doctor and the patient and for IC.

**MATERIALS AND METHODS:** A retrospective study of the medical documentation of 2088 patients with acute intoxications, treated in the Clinic of Intensive Treatment of Acute Intoxications and Toxicallergies at Naval Hospital, Varna during the 2010–2013 period: case files, IC forms, was conducted. The R program package, version 3.4.2 (2017-09-28), was used for statistics.

**RESULTS:** Toxic cerebral syndrome was found in 966 cases of acute intoxication, 46% of all patients, with especially high percentages in the medicament, alcohol, and narcotics intoxication groups. Regaining lucid mental state was observed within 1 hour in 21.9% of patients, and for the rest, it took from 2 hours to 7 days. Only 1211 patients, or 58%, signed the admission IC form themselves.

**CONCLUSION:** Characterization of acute intoxications with regard to capacity for effective doctor-patient communication is necessary because of the great percentage of patients with cerebrototoxic syndrome. Good knowledge of the specificity of toxicology patients and good communication skills of physicians can help the proper process of informed decisions of the patient.

**Keywords:** *intoxication, cerebral toxic syndrome, effective communication, informed consent*

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## INTRODUCTION

The effective communication between the physician and the patient is one of the basic prerequisites for good-quality diagnostic and therapeutic results in medicine (1–5). Ideally, in an effective communication cycle, the information from the communicator—physician, is translated without any distortion to the recipient—patient, who then thinks it over carefully, in full consciousness, makes a decision, and sends it back to the communicator (2,4,6,7). The ability of both communicating sides to receive and assimilate information, make decisions according to it, and send back information is of key importance for the quality of communication (2,5,9–12). There are different types of communication barriers in clinical medicine: physiological, psychological, cultural, environmental, organizational, semantic, and syntactic (6,8,24,25). The first three types are most important in clinical toxicology.

There are few articles strictly discussing communication difficulties in toxicology, but a lot of the problems described in emergency medicine are valid for toxicology patients as well. The communication problems of clinical toxicology patients are part of the general communication problems of clinical medicine but have their own specificity. When there is toxic cerebral syndrome, specific communication barriers may arise at any stage of the intoxication; both in verbal and nonverbal communication (13–16). The founder of Bulgarian clinical toxicology, Prof. Monov, discussed this well-known characteristic of toxicology practice: “First, we see the capacity for contact with the patient. Between the obtundation and the deep coma, a whole scale of impaired contact of the patients with the surrounding world exists, and it is expressed in their change of perception of the world and change in their behavior” (13).

Numerous communication factors are specific in toxicology cases:

### ***I. Factors related to the altered because of the intoxication mental status:***

- ◆ frequently acute and sudden-onset temporary change in cognitive processes, as a result of cerebrotoxic syndrome, that leads to difficulty or impossibility of receiving and processing of information and distorted and incorrect mental picture, ratiocination, and decisions;

- ◆ intoxication-related or premorbid change of emotions;
- ◆ premorbid or intoxication-related change of the will processes, e.g. pathological obstinacy or apathy;
- ◆ frequently—dissimulation; rarely—simulation or aggravation;
- ◆ the initial history is often missing or distorted partially or totally by the patient or the relatives (11, 13–21).

### ***II. Factors related to the patient but without direct connection to the intoxication:***

- ◆ autoaggressive behavior at the present moment or in the past—suicide intentions and attempts, substance abuse or addiction;
- ◆ patients with negative attitude to medical help and hospital treatment;
- ◆ comorbidity—chronic or acute mental disease, serious physical disease;
- ◆ patients who have no knowledge about and/or experience with toxic substances and acute toxicology situations—children, patients with dementia, etc.;
- ◆ patients with social problems;
- ◆ patients with language barriers;
- ◆ patients who are afraid of the potential negative impact of the information about their intoxication on their family, professional, or social life.

All of these factors lead to frequent problems in the process of obtaining IC for treatment (1,3,5,7–10,22–25). They mainly affect the basic factor for IC—the patient’s competency, and thus the informational components and consent components. A lot of problems exist from a legal viewpoint as well. The first rule of IC is that it must be “concrete, voluntary, in advance, and informed,” so a valid IC requires an alert patient with preserved ability to give such consent (1,12). An important feature of communication barriers and the related IC problems in patients with cerebrotoxic syndrome is that they are usually transitional and temporary (13,15–18,20).

## AIM

This article has the following aims:

- ◆ characterization of patients with altered because of acute poisoning mental status with regard to the etiology of the intoxication;

- ◆ discussion of the impact of altered mental status on the capacity for effective communication between the physician and the patient and on the process of obtaining IC for treatment.

## MATERIALS AND METHODS

A retrospective study of medical documentation—preliminary ambulatory consultation, hospital

## RESULTS

There was a great variety in the etiology causes of acute intoxications during the studied period. Several etiological factors suggested high frequency of cerebral changes: ethanol and other alcohols, narcotics, part of the medicaments, part of the pesticides, carbon monoxide (Table 1).

*Table 1. Toxic cerebral changes in different etiological groups of intoxication*

Etiology of Intoxication	Total number in Etiology Subgroup	Mind Changes Due to Toxicity	Percentage of Cerebral Toxicity in This Subgroup	Percentage of Cerebral Toxicity from the Total Number	Conclusion About Communication
All intoxications	2088	966	<b>46.0%</b>	46.0%	highly impaired
Medicaments	436	316	<b>72.5%</b>	15.0%	highly impaired
Ethanol	575	451	<b>78.4%</b>	21.5%	highly impaired
Methanol or EG	41	32	<b>78.0%</b>	1.5%	highly impaired
Narcotics	120	84	<b>70.0%</b>	4.0%	highly impaired
CO and fume gases	58	22	<b>37.9%</b>	1.0%	possible, with problems
Household products	294	5	<b>1.7%</b>	0.2%	possible, rare problems
Organic solvents	36	26	<b>72.2%</b>	1.2%	highly impaired
Pesticides	45	27	<b>60.0%</b>	1.3%	highly impaired
Plants and animals	483	3	<b>0.6%</b>	0.1%	possible

files—history, physical examination, clinical course, discharge summary, and follow-up examination of 2088 patients with different kinds of intoxication treated in the Clinic of Intensive Treatment of Acute Intoxications and Toxicallergies during the period of 2010–2013 was conducted. Twelve patients with pre-existing permanent dementia were excluded from the study. Assessment of the level of consciousness using the Reed scale and Glasgow Coma Scale (GCS) was done. The written IC for treatment at the admission of the same patients was analyzed. Statistical analysis with R program package, version 3.4.2 (2017-09-28), with descriptive statistics, chi-square goodness-of-fit test and test of homogeneity, comparison of difference between two population proportions using Student's t-test, and correlation analysis were conducted.

A total of 966 patients, or 46% of the total number of patients, during the period had some form of quantitative or qualitative alteration of the mental status caused by intoxication.

The percentages of patients with preserved lucid mind and of those with cerebrototoxic syndrome were different in the different etiology groups. The highest percentage of cerebrototoxic syndrome was found in the group of ethanol intoxications—450 out of a total of 575 patients, or 78.2%; medicament intoxications—317 out of a total of 436 patients, or 72.7%; narcotics—85 patients out of a total of 120 patients, or 70.8%. A low percentage of cerebrotoxic changes was found in the groups of household poisonings—29 out of a total of 296 patients, or 9.8%, and especially in the group of animal envenomations

and plant poisonings—8 out of a total of 493 patients, or 1.6% (Fig. 1).

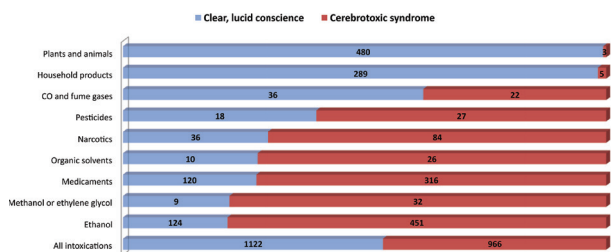


Fig. 1. Prevalence of cerebrotoxic changes in etiology subgroups

♦ possible, effective communication when the physician has good communication skills—alert and responsive patients, including those with emotional instability—1134, or 53.8%.

There was variety in the reported causes and motives for intoxication as well. Only 788 cases were accidental poisonings, or 37.7%. In 440 cases, or 21.1%, there was substance abuse, and in another 251 cases, or 12.0%—addiction to different chemical agents. A total of 609 cases, or 29.2%, were suicide attempts (Table 3). In 97 cases of the suicidal poisonings, or 16%, it was a second suicide attempt, and in

Table 2. Capacity of effective communication at admission according to the initial assessment of the mental status (N=2088)

Possibility of Effective Communication	Number of Patients	Percentage
<b>Possible communication when the communicator has good communication skills</b>		
♦ GCS 13-15	1124	53.8%
♦ Clear mind		
♦ Clear mind but with emotional instability		
<b>Difficult communication, unclear effectivity even in case of skilled communicator</b>		
GCS 9 - 12	649	31.1%
♦ Obnubilation		
♦ Somnolence		
♦ Part of milder cases of psychomotor agitation		
<b>Impossible communication even in case of skilled communicator</b>		
♦ GCS 8 or less	315	15.1%
♦ Coma		
♦ Sopor		
♦ Delirium		
♦ Severe cases of psychomotor agitation		

*P*<0.001 according the chi-square test of homogeneity.

The alterations of mental status caused by intoxications could be divided into 3 groups with regard to the capacity for effective communication (Table 2):

- ♦ totally impossible communication—coma, sopor, delirium, and some of those with severe psychomotor agitation—315 patients, or 15.1%;
- ♦ possible but difficult communication with unclear effectiveness, even when the physician has good communication skills—somnolence, obnubilation, milder psychomotor agitation—651 patients, or 31.1%;

49 cases, or 8%—a third or further attempt.

Table 3. Reasons for acute intoxications

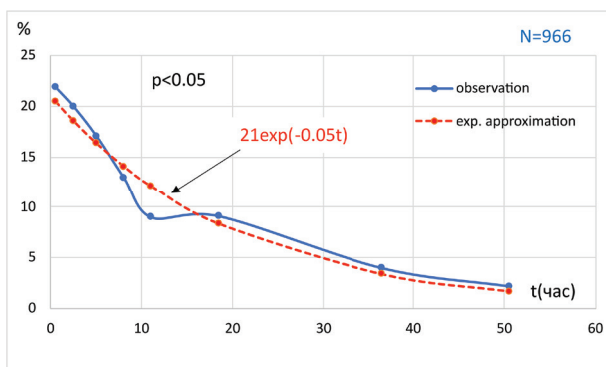
Reasons for Intoxication	Number of Patients	Percentage
Accidental poisoning	788	37.7%
Abuse	440	21.1%
Addiction	251	12.0%
Suicide attempt	609	29.2%
Total number	2088	100%

*P*<0.001 at chi-square test of Pearson

**Table 4.** Time of regaining lucid consciousness of patients with initial mental status altered by acute intoxication (N=966)

Regaining Lucid Consciousness	Number of Patients	Percentage	Exponent
0-1 hours	212	21.9 %	20.5
2-3 h	193	20.0 %	18.5
4-6 h	165	17.1 %	16.4
7-9 h	125	12.9 %	14.1
10-12 h	87	9.0 %	12.1
13-24 h	88	9.1 %	8.3
25-48 h	39	4.0 %	3.4
49-72 h	21	2.2 %	1.7
Over 72 h	19	2.0 %	-
Psycho-organic state	17	1.8 %	-

$\chi^2=1.48$  at *d.f.* = 7;  $p<0.05$



**Fig. 2.** Time of regaining lucid consciousness of patients with initial mental status altered by acute intoxication (N=966)

In cases of alteration of the mind because of intoxication, the initial mental status is changing dynamically during the next hours or days, so a dynamic assessment is necessary. Regaining of lucid mental state was observed within 1 hour in 212 cases,

**Table 5.** Initial signature on the informed consent (IC) form for treatment of patients with acute intoxications

Signature of the Patient Himself/Herself	Signature of Relatives or Lawful Representative	Signature of Friend, Neighbor, etc.	No Signature on IC-form	Total Number of Patients
1211	670	145	62	2088
58%	32%	7%	3%	100%
P<0.001	P<0.001	P<0.001	P<0.001	-

or 21.9%, within 2 to 3 hours in 193 cases, or 20.0%, and the in the rest of the cases—later than that. (Table 4, Fig. 2). Psychomotor agitation at some stage of the intoxication was observed in 343 cases, or 16.4% of all the patients.

The impaired communication between the patients with acute intoxications and the medics created problems in the process of obtaining IC for treatment and, particularly, in the signing of the admission IC form. The IC form was signed by the patient him/herself in only 1211 cases, or 58%. In 670 cases, or 32%, it was signed by relatives or official representatives of the patient, and in another 145 cases, or 7%, it was signed by persons who were not relatives, i.e. friends or neighbors. Sixty-two hospital files did not contain a signed IC. They were mainly patients with acute ethanol intoxication who left the clinic willfully after regaining lucid mental state (Table 5).

A correlation analysis was conducted, which revealed a strong negative correlation between the percentages of patients with cerebrototoxic syndrome in each etiology group and the percentage of patients who have signed the admission IC form themselves (Table 6).

## DISCUSSION

With the increase of global use of medicaments and other chemical compounds with cerebral toxic potential, the probability of acute intoxications caused by them has also increased. This creates a number of problems for the communication between the intoxicated patient and medical professionals, in addition to the specifically medical issues.

There was great variety in the capacity for effective communication in the group of toxicology patients studied during the observed period, which is a reflection of the great etiological variety of acute intoxications (13,14,21). The key factor is the presence

*Table 6. Correlation between cerebrototoxic syndrome and lack of capacity to sign the admission informed consent form*

Etiology	Total Number of Patients in the Group	Patients with Toxic Cerebral Syndrome in the Group	%	Number of Patients Who Signed an IC Form for Admission into Hospital Themselves	%
All intoxications	2088	966	46.3	1211	58.0
Medicaments	436	316	72.5	131	30.0
Ethanol	575	451	78.4	175	30.4
Methanol or ethylene glycol	41	32	78.0	16	39.0
Narcotics	120	84	70.0	39	32.5
CO and fume gases	58	22	37.9	42	72.4
Household products	294	5	1.7	284	96.6
Organic solvents	36	26	72.2	15	41.7
Pesticides	45	27	60.0	30	66.7
Plants and animals	483	3	0.6	479	99.2

of cerebrototoxic syndrome, its gravity and dynamics (13,18,20,21). A significant part (46%) of all the patients admitted with acute intoxications had an altered mental status at the first consultation, which supposed serious potential communication difficulties. We assumed that the presence of toxic cerebral syndrome in more than 45–50% of the cases in any etiological group of acute intoxications indicates a highly impaired capacity for effective communication in this group. The percentage of initial cerebrototoxic syndrome was especially high in the groups of ethanol and other alcohols, medicament, narcotic and organic solvent intoxication. Very low percentage of cerebrototoxic changes was found in the groups of household poisonings and negligible—in animal and plant poisonings. The groups of pesticide poisonings and carbon monoxide intoxications were in the middle of this scale.

It is well known that when patients with deliberate intoxication are alert and responsive that does not mean that they are willing to communicate (4,11,12,16,23). A great part of the studied group of patients had some form of self-harm: suicide attempt, abuse or addiction. Our results confirm an important characteristic of part of the patients with acute intoxication—high percentage of suicide attempts (13-14,23-25). Psychiatric assessment was done after

admission in the hospital and regaining conscience. In this study we are only discussing communication difficulties which are created by an altered by intoxication mental status. When the medics have good communication skills and know well the specificity of toxicology patients, they can achieve effective communication with patients in lucid mind, even in cases of emotional instability (1,2,4,8,9). The communication with patients with intoxication-related obtundation, somnolence, or mild psychomotor agitation is usually possible but difficult and with uncertain effectiveness.

Cerebrototoxic symptoms are dynamic (13,20). After the admission, the mental status can improve, worsen, or it can fluctuate. The time period of regaining a clear mind is different. In 212 cases out of 966 total, or 22%, with initial toxic alteration of the mental status, it took up to 1 hour, and in the rest of the cases, it took from 2 hours to 72 hours. An exponential reduction of the number of the patients regaining lucid and clear consciousness in time was found, which confirms the necessity of a dynamic assessment of the mind in cases of intoxication. However, these results are for all acute intoxications, and great subgroup or individual variability is possible. The dynamics of consciousness of mixed intoxications and of cases with nontoxic cerebral comorbidi-

ty are especially difficult to predict. The dynamics of cerebrototoxic symptoms in acute intoxication require a thorough individual assessment of the mental state by the treating physician and choice of the right moment for effective communication with the patient.

The alteration of mental status because of intoxication and its dynamics in the observed group affected the competency of the patient for informed decisions and had an impact on the process of obtaining IC and its written form. Only 1211 of the 2088 patients, or 58%, signed IC forms at admission themselves. A very high negative correlation between the presence of some clinical form of cerebral toxicity and the capacity of the patient to sign the admission IC himself/herself was established for all acute intoxications during the studied period and also in the etiological subgroups. This confirms the need for further improvement of the process of IC with dynamic assessment of the consciousness and choosing the proper moment to communicate effectively.

A great part of the written forms of IC was signed by relatives or official representatives of the patient—670 IC, or 32%. Less often, in 7%, the IC was signed by another person who accompanied the patient at the admission (friends, neighbors, colleagues). According to the law, such IC is not valid if the patient does not also sign it later. In 63 files, or 3%, no signed IC form was found, mainly patients with acute ethanol intoxication admitted in sopor or coma, who had left the clinic without informing the treating team after regaining consciousness. Such cases create legal problems and show the need of further improvement the communication with this particular group of patients (1,3,5,12,23).

The results of the study of the IC written forms are a reflection mainly of the altered mental status and the inability of the patient to communicate effectively with the surrounding world, including with the physician. This inability can be expressed at the admission or later, at different stages of the intoxication (16,25).

## CONCLUSION

Characterization of the acute intoxications with regard to capacity for effective doctor-patient communication is necessary because of the great percentage of patients with cerebrototoxic syndrome. Good knowledge of the specificity of toxicology patients,

dynamic assessment of the mental status, and good specific communication skills of the physicians and other medical specialists can help the proper process of the patient making informed decisions and, especially, obtaining IC for treatment.

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