Poor outcome in ICU patients acutely intoxicated by street drugs

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Abstract in Dutch/Samenvatting in het Nederlands

In deze studie wordt er gekeken naar de invloed van drugs op het voorkomen van een slechte uitkomst in acuut geïntoxiceerde patiënten. Data van het INTOXICATE-onderzoek wordt hiervoor gebruikt. Dit is een internationaal observationeel onderzoek dat tot doel heeft de behoefte aan opname op de intensive care (IC) te voorspellen bij geïntoxiceerde patiënten. Het onderzoek richt zich op patiënten die met intoxicatiesymptomen worden opgenomen op de IC en beoogt een voorspellingsmodel dat in Nederland is ontwikkeld te valideren met data uit meerdere landen. De gegevens voor het onderzoek werden verzameld uit meerdere IC's in en buiten Europa met behulp van 'Castor'.

Het gebruik van drugs in Nederland is aanzienlijk, waarbij meer dan 10% van de volwassenen ten minste één keer ecstasy heeft gebruikt. Dit is de reden waarom deze studie zich focust op drugs.

Wanneer patiënten met een intoxicatie worden opgenomen op de spoedeisende hulp (SEH), worden ze ingedeeld in een van de vijf toxidromen op basis van hun symptomen: opioïden, sedativa-hypnotica, sympathicomimetica, cholinergisch en anticholinergica. Deze classificaties helpen artsen de oorzaak van intoxicaties te identificeren en de juiste behandeling te geven. Drugs worden in deze studie ook ingedeeld in deze toxidromen

Het onderzoek heeft tot doel het risico op een slechte uitkomst, gedefinieerd als overlijden op de IC, complicaties tijdens opname en/of IC-opnames langer dan 72 uur, te onderzoeken bij IC-patiënten met acute intoxicatie door drugs.

De drugs uit deze studie werden onderverdeeld in categorieën, waaronder sympathicomimetica, opioïden, sedatieve-hypnotica, cannabis en andere drugs. Voor de analyse werden beschrijvende statistieken en logistische modellen gebruikt, waarbij rekening werd gehouden met sociaal-demografische kenmerken, blootstellingskenmerken en ernst in de vorm van complicaties.

De sociaal-demografische kenmerken verschilden per blootstellingsgroep, met verschillen in leeftijd, geslacht en somatische comorbiditeiten. De intentie van blootstelling varieerde ook tussen verschillende blootstellingsgroepen.

De beschrijvende klinische statistieken gaven aan dat bepaalde symptomen vaker voorkwamen bij specifieke drugsgroepen, zoals pijn op de borst bij sympathicomimetica en convulsies bij sedativa-hypnotica.

Verder is er onderzoek gedaan met behulp van logistische regressie om het verband tussen blootstellingscategorieën en slechte uitkomst te onderzoeken, waarbij rekening wordt gehouden met verschillende factoren zoals leeftijd, geslacht, BMI, comorbiditeiten (somatisch en psychisch) en Glasgow coma score (GCS). Van deze factoren waren leeftijd, geslacht, GCS en het hebben van comorbiditeiten van belang voor de uitkomst. Daarnaast bleek dat patiënten met een intoxicatie van een andere substantie dan drugs meer dan twee keer zoveel risico hadden op een slechte uitkomst. Uit de vergelijking van de verschillende drugsgroepen bleek dat sympathicomimetica een 14 keer hoger risico gaven op slechte uitkomst dan de andere groepen binnen de drugs.

Introduction

Patients who are admitted to the Emergency Room (ER) with an intoxication are often referred to the Intensive Care Unit (ICU) for the main reason of observation[1]. However, the in-hospital mortality of these intoxicated patients is low (0.2 - 4.0%) and many ICU admissions are therefore unnecessary[2]. Unnecessary ICU admissions have impact on both capacity of ICU beds and costs[3]. For this reason, a prediction model for the need for ICU admission for intoxicated patients has been developed for ICU admissions in the Netherlands by Raya Brandenburg et al (2017).[4] However, this prediction model and other papers about this topic do not address toxidromes, the basic mechanism for division of intoxicated patients. Toxidromes have not been researched in the context of risk analysis at the ICU.

When patients are admitted to the ER with an intoxication, they are often classified in one of five different toxidromes, namely Opioids, Sedative-hypnotics, Sympathomimetics, Cholinergic and Anti-cholinergic[5]. Patients are classified in these toxidromes based on symptoms and, if known, the exposure. Placing a patient in one of the five toxidromes enables early treatment of the intoxication. Early treatment of intoxicated patients can help prevent bad outcomes like complications or death[6]. Street drugs are often classified in the aforementioned toxidromes as well[5].

The most common street drugs in the Netherlands is Cannabis with a “ever used” percentage of 23.6%. However, in the Netherlands cannabis is tolerated. Illegal hard drugs that are most used are ecstasy (10.1%), laughing gas (7.3%), cocaine (6.3%) and amphetamine (5.1%)[3]. These percentages arouse interest for the implications of these street drug uses.

There is no literature available about the division of street drugs in toxidromes and the comparison of street drugs divided in such groups. In this study, street drugs are divided into toxidromes based on the common symptoms found in literature connected to those street drugs. Furthermore, this study aims to compare the different groups of street drugs (in toxidromes) with one another as well as street drugs as a whole with other intoxication exposures.

Certain socio-demographic, exposure and clinical characteristics are expected to have an effect on the primary outcome: poor outcome[8]. These characteristics are therefore included in this study.

Research question: what role do street drugs have in the risk of poor outcome in acutely intoxicated ICU patients?

Methods

Data

The INTOXICATE study, where this study uses it is data from, is an international, prospective, multicenter observational study. The patients that were included were all intoxicated patients that were admitted to the ICU. In this study, an ICU was defined as a unit where a patient could be endotracheally intubated and mechanically ventilated. This meant that also high-dependency units or high-care units that had the means for mechanical ventilation were considered an ICU.[9,10]

The INTOXICATE study started with data collection on November 1st 2020

For the recruitment of ICUs, different approaches were used. Firstly, the European Society of Intensive Care Medicine (ESICM) endorsed the INTOXICATE study and announced the study to their members (ICUs across Europe) via blast emails. Furthermore, National Coordinators emailed their national ICU network, a website with frequently asked questions has been developed, the study was advertised on websites of the ESICM and European Association of Poisons Centers and Clinical Toxicologists (EAPCCT) and flyers were distributed at national and international symposia and congresses. Further details on ICU participation and data collection, as well as ethics approval, can be read in the INTOXICATE Europe Protocol[10]. All data were entered by ICU doctors/nurses in CASTOR, a clinical data management platform. The data put in CASTOR was checked by any member of the INTOXICATE study. Queries were send when errors were made of more information was necessary. The data used in this study is extracted on June 12st 2023 from castor to R.

The source population was adult ICU patients admitted for acute intoxications. An intoxication was defined as the occurrence of any toxic effect to humans following a single or repeated exposure to a mixture, natural or synthetic substance, available on the market or present in the environment.

The Inclusion criteria to be eligible to participate in this study, a patient must be admitted to the ICU from the ER, ambulance or ward. Furthermore, they should have the intoxication as primary reason for ICU admission. They have to stay at least 4 hours at the ICU and be 18 years or older.

The exclusion criteria were as follows: patients that were admitted at the ICU for less than 4 hours, and patients that were admitted to the ICU for another severe concomitant condition beside the intoxication, were excluded from the study.

The ethical agreement differs per country because of different ethical rules in each participating country. More information on the ethical agreement can be found in the INTOXICATE protocol[10].

Primary outcome

The primary outcome of the study is: ‘poor outcome’. ‘poor outcome’ is a composite outcome defined as in-hospital death, occurring of complication(s) or ICU stay duration > 72 hours.

Complications include the following: acute liver failure, acute renal failure, anoxic brain injury, aspiration pneumonitis, coma, hospital acquired infection, hypertensive crisis, hypoxic-ischemic brain injury and respiratory failure.

Street drug

A “Street drug” is defined as a drug that is taken for nonmedical reason used for mood-altering, stimulant or sedative effects.
To come to a conclusion about what xenobiotics to include and how to divide them in groups, professionals will be consulted to help with this process.

Street drugs are categorized into five main categories: “sympathomimetics”, “opioids”, “sedative-hypnotics”, “street drug others” and “cannabis”;
Sympathomimetics, opioids and sedative hypnotics are all toxidromes. The cannabis was placed in a group alone to see if these intoxications could be included alone. The “street drugs other” group is made for street drugs that could not be placed in the three toxidrome groups.

Statistics

For the statistical analysis of the groups, descriptive statistics and logistic models are used.
The descriptive statistics will be divided into socio-demographic, exposure characteristics and clinical characteristics. In the socio-demographic descriptive there will be looked at age, gender, somatic and psychiatric comorbidities and second reason for admission.
Somatic comorbidity includes the following: chronic cardiovascular insufficiency, chronic hemodialysis, chronic kidney disease, COPD, cirrhosis, dementia, diabetes, hematological malignancy, immunodeficiency, malnutrition, metabolic/endocrine disease, metastasized cancer, primary epilepsy and severe respiratory disease with oxygen use or mechanical ventilation at home.
Psychiatric comorbidity includes the following: addiction and psychiatric disease. The latter is free for interpretation but often used for depression, ADHD, ADD, autism, PTSS and similar conditions.
The exposure characteristics will give information on the intentionality of the exposure and the number of exposures at the same time.
At last, the clinical descriptive statistics will give information on the symptoms: convulsions, thorax pain and coma as well as the Glasgow coma score and duration of stay.
A median with 1st and 3rd quartile will be given for continuous variables and a N with percentage for categorical variables.
Logistic regression is used to analyze the risk differences for the outcome per exposure category while taking demographic and clinical variables into account. For this logistic regression model, R and R studio (version 1.3.1093) are used. The statistical analysis was divided into two models. In the first model, the “else only”, “street drugs + else” and “street drugs only” groups were compared. In the second model, the “sedative hypnotics only”, “opioids only” and the “sympathomimetics only” groups were compared. For both models, known risk factors like age, gender, BMI, somatic comorbidity, psychiatric comorbidity and Glasgow coma score were added to the regression model as independent predictors. Only complete cases will be analyzed. When there are missing values for a particular patient, they will be excluded. The generalized logistic regression will provide an odds ratio with 95% confidence interval.

Results

Division of the street drug exposures

On June 12th 2023, 1891 patients where extracted from castor (fig. 1). Of those patients, 237 did not have an exposure mentioned and where therefore excluded from further analysis. From the 1654 patients left, 942 did not use any street drugs. These patients where therefore put in the group: "else only". The 712 patients that used street drugs could then be divided into "street drugs only" and "street drugs + else". The latter group used a street drug and had another non-street drug exposure at the same time. From the patients that used only street drugs, 8 used cannabis and 5 used a street drug that was defined as "street drug other" (see table 1). These groups were very small and were therefore excluded from further separate analyses. However, these were included into the "street drugs only" group. The 262 patients that were left were divided into "sympathomimetics only", "sedative-hypnotics only", "opioids only" and "two or more street drug types". The last group included patients that, for example, used a sympathomimetic and an opioid at the same time.

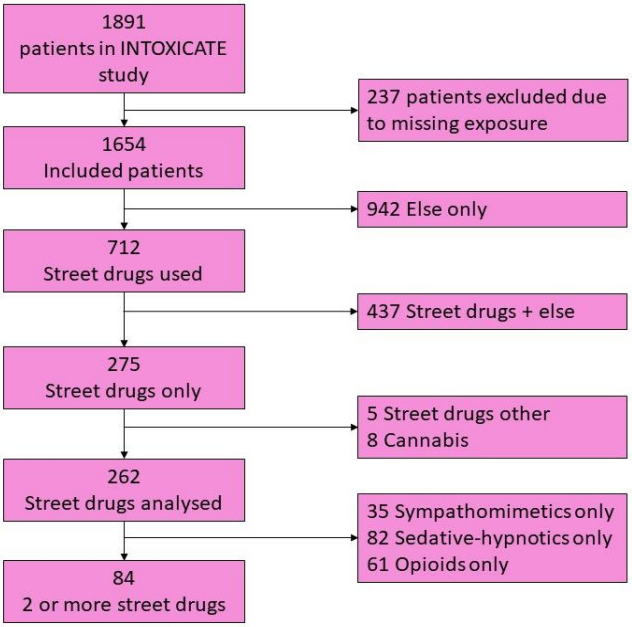

Figure 1: All INTOXICATE patients extracted out of castor on 12-06-2023 (N = 1891) divided in a flow diagram

The division of the different street drug exposures of the acutely intoxicated patients from the INTOXICATE study is shown in table 1.

Table 1: division of all the street drug exposures from the INTOXICATE study in five different groups

Sympathomimetic only	**Opioids only**	**Sedative hypnotics only**	**Cannabis**	**Street drugs other**
Cocaine	Tramadol	GHB/GBL	Cannabis	3-MeO-PCE/MEOPCE
Amphetamine (speed)	Oxycodone	Ethanol	THC	Laughing gas
Lisdexamfetamine	Methadone	Alcohol	Marihuana	Psychedelic mushroom
Dexamphetamine	Morphine	Beer	Weed oil	Psilocybin mushroom
Dextroamphetamine	Heroine	Wine		Ayahuasca
MDMA	Fentanyl/Fentanil	Wodka		
Methamphetamin	Codeine	Ketamine		
2-Fluoromethamphetamine	O-desmethyltramadol	Designer benzodiazepines		
3-MMC	Designer opioids			
2C-B				
Alpha-PVP				
4-MMC				
LSD				
Methylphenidate				
Ritalin				

Descriptive characteristics

The socio-economic characteristics are given in table 2. The median age of the sympathomimetics only and the >= 2 street drugs was much lower than those of the other groups. Furthermore, the age and somatic-comorbidity are much higher in the "Opioids only" group than in other groups. It is also remarkable that the percentage of male is higher in all street drug groups, except the opioids, when compared to the non-street drug groups. Lastly, the percentage of psychiatric comorbidity is much higher in the "Street drug + else" group.

The exposure characteristics (table 3) show that the intentionality of the exposure is much higher in the "Sympathomimetics only" group and the "Street drugs + else" group when compared to the other groups. The "Opioids only" group has a much lower exposure intentionality.

Table 4 shows the percentage of patients with convulsions, chest pain and coma. Furthermore, the median GCS and duration of stay are shown per group. The percentages show that chest pain is more common with sympathomimetics and convulsions with sedative hypnotics. However, the occurrence of both convulsions and chest pain is low in general.

Table 2: Socio-demographic characteristics of the patients by group of exposure. Sympat: sympathomimetics; Sedat: sedative hypnotics (including ethanol); Street drugs + else: a street drug exposure at the same time as an else exposure; else: all other exposures in the INTOXICATE study that are no street drugs;

	Age Median (1st qu – 3rd qu)	Male N (%)	BMI Median (1st qu – 3rd qu)	Somatic-comorbidity N (%)	Psychiatric-comorbidity N (%)	2nd reason for ICU admission N (%)
Sympat only (N=35)	33.0 (25.5-38.5)	28 (80.0)	24.7 (21.9-27.2)	7 (20.0)	22 (62.9)	9 (25.7)
Opioids only (N=61)	51.0 (37.0-62.0)	31 (50.8)	24.7 (21.9-27.9)	24 (39.3)	39 (63.9)	7 (11.5)
Sedat only (N=82)	40.5 (28.3-53.5)	64 (79.0)	24.6 (21.6-27.0)	19 (23.5)	46 (56.8)	24 (29.6)
Street drugs only (n=275)	37.0 (28.5-51.0)	190 (69.1)	24.7 (22.0-27.6)	66 (24.0)	153 (55.6)	67 (24.4)
>= 2 street drugs (N=84)	33.0 (26.8-42.3)	65 (77.4)	24.6 (22.9-27.1)	13 (15.5)	44 (52.4)	25 (29.8)
Street drug(s) + else (N=437)	41.0 (30.0-52.0)	208 (47.6)	24.8 (21.9-29.3)	89 (20.4)	346 (79.2)	74 (17.0)
Else only (N=942)	42.0 (27.0-58.0)	355 (37.9)	25.7 (21.9-29.4)	229 (24.3)	597 (63.4)	108 (11.6)

Table 3: Exposure characteristics by group of exposure. Intentional: intentionality of exposure; Number of exposures: amount of exposures at the same time; Sympat: sympathomimetics; Sedat: sedative hypnotics (including ethanol); Street drugs + else: a street drug exposure at the same time as an else exposure; else: all other exposures in the INTOXICATE study that are no street drugs;

	Intentional N (%)	Number of exposures mean (range)
Sympat only (N=35)	34 (97.1)	1.09 (1-2)
Opioids only (N=61)	42 (68.9)	1.13 (1-2)
Sedat only (N=82)	70 (85.4)	1.07 (1-2)
Street drugs only (N=275)	222 (80.7)	1.57 (1-8)
>= 2 street drugs (N= 84)	72 (85.7)	2.58 (2-8)
Street drug(s) + else (N=437)	408 (93.4)	3.66 (2-11)
Else only (N=942)	795 (84.4)	2.16 (1-13)

Table 4: Clinical characteristics by group of exposure. Sympat: sympathomimetics; Sedat: sedative-hypnotics (including ethanol); Street drugs + else: a street drug exposure at the same time as an else exposure; else: all other exposures in the INTOXICATE study that are no street drugs; GCS: Glasgow Coma Score; Chest pain: thoracic pain at admission; duration of stay: length of ICU stay in hours.

	Convulsions N (%)	Chest pain N (%)	Coma N (%)	GCS median (1^{st} qu – 3^{rd} qu)	Duration of stay median (1^{st} qu – 3^{rd} qu) in hours
Sympat only (N=35)	1 (2.9)	3 (8.6)	8 (22.9)	10.5 (3.8 – 14.0)	29.2 (12.0 – 108.9)
Opioids only (N=61)	1 (1.6)	1 (1.6)	18 (29.5)	8.0 (3.0 – 14.0)	24.8 (15.1 – 43.8)
Sedat only (N=82)	7 (8.5)	0 (0.0)	43 (52.4)	3.0 (3.0 – 9.0)	19.3 (11.6 – 41.8)
Street drugs only (N=275)	13 (4.7)	8 (2.9)	103 (37.5)	7.0 (3.0 – 13.0)	21.4 (12.6 – 44.5)
Street drug(s) + else (N=437)	20 (4.6)	8 (1.7)	141 (32.3)	9.0 (3.0 – 14.0)	22.5 (13.5 -44.8)
Else only (N=942)	52 (5.5)	14 (1.5)	223 (23.7)	12.0 (7.0 – 15.0)	35.8 (20.0 – 69.6)

Statistical analysis

Figure 2 shows the number of patients in each group for both models.

Table 5 gives the odds ratio, p-value and the 95% confidence interval of the first model.
The first model shows that all prediction values except for the BMI are significant. This means that higher age (odds/year: 1.02), male gender (odds: 0.65), somatic comorbidity (odds: 1.49) and lower GCS (odds: 0.90) give an higher risk on the occurrence of poor outcome. Psychiatric comorbidity gives a lower risk (odds: 0.71).
The comparison between the "Street drug + else" group and the "Else only" group shows that the chance for poor outcome is more than twice as high for the "Else only" group than for the "Street drug + else" group. The comparison of the "Street drugs only" group with the "Else only" group shows a similar outcome. The "Else only" group gives a twice as high risk of poor outcome than the "Street drugs only".

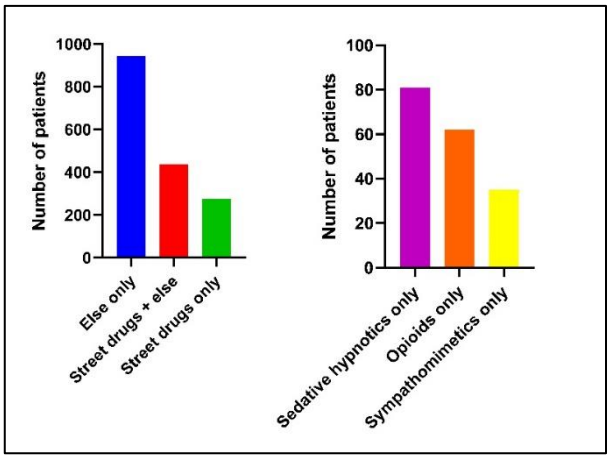

Figure 2: Left: Groups used for the 1st logistic regression analysis: "else only", "combination else + street drug" and "street drug only" (N= 1654 patients). Right: groups used for the 2nd logistic regression analysis: sympathomimetics only or opioids only or sedative-hypnotics only (N= 178 patients). The groups "street drug other" (N = 5) and "cannabis" (N = 8) are too small to be considered.

Table 6 gives the odds ratio, p-value and 95% confidence interval of the second model. The second model shows that somatic comorbidity (odds: 3.05) and a lower GCS (odds: 0.85) give a significantly higher risk for the occurrence of poor outcome.
Out of the logistic regression analysis between the different street drug groups, sympathomimetics were found to have a 14 times higher probability of the outcome than other street drug groups (table 6). The 95% confidence interval however, is very wide.

*Table 5: Logistic regression with else only, combination else + street drugs and street drugs only (N = 942, N = 437 and N = 275 patients, respectively; in total N = 1654 patients). [a] Category "else only" is the reference category. (ORs & 95% Confidence Interval). *statistically significant (p<0.05*

	Odds ratio	P-value	2.5%	97.5%
Age	1.02	< 0.00*	1.01	1.02
Gender	0.65	< 0.00*	0.50	0.84
BMI	1.00	0.840	0.98	1.02
Somatic comorbidity	1.49	0.01*	1.10	2.00
Psychiatric comorbidity	0.71	0.011*	0.55	0.93
GCS	0.90	< 0.00*	0.87	0.92
Street drug + else[a]	0.49	< 0.00*	0.36	0.67
Street drugs only[a]	0.50	< 0.00*	0.34	0.73

*Table 6: Logistic regression with sympathomimetics only, or opioids only, or sedative-hypnotics only (N = 35, N = 61 and N = 82, respectively; in total N = 178 patients). [a] Category "sedative-hypnotics only" is the reference category. *statistically significant (p<0.05)*

	Odds ratio	P-value	2.5%	97.5%
Age	1.01	0.271	0.03	3.69
Gender	0.72	0.516	0.99	1.05
BMI	0.98	0.580	0.89	1.06
Somatic comorbidity	3.05	0.03*	1.16	8.28
Psychiatric comorbidity	1.13	0.787	0.46	2.87
GCS	0.85	0.01*	0.75	0.94
Opioids only[a]	2.24	0.140	0.77	6.69
Sympathomimetics only[a]	14.61	< 0.00*	4.23	57.68

Discussion

This study shows for the first time the differences in a poor outcome between acutely intoxicated patients exposed to street drugs and those with other exposures. Furthermore, the street drug exposures are divided into toxidromes to compare the different toxidromes to one another. This hasn't been done before. To get an idea of the differences in socio-demographics, intentionality and severity between the groups, descriptive characteristics are used.

We found that there are significant differences in the socio-demographic descriptive characteristics between the exposure groups. The age of the "Sympathomimetics only" and the ">= 2 street drugs" groups are much lower and of the "Opioids only" much higher when compared to all other groups. The "Sympathomimetics only" group contains all party-drugs like amphetamine, XTC and cocaine. These party-drugs are often used by young adults, which give a lower mean age for this group[11] . The "Opioids only" group has, beside a lower age, also a higher percentage of somatic comorbidity. These two might be correlated since older people more often have somatic comorbidity then younger people. Besides that, the "Opioids only" group is the only street drug group that does not have a higher percentage of men. Street drugs are often used by men more than women therefore the amount of intoxications in men may also be higher[11]. Lastly, the exposure characteristics show that the "Opioids only" group also has a lower intentionality than other groups. Iatrogenic intoxication may be one of the reasons for this lower intentionality since the group contains a lot of patients with prescriptive opioids. As seen in these results, the opioids often are the odd one out for the socio-demographics. A limitation of this study is that a large proportion of exposures with opioids are misclassified as an exposure to street drugs. Both exposures to opioids as prescribed medication as well as illegal drugs are categorized as an exposure to a "street drug". This has implications for results of this study since the prescriptive opioids are all in one group with little other exposures. The comparison between street drug groups is then not valid. It is then a comparison between street drugs and prescriptive medication.

There was one clear outlier in the duration of stay of the "sympathomimetics only" group, and there could be more outliers in the data that could influence the analyses. However, the outcome of the logistic regression was not influenced by outliers since it used a true or false approach for poor outcome. In this manner, outliers in the data were neutralized.

The convulsions, chest pain and coma symptoms were shown in the clinical characteristics because these where found in literature to be symptoms of street drug intoxications. Chest pain is a common symptom of cocaine and amphetamine intoxications[12,13]. Convulsions are also seen with cocaine intoxications[14]. These street drugs both belong to the "Sympathomimetics only" group. Therefore, you suspect a higher rate of chest pain and convulsions with the "Sympathomimetics only" group. However, as seen in the results, only chest pain gives a higher percentage for this group. The big downside for these complications is that the patients groups as well as the occurrence of chest pain and convulsions is very small. No conclusions can be drawn from these numbers. The coma is more a more common complication in the included patients with a high percentage of coma in the "Sedative-hypnotics only" group. In literature is found that alcohol, which is classified as a sedative-hypnotic often gives coma as a symptom of intoxication[15]. Opioids are also considered as a coma-inducer with intoxication[16]. The results, however, do not show this. The reason for this is unknown.

In the clinical descriptive characteristics, it is striking that the Glasgow coma score (GCS) is lower for all the street drug groups when compared to the else group. Therefore, people with an acute intoxication with street drugs are often in worse shape than people with an intoxication with non-street drugs when admitted to the hospital. Both logistic regression models show that the GCS is a

significant predictor for the occurrence of poor outcome with an odds ratio of 0.9 and 0.85. The same goes for the gender. Being a man is a significant predictor for poor outcome with an odds ratio of 0.65 (only first model) and the street drug groups have a higher percentage of men. However, the results of the first model also shows that the “Else only” group still has a two times higher chance of poor outcome. This suggests that there are other factors that influence the occurrence of poor outcome even more than the GCS and gender.

The clinical descriptive characteristics show that the GCS median of the sedative hypnotics is 3. This tells us that a lot of patients with an intoxication with sedative hypnotics get to the ICU in a very bad condition. Since the biggest part of the “sedative hypnotics only” group consists of patients with an alcohol intoxication, alcohol may play a big role in the bad condition at admission from these patients. It is striking that the lower GCS in the “sedative hypnotics only” group does not affect the duration of stay at the ICU since this group has the lowest median duration of stay of all groups. This could be due to the high amount of experience with alcohol intoxications at the hospital. The “sedative hypnotics only” group does also not have a higher chance of “poor outcome” despite the low GCS.

In the second logistic regression model it is shown that the “Opioids only” and “Sedative-hypnotics only” group do not have a significant difference in poor outcome. However, the “Sympathomimetics only” group gives a 14 times higher chance when compared to the “Sedative-hypnotics only” group. The groups in this model are quite small which possibly gives the big confidence interval for these numbers. The significant big odds ratio for the sympathomimetics are still very interesting. Because the biggest part of the “Sedative hypnotics only” is the alcohol, this result suggest a poor outcome for an intoxication with party-drugs, which is the biggest part of the “Sympathomimetics only” group, is much higher than an intoxication with alcohol.

There are also other remarkable outcomes in this study. Age, for example, only seems to give a 2% higher chance of poor outcome. This was expected to be much higher. Somatic comorbidity is expected to be linked to age. However, in the first model having a somatic comorbidity gives a 1.49 times higher and in the second model a 3 times higher chance of poor outcome. Psychiatric comorbidity, on the other hand, gives a 1.4 times lower risk (in model 1). As seen from the data, a lot of psychiatric disease patients are gotten intoxicated by suicide attempt. These attempts almost never succeed and therefore give a lower risk for poor outcome[17].

Conclusion

This study looked at the occurrence of “poor outcome (death, complications or ICU stay > 72 hours)” as a primary outcome. The street drugs are compared to non-street drugs and there was a comparison between the different toxidrome groups of street drugs. The results of the logistic regression show a two times lower chance of “poor outcome” for the street drugs when compared to non-street drug exposures. Within the street drugs, sympathomimetics have a 14 times higher chance of poor outcome then other street drug toxidrome groups.

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