1
Introduction

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Poisoning is occurring rather frequently and can be treated successfully but clinical symptoms are usually not unambiguous. Therefore, reliable procedures are required to prove or exclude the presence of toxic agents.

Frequency of poisoning

The reported frequency of poisoning differs considerably between various countries not only due to different living conditions, but also due to deviating definitions of poisoning or incomplete data acquisition.

United States: The American Association of Poison Control Centers listed 2.2 million intoxications in 1999 including 5000 deaths from carbon monoxide (Table 1.1). The compounds most frequently involved in the poisoning of adults and children are listed in Tables 1.2 and 1.3, respectively. Among the adults, intentional intoxication is predominant, whereas it is accidental poisoning in case of small children. Inhalant abuse is most popular among the young. In rural areas, poisoning from organophosphorus pesticides and nicotine is occurring frequently, but not in urban environments.

Germany: As in the United States, alcoholic beverages and tobacco are predominantly abused [1]. Forty thousand deaths per year are attributed to ethanol and 143 300 deaths/year to tobacco (including 3300 death due to passive smoking), if deaths consequential to chronic abuse are included (total population 82 million). The number of drug deaths touched 1394 in the year 2007 including deaths from accidents under the influence of drugs. First-time drug abusers (total 18620) administered the following drugs: amphetamine/methamphetamine (53%), cocaine (20%), ecstasy (11%), heroin (22%), crack (free base of cocaine) (3%) and LSD (1%). Psilocybin containing mushrooms or khat (which is popular in Eastern Africa) did not play a significant role.

Impact of clinical toxicological analysis

Clinical symptoms are usually not unambiguous and may be caused not only by poisoning (Table 11.5) but also by many other diseases. In a study, the clinical diagnosis of poisoning was fully correct only in 22% of the patients. For 36% of the patients, the clinical diagnosis was partly correct and further relevant toxic

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Table 1.1 Categories with largest numbers of deaths (United States, 1999).

Substance(s)	Deaths per year
Carbon monoxide	>5000
Analgesics	340
Antidepressants	153
Cardiovascular drugs	127
Stimulants and street drugs	121
Sedative-hypnotics	110
Alcohols	97
Gases and fumes	45
Chemicals	43
Antihistamines	28
Muscle relaxants	18
Automotive products	15
Pesticides and insecticides	15
Anticonvulsants	14
Hormone and hormone antagonists	13
Cleaning substances	13

Adapted from Ref. [2].

compounds were detected by the toxicological analysis. In 42% of the patients, the clinical diagnosis was completely incorrect: Other poisons than assumed from the clinical symptoms were detected (12%), suspected suspicion could be disproved (14%), or poisoning was detected although not suspected by the physicians (16%). The results are not surprising, if one considers, besides the ambiguity of clinical

Table 1.2 Top 15 categories most frequently involved in adult (>19 years old) exposures (United States, 1999).

Category	Cases per year
Analgesics	74 602
Cleaning substances	64 691
Bites and envenomations	52 349
Sedative-hypnotics	50 311
Antidepressants	42 983
Food poisonings	36 924
Cosmetics and personal care preparations	30 029
Chemicals	29 441
Alcohols	28 020
Hydrocarbons	25 676
Fumes, gases, and vapors	25 056
Pesticides and insecticides	24 510
Cardiovascular drugs	22 947
Plants	16 764
Cough and cold preparations	15 868

Adapted from Ref. [2].

Table 1.3 Top 10 categories most frequently involved in pediatric (<6 years old) exposures (United States, 1999).

Category	Cases per year
Cosmetics and personal care preparations	153 057
Cleaning substances	123 575
Analgesics	87 471
Plants	79 287
Foreign bodies	76 268
Topical agents	65 561
Cough and cold preparations	63 951
Pesticides and insecticides	43 107
Vitamins	38 651
Gastrointestinal preparations	36 597

Adapted from Ref. [2].

symptoms, that often several drugs are administered simultaneously and very often ethanol is involved in addition and therefore diverging influences are superimposed or overruled.

Henceforth toxicological analysis is mandatory to prove poisoning if suspected from clinical symptoms. Unfortunately, it is not feasible to exclude poisoning whenever clinical symptoms are present, which might be caused by a toxic agent. The strategies described in Chapter 11 assist in detecting most often relevant acute intoxications even though not suspected by the clinician at reasonable expenditures.

References

1 Drogen- und Suchtbericht (2008) der Bundesregierung Deutschland (Report on drugs and addiction (2008) of the Federal Government of Germany).

2 Litovitz, T.L., Klein-Schwartz, W., White, S., Cobaugh, D.J., Youniss, J., Drab, A. and Benson, B.E. (2000) 1999 Annual Report of the American Association of Poison Control Centers Toxic Exposure Surveillance System. *American Journal of Emergency Medicine*, **18**, 517–574.