IATROGENIC INTRAVENOUS ADMINISTRATION ERRORS REPORTED TO THE PIC ERFURT

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Objective

We investigated the incidence of iatrogenic intravenous administration errors of drugs reported to the Poisons Information Centre Erfurt to get further information for effective prevention.

Method

Calls regarding iatrogenic intravenous medication errors received by the poison centre from 1997 to the end of October 2006 were analysed retrospectively. Data were categorised into error types, age groups, drugs involved, and estimated risk of toxicity.

Medication Errors

Intravenous administration errors from 1997 to 2006

128 cases of intravenous administration errors of drugs were advised by the PIC. Intravenous administration errors increased from 7 in 1997 to 18 in 2005. In 2006 27 inquiries were received until the end of October (Fig. 1).

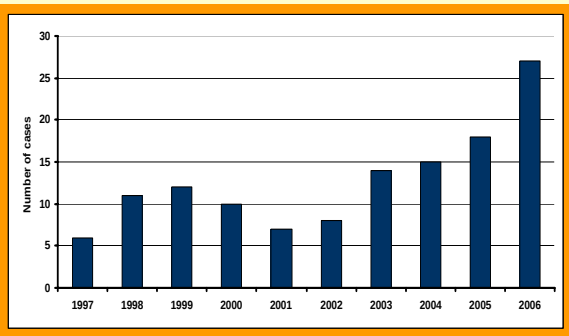

Figure 1: intravenous administration errors (1997 to 2006)

Patients

Patients affected were 31% children (75% of them babies and toddlers) and 69% adults. Among adults 32% were in the mean age group (18 to 65 years old); 19% were seniors, but in 49% the age remained unknown (Fig.2).

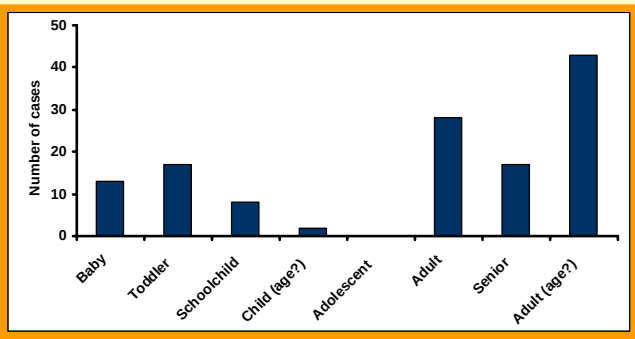

Figure 2: Age of patients affected by medication error

Drugs involved in medication errors

Most frequent drug classes (ATC classification) involved were antipsychotics (10%), antihistamines for systemic use (7.8%), antimetabolites, direct acting antivirals as well as other systemic drugs for obstructive airway diseases (5.4% for each class), other analgesics and antipyretics (4.7%), antiseptics and disinfectants and local anaesthetics (both 3.8%), macrolides, lincosamides and streptogramines, antithrombotic agents, antiepileptics, and adrenergics for systemic use (3% for each class).

ATC Code	Drug class	Number of medication errors					
		total	Preparation error	Dosing error	incorrect route of application	Mix-up of patients' medication	paravenous injection
N05A	antipsychotics	13		4	9		
R06A	antihistamines for systemic use	10		2	8		
L01B	antimetabolites	7		4		1	2
J05A	direct acting antivirals	7		7			
R03D	other systemic drugs for obstructive airway diseases	7		5	2		
N02B	other analgetics antipyretics	6		5	1		
D08A	antiseptics and disinfectants	5	1	2	1	1	
N01B	local anaesthetics	5		1	3	1	

Type of medication error

The main types of errors were overdosage (53.1%) and wrong route of application (29.7%). Other medication errors were mixing up the medication of patients (7.2%), preparation errors (6.3%), and paravenous injection (3.9%) (Fig. 3).

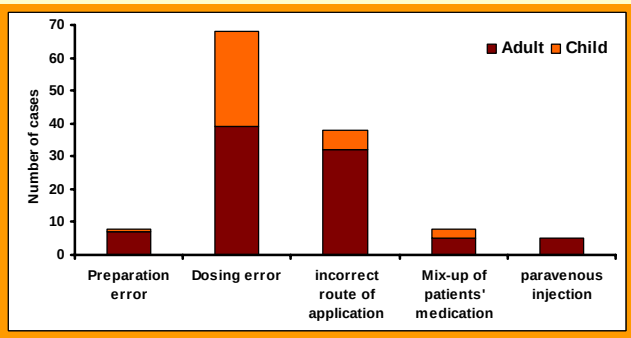

Figure 3: Most frequent types of medication error

Estimated risk of toxicity

Estimated risk: 14.1% no risk, 71.8% risk of toxicity (12.5% severe), 14.1% unpredictable risk. Medical treatment was recommended in 82%. Courses: asymptomatic (5.4%), symptomatic (10.9%) with minor (9 cases), moderate (1 case), and severe features (4 cases) but complete recovery. (Fig. 4). In one case sudden cardiac arrest was reported followed by hypoxia-induced brain damage despite of resuscitation. In another patient the erroneous intravenous application resulted in sudden cardiac arrest and death despite of immediate resuscitation. Unfortunately, the follow-up was impossible in most cases (82%) (Fig. 4).

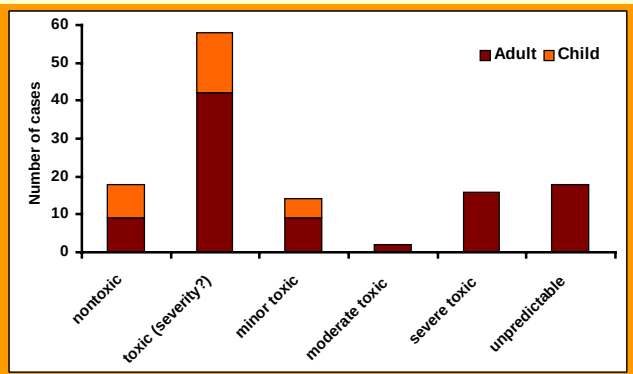

Figure 4: Estimated risk of toxicity caused by medication error

Conclusion

One per mill of all calls received concerned iatrogenic intravenous administration errors of drugs. At least 4% of these administration errors resulted in severe symptoms. Overdosage and wrong route of application as the most frequent errors may be avoidable by training of the medical staff and clear distinguishable packing of preparations with different potencies or different application forms.