ESCP, Edinburgh, 16-19 May 2007

EVALUATION OF PHYSICOCHEMICAL COMPATIBILITIES DURING INTRAVENOUS DRUG ADMINISTRATION IN TWO PAEDIATRIC INPATIENT AND OUTPATIENT ONCOLOGY UNITS

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BACKGROUND

Chemotherapeutic agents and other intravenous (iv) drugs are often administered to paediatric oncology patients through a unique implantable vascular access port. Drug administration and compatibility charts are available in the paediatric oncology units of our hospital.

OBJECTIVES

The aim of this study was to identify the iv drug associations used in children and adolescents and to determine if the drugs were injected or infused according to known compatibility data.

METHODS

Design: Anonymous observational prospective study during a 6-month period. Cytotoxic drugs were prepared by the pharmacy. For each patient, all iv drugs were recorded, as well as drug concentration, solute, administration rate and mode of administration. Nurses were also interviewed by the pharmacist. Data were compared with published data [1-3].

Setting: Two paediatric inpatient and outpatient oncology units of a university hospital.

Main Outcome Measures: Compatibilities between drugs administered through the same iv line: drug-drug and drug-solute associations in the same infusion (mixture) and through Y-site.

RESULTS

Fig. 1 : Intravenous drug administration in the paediatric oncology units

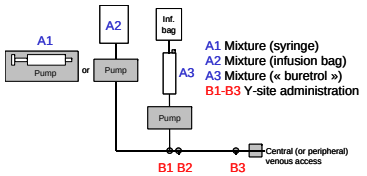

Table 1 : Number of patients and observations

	No. of patients	No. of observations
Inpatients	20	30
Outpatients	20	22
Total	*40*	*52*

Age – yr (median and range):	7,1 (0,8-21,5)
Drugs per patient – no. (mean and range):	4,3 (2-9)

Table 2 : Number of cytotoxic drugs administered to inpatients (N = 30 obs.) and outpatients (N = 22 obs.)

	Inpatients	Outpatients	Total
Vincristine	10	15	25
Methotrexate	10	2	12
Carboplatin	3	4	7
Cytarabine	6	0	6
Doxorubicin	4	1	5
Etoposide	4	1	5
Cyclophosphamide	3	1	4
Daunorubicin	2	1	3
Ifosfamide	3	0	3
Dactinomycin	2	0	2
Cisplatin	2	0	2
Cladribine	2	0	2
Topotecan	2	0	2
Idarubicin	1	0	1
Irinotecan	0	1	1
Mitoxantrone	1	0	1
Oxaliplatin	0	1	1
Tiothepa	1	0	1
Vindesine	1	0	1
Vinorelbine	1	0	1
Total	*58*	*27*	*85*

Table 3 : Number of other drugs and solutes administered to inpatients and outpatients

a) 10 of 25 other intravenous drugs

	Inpatients	Outpatients	Total
Ondansetron	28	20	48
Sodium bicarbonate	19	0	19
Mesna	9	2	11
Morphine	3	7	10
Midazolam	1	7	8
Potassium chloride	8	0	8
Dexamethasone	4	3	7
Furosemide	4	0	4
Paracetamol	3	0	3
Alizapride	2	0	2

b) Solutes

0,9% sodium chloride (n=150), glucosaline (n=41), 5% glucose (n=24), others (n=5)

Table 4 : Drug-drug and drug-solute associations in the same infusions (mixtures)

		Inpatients	Outpatients	*Total*
Drug-drug associations	Compatible	10	1	*11*
	Incompatible	0	0	*0*
	No data	1	0	*1*
	Total	*11*	*1*	*12*

		Inpatients	Outpatients	*Total*
Drug-solute associations	Compatible	138	69	*207*
	Incompatible	0	0	*0*
	No data	0	0	*0*
	Total	*138*	*69*	*207*

Table 5 : Drug-drug and drug-solute associations through Y-site

		Inpatients	Outpatients	*Total*
Drug-drug associations	Compatible	13	0	*13*
	Incompatible	0	0	*0*
	No data	6	0	*6*
	Total	*19*	*0*	*19*

		Inpatients	Outpatients	*Total*
Drug-solute associations	Compatible	29	0	*29*
	Incompatible	0	0	*0*
	No data	0	0	*0*
	Total	*29*	*0*	*29*

Table 6 : Examples of drugs administered through Y-site with no information regarding compatibilities

$NaHCO_3$ - $KHPO_4$
Cisplatine – hydration infusion (with K, Ca, Mg)
Mesna - doxorubicin

CONCLUSION

This study showed that:

1) **Only few drugs were administered simultaneously through the same iv line in inpatients; multiple iv cytotoxics were mostly injected or infused sequentially.**
2) **No drugs were injected or infused simultaneously through Y-site in outpatients.**
3) **Even if a doubt remained on drug associations with no compatibility data, the problem of drug incompatibilities could be mostly avoided with the planning of infusions during prescription and the respect of good nursing practice (by stopping the infusions and flushing the lines with a saline between injection, if compatible).**

REFERENCES [1] Compendium Suisse des Médicaments. Bâle : Documed. 2006. [2] Trissel LA. Handbook on Injectable Drugs. 12th ed. Bethesda : ASHP. 2003. [3] King JC et al. Guide to parenteral admixtures. St-Louis : Hudnell. 2004-6.

ACKNOWLEDGEMENTS The authors wish to thank the nurses of the Paediatric Oncology Units of our hospital.

CONFLICTS OF INTEREST None.

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