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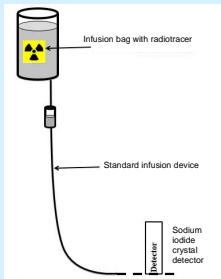
INTRODUCTION / OBJECTIVES

Since several years, many infusion systems intended to secure the administration of antineoplastic drugs (AD) have been marketed.

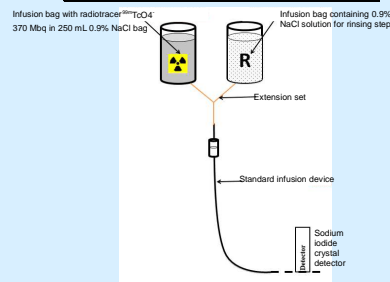
The aim of this study was to compare the ability of these infusion devices to deliver the expected volume of antineoplastic drug in solution.

MATERIAL AND METHODS

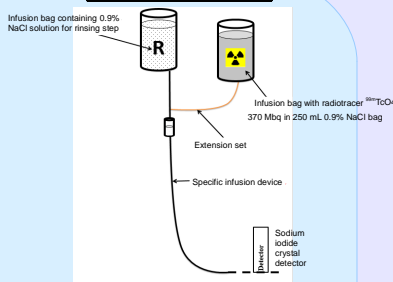
STANDARD DEVICE



EXTENSION LINE + STANDARD INFUSION DEVICE



SPECIFIC INFUSION DEVICE

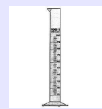
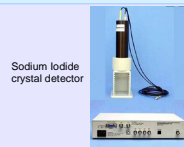


Infusion set or device	Supplier	Dead-space volume (mL)
KIS 1	Doran International®	15.8 ± 0.1

Infusion set or device	Supplier	Dead-space volume (mL)
MFX2307 + KIS 1	Carefusion®	18.4 ± 0.2
PCHIMX + KIS 1	Doran International®	17.8 ± 0.1
PCHIMX + MS60	Fresenius®	24.7 ± 0.9

Infusion set or device	Supplier	Dead-space volume (mL)
Cyto-Ad set	Codan®	33.0 ± 0.4
MFX2309	Carefusion®	18.6 ± 0.2
Tevatrae 2	Teva®	17.5 ± 0.2
Tevatrae 4	Teva®	17.9 ± 0.2
Chemoset	ICUMedical®	17.7 ± 0.3

Simulated infusion comparing nine different infusion circuits



- Decay correction of radioactivity
- AUC computation with linear trapezoidal rule
- Volume from the rinsing bag needed to get no more radioactivity

Measured parameters

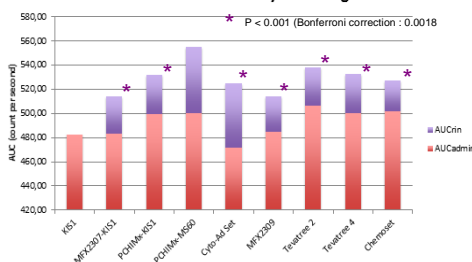
- Area under curve of activity according to time during the administration (AUCadm)
- Area under curve of activity according to time during the rinsing step (AUCrin)
- Rinsing volume

Continuous recording of the activity at the egress of the infusion system

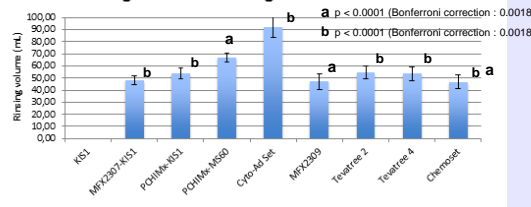
Values comparison using a Kruskal-Wallis test (p<0.05)

RESULTS

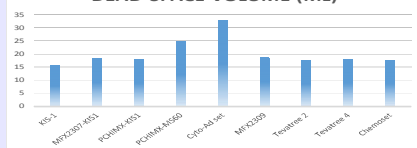
Areas under curve of activity according to time



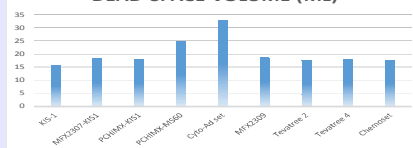
Rinsing volume according to infusion device



DEAD-SPACE VOLUME (ML)



DEAD-SPACE VOLUME (ML)



Despite the differences in dead-space volume, AUCadm were not significantly different between the devices. Using a simple infusion device leads to deprive patients from at least 6% of their dose (varying between devices).

The rinsing volumes were significantly different between all tested devices, ranging between 46.8 ± 5.7mL (Chemoset) and 92.2 ± 8.9mL (Cyto-Ad set).

DISCUSSION / CONCLUSION

The rinsing conditions to administer the same dose are really different from a device to another. The impact of good handling practices of these devices has to be assessed on the pharmacokinetic parameters. Our study shows that the drug concentration (the diluent volume) and the infusion device must be taken into account in routine clinical practice to infuse antineoplastic drugs as well as other injectable drugs. Because the use of these devices may alter the handling procedures of healthcare workers, nurses education to the handling of these specific devices is of utmost importance to control the rinsing step in the aim to avoid pharmacokinetic trouble by splitting the drug administration in two distinct phases.