Ability of infusion devices to deliver the expected volume of antineoplastic drug in solution: an in vitro assessment

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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

Simulated infusion comparing nine different infusion circuits

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

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

RESULTS

Despite the differences in dead-space volume, AUCAadm 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 ± 6.9mL (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 wells 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.