The automated compounding of paclitaxel albumin as a sustainable alternative to the traditional compounding

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BACKGROUND AND PURPOSE

Paclitaxel albumin is indicated for the treatment of metastatic carcinoma of the breast after failure of anthracycline treatment. It is a notoriously delicate drug to handle because the suspension has a high tendency to foam. According to the information sheet, the drug reconstitution requires particular attention during solvent injection.

Furthermore, the vial needs to stand for 5 and 15 minutes before and after shaking, to reduce the foam. As a consequence, preparing the treatment appears laborious and demanding for technicians.
The purpose of this study is to automate the preparation of Abraxane® with APOTECAchemo and analyze the results.
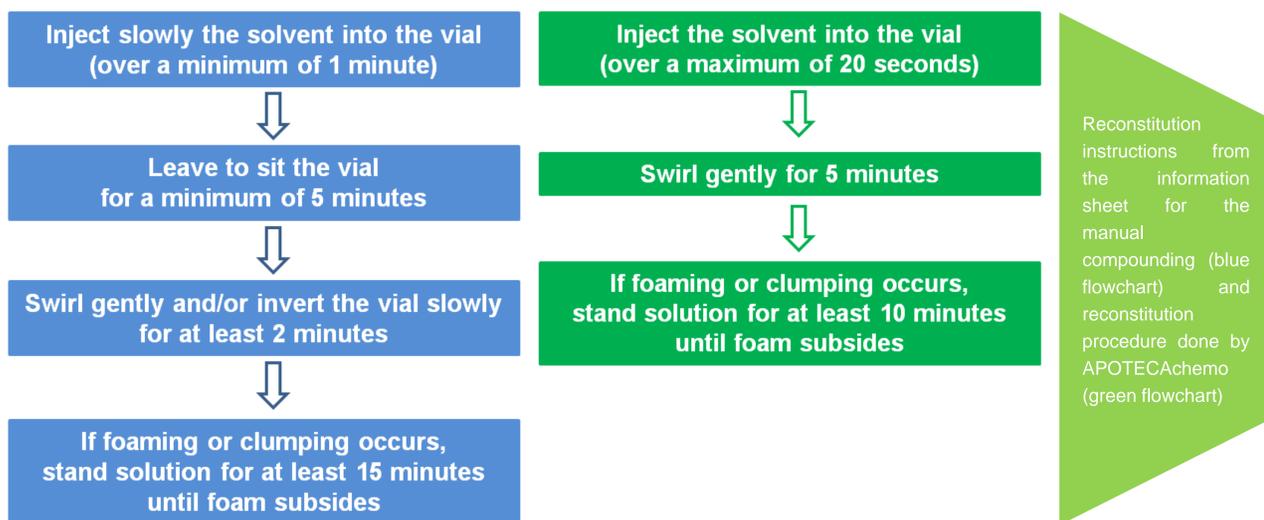

Foam appearence after reconstitution

Abraxane® withdrawal after reconstitution

MATERIAL AND METHOD

Inject slowly the solvent into the vial (over a minimum of 1 minute)
⬇
Leave to sit the vial for a minimum of 5 minutes
⬇
Swirl gently and/or invert the vial slowly for at least 2 minutes
⬇
If foaming or clumping occurs, stand solution for at least 15 minutes until foam subsides

Inject the solvent into the vial (over a maximum of 20 seconds)
⬇
Swirl gently for 5 minutes
⬇
If foaming or clumping occurs, stand solution for at least 10 minutes until foam subsides

Reconstitution instructions from the information sheet for the manual compounding (blue flowchart) and reconstitution procedure done by APOTECAchemo (green flowchart)

The manual procedure was examined in detail to evaluate the feasibility of automating the compounding of Abraxane.
10 doses are compounded manually, according to the data sheet. Next, 10 preparations of Abraxane were carried out with APOTECAchemo, following the standard procedure. However, the vials were left to rest for 10 minutes after reconstitution, before going on with the preparation. The prepared doses were analysed in terms of dosage accuracy and compounding time.

Automatic compounding of Abraxane®:
a) Vials reconstitution
b) Visual check of reconstitution
c) Drug withdrawal after reconstitution
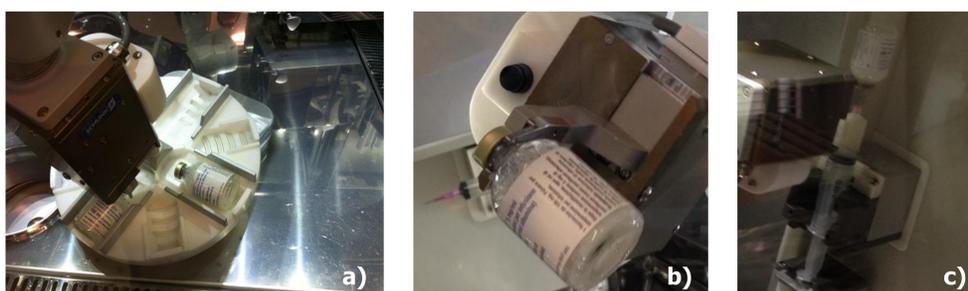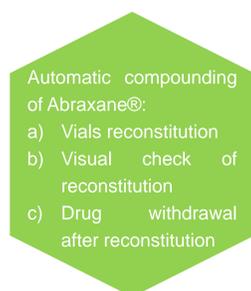
RESULTS

The preparations compounded manually showed an average dosage of 1.5% higher than the prescribed and a compounding time of 30 minutes. The dosage of preparations done automatically was 0.5% less than expected. The total compounding time resulted in 22 minutes for preparation: 7 minutes for reconstitution of 2 vials, 10 minutes for vial standing and 5 minutes for compounding. The 10-minute rest time was enough to significantly reduce the foam. Dosage accuracy of the automatic procedure produced a similar or better result than the manual compounding. Finally, the use of APOTECAchemo reduced the compounding time by a significant 26%.
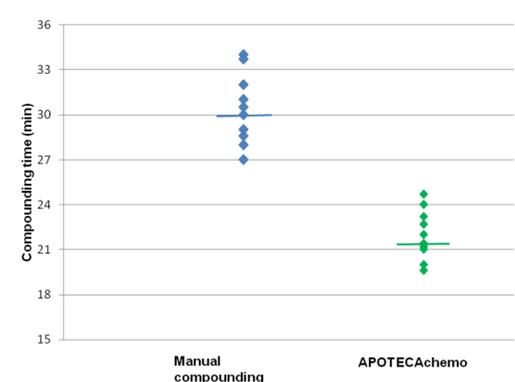
Compounding time of Abraxane® doses prepared manually and automatically

CONCLUSION

The automation of Abraxane preparation was found to be feasible and sustainable. The dosage accuracy of APOTECAchemo resulted comparable with the manual method. Because of the shorter compounding time required to reduce the foam, automatic preparation represents an easy and convenient alternative to the traditional practice.

	Preparations - dosage accuracy (%)										Average (%)	Dev.St (%)
	1	2	3	4	5	6	7	8	9	10		
Manual compounding	2,07	-0,21	2,17	1,17	-0,3	1,5	2,1	2,19	2,2	1,71	1,5	1,0
APOTECAchemo	-0,95	0,54	-0,11	-0,59	-0,73	0,58	-0,47	-1,47	-0,66	-1,1	-0,5	0,7

Dosage accuracy of Abraxane® preparared by manual and automatic compounding.

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