STABILITY OF OPHTHALMIC INJECTIONS OF CEFTAZIDIME, VANCOMYCIN AND DEXAMETHASONE IN AQUEOUS HUMOR AFTER FREEZING, STORAGE AND THAWING

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Background

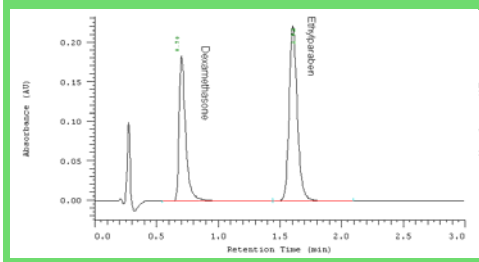
Sterile ophthalmic injections with two antibiotics and one glucocorticoid are used at the Geneva university hospitals in case of infectious complications during intraocular surgeries. Until recently, the pharmacy was receiving these prescriptions as emergency requests. The preparation of series of 1 mL sterile syringes of each drug to be frozen and then stocked in the Ophthalmology ward was investigated.

Methods

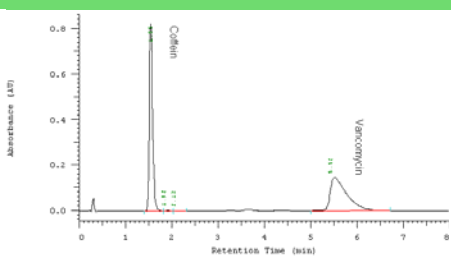
A stability study of the three substances has been developed over a 6-month period. One-hundred-thirty 1 mL sterile syringes of each substance in aqueous humor were prepared in aseptic conditions and frozen at –18 °C. Samples were thawed at room temperature each 15th day during the first 3 months and each 30th day during the last 3 months. The concentrations were measured by stability indicating HPLC methods and both pH and osmolarity measurements were performed. Sterility and endotoxin tests were also achieved.

HPLC parameters

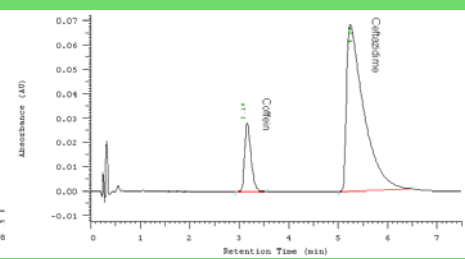
Instrument:	Merck Hitachi LaChrom with high pressure pump 7100 UV-DAD detector L-7455	**Injection volume:**	20 µL
		Flow rate:	1.2 mL/min
Column:	Supelcosil LC-18, 50mm×3mm, 3µm dp	**UV detection:**	Detection UV: 296 nm (cefta), 220 nm (vanco), 254 nm (dexa)
Mobile phase:	Phosphate buffer pH 2.5 – Acetonitrile (95:5 cefta, 93:7 vanco; 75:25 dexa)		



Dexamethasone syringe after 6 months at -18°C



Vancomycin syringe after 6 months at -18°C



Ceftazidime syringe after 6 months at -18°C

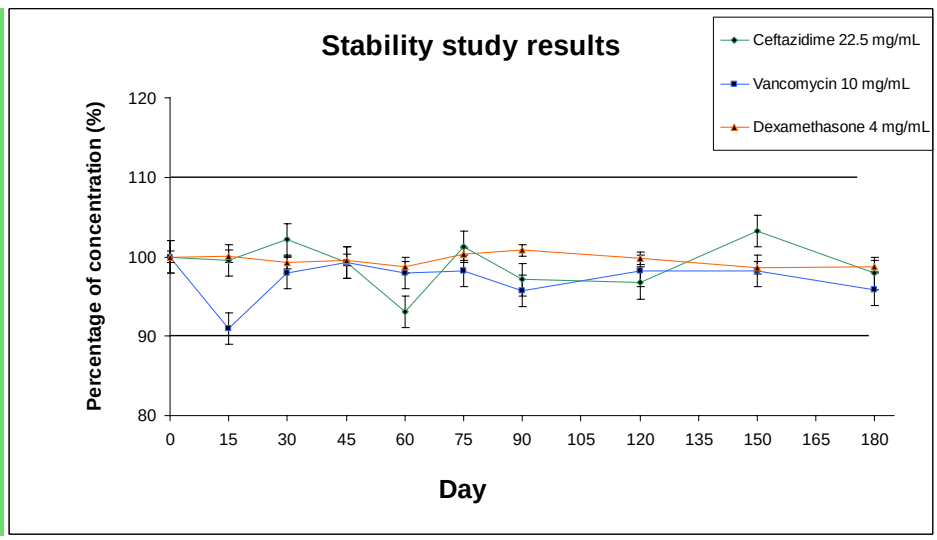
Results

The analytes concentrations were stable for six months (at least 90% of the initial concentration). The pH obtained were [6.5-7.1], [6.0–6.1], [8.5–8.9] and the osmolarities were [316–346], [200–216], [360–393] mOsm/kg for ceftazidime, vancomycin and dexamethasone, respectively. These intervals are compatible with intravitreous administration. All the syringes were sterile during the study and no endotoxin presence was revealed.
The airtightness of the syringes was tested with a Methylene-blue 1% solution after freezing, storage and thawing and were conform.

Sterile Syringes

Syringes packed in sterile bags

Final packages in plastic light protection



Conclusion

Frozen ophthalmic injections of the three substances are stable for 6 months, so they can be prepared in advance, frozen and thawed at room temperature just before their use. This improves drug availability, the organisation of the production unit, the safety of the preparation and time management.

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Conflict of interest : nothing to disclose