27th EAHP CONGRESS 22-23-24 MARCH 2023 Lisbon

STABILITY OF TACROLIMUS ORAL SUSPENSION IN DISPOSABLE POLYPROPYLENE SYRINGE

Hernández Ramos JA[1], Pablos Bravo S[1], Rolo M[2], Bruni Montero MA[1], González Gómez Á[1], Castro Frontiñán A[1], Ferrari Piquero JM[1]

[1]Servicio de Farmacia – Hospital Universitario 12 de Octubre, 28041 Madrid (Spain)
[2]Servicio de Microbiología y Parasitología – Hospital Universitario 12 de Octubre, 28041 Madrid (Spain)
Contact data (first author): jhernandezr@salud.madrid.org

BACKGROUND AND IMPORTANCE

Following solid organ transplantation, **post-anaesthesia care units prioritise tacrolimus administration by enteral route** to minimise the neurotoxicity associated with its use via continuous intravenous infusion.

There is no currently tacrolimus liquid dosage form commercially available ready for direct administration *per os* or via feeding tube.

AIM AND OBJECTIVES

Design an affordable and ready-to-use extemporaneous tacrolimus oral solution/suspension

→

Validate its physical, chemical and microbiological stability in polypropylene syringe

→

Limit nurses exposure to this hazardous drug

MATERIAL AND METHODS

❶ Design of an appropriate formulation

Search & evaluation of tacrolimus' physicochemical properties

Selection of pharmaceutical form and suitable excipients

Preparation and storage: 20 – 25 ºC; 2 – 8 ºC

❷ Assessment of stability parameters

Every 7 days for a 28-days period, performed in triplicate

TESTS	Physico-chemical	Organoleptic properties, sedimentation time, homogeneity, pH, redispersibility, crystal growth and weight variation
	Micro-biological	Colony-forming units (CFU) growth: Blood agar cultures read after 24 and 48 h Sabouraud cultures read after 24, 48, 72 and 96 h

RESULTS

Tacrolimus 1 mg/mL oral suspensions

Formulation A: Oraplus® + Orasweet® (1:1 ratio)

Formulation B: Simple syrup + 1,5 % CMC aqueous gel (2:1 ratio)

Formulation B underwent validation →

Formulation B contains less excipients and is more affordable (8,51 € cheaper per 100 mL)

	Stored at 20 – 25 ºC	Stored at 2 – 8 ºC
Organoleptic properties	Sheer with yellowish hue and sweet	
Homogeneity	Homogeneous	
Sedimentation time	Sediment not detected	
Redispersibility		
Crystal growth	Crystals not detected	
pH	5,70 (5,60 – 5,76)	5,72 (5,70 – 5,76)
Weight variation	0,96% (0,38 – 1,65%)	0,75% (0,58 – 1,08%)

Only one *Staphylococcus hominis* CFU was detected on day 14 in one sample stored at 2 – 8 ºC. No subsequent microbial growth was found → considered contamination.

CONCLUSION AND RELEVANCE

Tacrolimus 1 mg/mL oral suspension in simple syrup and carboxymethylcellulose 1,5% aqueous gel in a 2:1 ratio is stable when conditioned in polyproplylene syringe for 28 days and stored at room or refrigerator temperature.

The developed and validated formulation provides safer handling of tacrolimus for nurses when a liquid oral dosage form is needed.

QR CODE

Download this poster and share it!