



DEVELOPMENT OF AN ORAL KETAMINE COMPOUNDING AND CREATION OF A PHARMACEUTICAL CARE CIRCUIT FOR PHANTOM LIMB SYNDROME

CORAZON VILLANUEVA,J; PUEBLA GARCIA, V; SANCHEZ-OCAÑA MARTIN,N; YBAÑEZ GARCIA,L;DE LA TORRE ORTIZ,M; PASTOR VARA,P;FERNANDEZ-VAZQUEZ CRESPO,M;MARTINEZ SESMERO,JM.
Servicio de Farmacia. Hospital Clínico San Carlos (Madrid)

1. WHAT WAS IT DONE?

Development and validation of an oral ketamine compound and a specific pharmaceutical care circuit (PCC) as a part of the treatment of phantom limb syndrome (PLS).

2. WHY WAS IT DONE?

The PLS is the perception of a non-existent limb that may occur in up to 80% of amputees. The management is complex, The absence of a marketed formulation, off-label use of drugs and the complex treatment of pain make the role of the pharmacist essential.

3. HOW WAS IT DONE?

✓ **Literature research** was carried out on the preparation of this compounding, as well as on the use of oral ketamine (bioavailability, dosage, adverse reactions...).



✓ **Compounding:** oral solution of 10mg/ml was prepared (final volume 50ml: 500mg of injectable ketamine solution or raw material, 20ml of simple syrup with a sufficient amount of purified water and 2 drops of lemon essence).

To establish the expiration date recommendations of Good Manufacturing Practice Guideline were followed and the organoleptic characteristics were evaluated for quality control.



✓ **Pharmaceutical care circuit:**

- Setting up a first presential visit to provide pharmaceutical care during admission: to inform the storage conditions, most common adverse effects and recommendations about medication intake.
- Initially appointments every 7 days for a closer follow-up: control of adverse reactions (confusion, agitation, nausea, etc.), monitoring of the appropriate use of ketamine and other analgesic medication (avoiding possible abuse and addictive behaviour) and pain control. Pharmaceutical interventions are communicated to the pain management unit (PMU).
- Spacing of visits fortnightly once the treatment is well-stablished and proposing a telepharmacy service.



4. WHAT HAS BEEN ACHIEVED?

The ketamine formulation developed has been used in our hospital in three patients with satisfactory results. The **interventions** carried out were: pain control problems, possible inappropriate use, reduction in the number or dosage of concomitant medication or ketamine itself.

5. WHAT NEXT?

The capacity to provide therapeutic alternatives and a more exhaustive pharmacological control of pain in collaboration with the PMU can **improve the safety and effectiveness of these treatments**.

