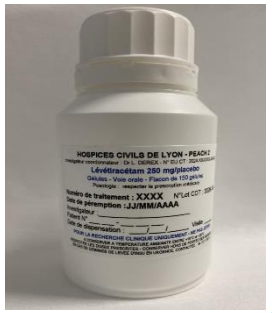
Development of an experimental drug and implementation of its preparation on automatic capsule fillers

Samia Meziani[1], Chloe Marchand[1], Camille Merienne[1], Carole Dhelens[2], Fabrice Pirot[1].
[1] Unité de Préparation et de Contrôle des Médicaments, plateforme FRIPHARM, Pharmacie à usage intérieur, Groupement Hospitalier Edouard Herriot - Hospices Civils de Lyon
[2] Unité pharmaceutique Essais cliniques, plateforme FRIPHARM, Pharmacie à usage intérieur, Groupement Hospitalier Edouard Herriot - Hospices Civils de Lyon

COM24-41942

CONTEXT AND OBJECTIVES

The pharmacy was asked to prepare and control 250 mg levetiracetam capsules.
The purpose was to evaluate, in a double-blind clinical trial, the efficacy of prophylactic antiepileptic treatment in the acute phase of intracerebral hemorrhage.
The aim was to examine the feasibility of filling levetiracetam capsules without excipients, using an automatic capsule filler.



MATERIALS AND METHODS

In order to assess the feasibility of automatic capsule filling using an automatic capsule filler, an analysis of the particle size distribution of levetiracetam was determined by analytical sieving (European Pharmacopoeia tests 2.9.38) using a powdered sample of levetiracetam sieved for 15 minutes.

A microscopic observation (magnification x100) was carried out on the various powdery fractions of levetiracetam retained on each of the sieves.

Once the particle size analysis had been completed, the capsules were filled with levetiracetam powder using an automatic capsule filler at a rate of 3,000 capsules/hour. Capsule mass uniformity (Eur.Phr 2.9.5) was checked on a sample of 20 capsules randomly taken during production.

RESULTS

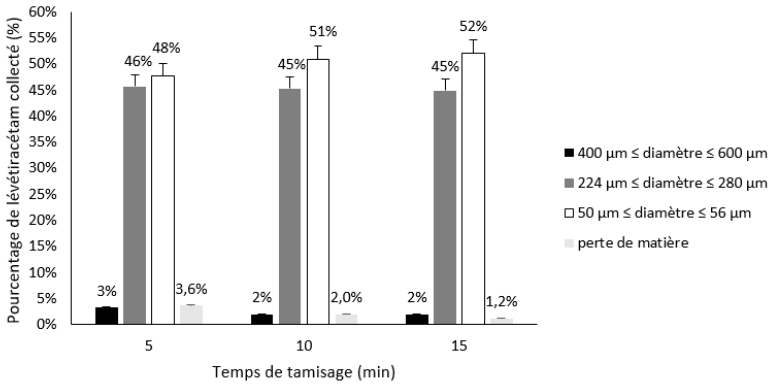


Figure 1: Particle size distribution of levetiracetam as a function of sieving time and sieve mesh diameter.

The particle size distribution of levetiracetam determined by sieving (total loss of material < 5%) and microscopic observation ranged from 50 µm - 56 µm (52%) to 224 µm - 280 µm (45%). Capsule mass uniformity after filling complied with European Pharmacopoeia specifications (error ≤ 10%).

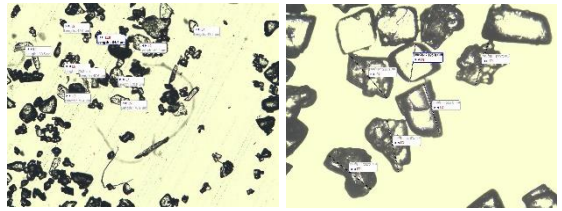


Figure 2 : Microscopic observation (x100 magnification) of powdery fractions of levetiracetam.

DISCUSSION AND CONCLUSION

In this study, a levetiracetam particle size between 50 µm and 200 µm was chosen to ensure optimal flow and uniform filling of capsules using an automatic capsule filler. The simplicity of automated production ensures homogeneous distribution of the active ingredient in each capsule, guaranteeing precise dosage and optimum therapeutic efficacy.