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Draft Guidance on Hydrochlorothiazide; Metoprolol Succinate

August 2024

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Active Ingredients:	Hydrochlorothiazide; Metoprolol succinate
Dosage Form:	Tablet, extended release
Route:	Oral
Strengths:	12.5 mg; EQ 25 mg Tartrate, 12.5 mg; EQ 50 mg Tartrate, 12.5 mg; EQ 100 mg Tartrate
Recommended Studies:	Two in vivo bioequivalence studies with pharmacokinetic endpoints

1. Type of study: Fasting
Design: Single-dose, two-treatment, two-period crossover in vivo
Strength: 12.5 mg; EQ 100 mg Tartrate
Subjects: Healthy males and non-pregnant, non-lactating females
Additional comments: None
2. Type of study: Fed
Design: Single-dose, two-treatment, two-period crossover in vivo
Strength: 12.5 mg; EQ 100 mg Tartrate
Subjects: Healthy males and non-pregnant, non-lactating females
Additional comments: None

Analytes to measure: Hydrochlorothiazide and metoprolol in plasma

Bioequivalence based on (90% CI): Hydrochlorothiazide and metoprolol

Additional strengths: Bioequivalence of the 12.5 mg; EQ 25 mg Tartrate and 12.5 mg; EQ 50 mg Tartrate strengths to the corresponding reference product strengths may be demonstrated based on principles laid out in the most recent version of the FDA guidance for industry on *Bioequivalence Studies with Pharmacokinetic Endpoints for Drugs Submitted Under an ANDA*.^a

Dissolution test method and sampling times: For modified release drug products, FDA recommends that applicants develop specific discriminating dissolution methods. Alternatively, applicants may use the dissolution method set forth in any related official United States Pharmacopeia (USP) drug product monograph, or in the FDA's database (available at <http://www.accessdata.fda.gov/scripts/cder/dissolution/>), provided that applicants submit adequate dissolution data supporting the discriminating ability of such a method. If a new dissolution method is developed submit the dissolution method development and validation report with the complete information/data supporting the proposed method. Conduct comparative dissolution testing on 12 dosage units for each strength of the test and reference products. Specifications will be determined upon review of the abbreviated new drug application.

In addition to the method above, submit dissolution profiles on 12 dosage units for each strength of the test and reference products generated using USP Apparatus I at 100 rpm and/or Apparatus II at 50 rpm in at least three dissolution media (e.g., pH 1.2, 4.5, and 6.8 buffer). Agitation speeds may be increased if appropriate. It is acceptable to add a small amount of surfactant, if necessary. Include early sampling times of 1, 2, and 4 hours and continue every 2 hours until at least 80% of the drug is released to provide assurance against premature release of drug (dose dumping) from the formulation.

Alcohol dose dumping studies: Due to concerns of dose dumping of drug from this product when taken with alcohol, conduct additional dissolution testing on all strengths using various concentrations of ethanol in the dissolution medium as follows:

Testing conditions: 900 mL, 0.1N HCl, USP Apparatus 2 (paddle) at 50 rpm, with or without alcohol

Test 1: 12 units tested according to the proposed method (with 0.1 N HCl) with data collected every 15 minutes for a total of 2 hours

Test 2: 12 units analyzed by substituting 5% (v/v) of test medium with Alcohol USP and data collection every 15 minutes for a total of 2 hours

Test 3: 12 units analyzed by substituting 20% (v/v) of test medium with Alcohol USP and data collection every 15 minutes for a total of 2 hours

Test 4: 12 units analyzed by substituting 40% (v/v) of test medium with Alcohol USP and data collection every 15 minutes for a total of 2 hours

Conduct testing on both test and reference products accordingly, and provide data on individual unit, means, range and %CV.

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^a For the most recent version of a guidance, check the FDA guidance website at <https://www.fda.gov/regulatory-information/search-fda-guidance-documents>.