CBG MEB

PUBLIC ASSESSMENT REPORT of the Medicines Evaluation Board in the Netherlands

Letromedica 2.5 mg film-coated tablets Regiomedica GmbH, Germany

letrozole

This assessment report is published by the MEB pursuant Article 21 (3) and (4) of Directive 2001/83/EC. The report comments on the registration dossier that was submitted to the MEB and its fellow –organisations in all concerned EU member states.
It reflects the scientific conclusion reached by the MEB and all concerned member states at the end of the evaluation process and provides a summary of the grounds for approval of a marketing authorisation.
This report is intended for all those involved with the safe and proper use of the medicinal product, i.e. healthcare professionals, patients and their family and carers. Some knowledge of medicines and diseases is expected of the latter category as the language in this report may be difficult for laymen to understand.

This assessment report shall be updated by a following addendum whenever new information becomes available.

General information on the Public Assessment Reports can be found on the website of the MEB.

To the best of the MEB's knowledge, this report does not contain any information that should not have been made available to the public. The MAH has checked this report for the absence of any confidential information.

EU-procedure number: NL/H/1672/001/DC
Registration number in the Netherlands: RVG 104924

8 June 2010

Pharmacotherapeutic group:	Enzyme inhibitors
ATC code:	L02BG04
Route of administration:	oral
Therapeutic indication:	hormone-dependent breast cancer in postmenopausal women
Prescription status:	prescription only
Date of first authorisation in NL:	19 March 2010
Concerned Member States:	Decentralised procedure with DE
Application type/legal basis:	Directive 2001/83/EC, Article 10(1)

For product information for healthcare professionals and users, including information on pack sizes and presentations, see Summary of Product Characteristics (SPC), package leaflet and labelling.

I INTRODUCTION

Based on the review of the quality, safety and efficacy data, the member states have granted a marketing authorisation for Letromedica 2.5 mg film-coated tablets, from Regiomedica GmbH. The date of authorisation was on 19 March 2010 in the Netherlands.

The product is indicated for:

- Adjuvant treatment of postmenopausal women with hormone receptor positive early breast cancer.
- Extended adjuvant treatment of hormone-dependent early breast cancer in postmenopausal women who have received prior standard adjuvant tamoxifen therapy for 5 years.
- First-line treatment in postmenopausal women with hormone-dependent advanced breast cancer.
- Advanced breast cancer in women with natural or artificially induced postmenopausal status after relapse or disease progression, who have previously been treated with anti-oestrogens.

Efficacy has not been demonstrated in patients with hormone-receptor negative breast cancer.

A comprehensive description of the indications and posology is given in the SPC.

Letrozole is a non-steroidal aromatase inhibitor. It inhibits the aromatase enzyme by competitively binding to the haem of the aromatase cytochrome P450. The main source of oestrogen is through changing androgens (sex hormones produced by the adrenal glands) into oestrogen. This is carried out by an enzyme called aromatase. The conversion process is known as aromatisation, and happens mainly in the fatty tissue of the body. Letrozole blocks (reversibly) this process, resulting in a reduction of oestrogen biosynthesis in all tissues where present. Many breast cancers rely on supplies of the hormone oestrogen to grow.

This decentralised procedure concerns a generic application claiming essential similarity with the innovator product Femara 2.5 mg film-coated tablets (NL License RVG 20755) which has been registered in France by Novartis Pharma since 1996 and via a MRP (FR/H/0110/01) in several CMSs. In addition, reference is made to Femara authorisations in the individual member states (reference product).

The marketing authorisation is granted based on article 10(1) of Directive 2001/83/EC.

This type of application refers to information that is contained in the pharmacological-toxicological and clinical part of the dossier of the authorisation of the reference product. A reference product is a medicinal product authorised and marketed on the basis of a full dossier, i.e. including chemical, biological, pharmaceutical, pharmacological-toxicological and clinical data. This information is not fully available in the public domain. Authorisations for generic products are therefore linked to the 'original' authorised medicinal product, which is legally allowed once the data protection time of the dossier of the reference product has expired. For this kind of application, it has to be demonstrated that the pharmacokinetic profile of the product is similar to the pharmacokinetic profile of the reference product. To this end the MAH has submitted a bioequivalence study in which the pharmacokinetic profile of the product is compared with the pharmacokinetic profile of the reference product Femara Tablets 2.5 mg, registered in France. A bioequivalence study is the widely accepted means of demonstrating that difference of use of different excipients and different methods of manufacture have no influence on efficacy and safety. This generic product can be used instead of its reference product.

No new pre-clinical and clinical studies were conducted, which is acceptable for this abridged application.

No scientific advice has been given to the MAH with respect to these products, and no paediatric development programme has been submitted, as this is not required for a generic medicinal product.

II SCIENTIFIC OVERVIEW AND DISCUSSION

II.1 Quality aspects

Compliance with Good Manufacturing Practice
The MEB has been assured that acceptable standards of GMP (see Directive 2003/94/EC) are in place for this product type at all sites responsible for the manufacturing of the active substance as well as for the manufacturing and assembly of this product prior to granting its national authorisation.

Active substance
The active substance is letrozole, an established active substance described in the European Pharmacopoeia (Ph.Eur.*). The active substance is a white or yellowish, crystalline powder, which is practically insoluble in water, freely soluble in methylene chloride, and sparingly soluble in methanol. The molecule is optically inactive and does not exhibit polymorphism.

The Active Substance Master File (ASMF) procedure is used for the active substance. The main objective of the ASMF procedure, commonly known as the European Drug Master File (EDMF) procedure, is to allow valuable confidential intellectual property or 'know-how' of the manufacturer of the active substance (ASM) to be protected, while at the same time allowing the applicant or marketing authorisation holder (MAH) to take full responsibility for the medicinal product, the quality and quality control of the active substance. Competent Authorities/EMEA thus have access to the complete information that is necessary to evaluate the suitability of the use of the active substance in the medicinal product.

Manufacturing process
The manufacturing process consists of a three step synthesis. No Class 1 organic solvents are used. The manufacturing process does not require heavy metal catalysts. The active substance was adequately characterized. Acceptable specifications were adopted for the starting materials, solvents, and reagents.

Quality control of drug substance
The drug substance specification is in accordance with the European Pharmacopoeia with additional requirements for residual solvents and, and particle size. The specification is acceptable in view of the route of synthesis and the various European guidelines. Batch analytical data demonstrating compliance with the drug substance specification were provided for five commercial-scale batches.

Stability of drug substance
Stability data on the active substance were provided for five commercial-scale batches stored at 25°C/60% RH (36 (three batches) and 18 months (two batches)) and 40°C/75% RH (6 months). The batches were adequately stored. The drug substance remained stable under accelerated and long term storage conditions for all parameters tested. No specific trends were observed. On the basis of the available stability data, the claimed re-test period of 12 months is justified. The drug substance does not require specific storage conditions.

* *Ph.Eur. is an official handbook (pharmacopoeia) in which methods of analysis with specifications for substances are laid down by the authorities of the EU.*

Medicinal Product

Composition
Letromedica 2.5 mg is a yellow to dark yellow, round, biconvex, film-coated tablet engraved with 'L' on one face and plain on the other.

The film-coated tablets are packed in Al/PVC/PVdC blisters.

The excipients are:

Tablet core - lactose monohydrate, maize starch, microcrystalline cellulose, sodium starch glycolate type A, magnesium stearate, colloidal anhydrous silica.
Coating - hypromellose, macrogol 400, titanium dioxide (E171), iron oxide yellow (E172).

Pharmaceutical development
The development of the product has been described, the choice of excipients is justified and their functions explained. Pharmaceutical development focussed on particle size of the drug substance and the intra- or extragranular addition of excipients. The dissolution profiles of test and innovator products were compared. Both test and innovator products dissolve rapidly. The packaging material is commonly used for solid oral dosage forms. Moreover, the suitability of the packaging material was tested in stability studies. The pharmaceutical development of the product was adequately performed

Manufacturing process
The manufacturing process consists of a wet granulation step followed by direct compression and coating which are all regarded as conventional manufacturing techniques. The manufacturing process was adequately validated according to relevant European guidelines. Process validation data on the product was presented for two commercial-scale batches of the minimum batch size. The MAH committed to validate another batch of the minimum batch size and three batches of the maximum batch size post authorisation.

Control of excipients
With the exception of the coating material, all excipients comply with the European Pharmacopoeia. For the coating material, a separate specification was provided. The specifications are acceptable.

Quality control of drug product
The product specification includes tests for appearance, identification of letrozole, identification of colourants, hardness, physical dimensions, average tablet mass, assay of letrozole, uniformity of dosage units, related substances, dissolution, and microbial contamination. Release and shelf life limits are identical. The analytical methods were adequately described and the in-house methods adequately validated. Batch analytical data from the proposed production sites were provided on one pilot-scale and two commercial-scale batches, demonstrating compliance with the release specification.

Stability of drug product
Stability data on the product was provided on one pilot and two commercial-scale batches stored at 25°C/60%RH (up to 24 months) and at 40°C/75% RH (six months). In addition, photostability was tested. The conditions used in the stability studies are according to the ICH stability guideline. The batches were stored in the proposed commercial packaging.
Except for a slight increase in average mass at both conditions and a moderate increase in hardness in the two commercial scale batches at accelerated conditions, no specific trends were observed for any of the tested parameters at both storage conditions. Photostability was demonstrated. The proposed shelf-life of 3 years could therefore be granted. The drug product does not require special storage conditions. The MAH committed to continue the ongoing long term stability studies up to 36 months and to place the first three batches at maximum scale on stability.

Specific measures concerning the prevention of the transmission of animal spongiform encephalopathies
Lactose monohydrate is the only ingredient of animal origin. A statement declaring compliance with the *Note for Guidance on Minimising the Risk of Transmitting Animal Spongiform Encephalopathy* (milk sourced from healthy animals under the same conditions as milk collected for human consumption) was provided.

II.2 Non clinical aspects

This product is a generic formulation of Femara 2.5 mg, which is available on the European market. No new preclinical data have been submitted, and therefore the application has not undergone preclinical assessment. This is acceptable for this type of application.

Environmental risk assessment
The product is intended as a substitute for other identical products on the market. The approval of this product will not result in an increase in the total quantity of letrozole released into the environment. It does not contain any component, which results in an additional hazard to the environment during storage, distribution, use and disposal.

II.3 Clinical aspects

Letrozole is a well-known active substance with established efficacy and tolerability.

For this generic application, the MAH has submitted a bioequivalence study in which the pharmacokinetic profile of the test product Letromedica 2.5 mg film-coated tablets (Regiomedica GmbH, Germany) is compared with the pharmacokinetic profile of the reference product Femara 2.5 mg tablets (Novartis Pharma, France).

The choice of the reference product
The choice of the reference product in the bioequivalence study has been justified by comparison of dissolution results and compositions of reference products in different member states.

The formula and preparation of the bioequivalence batch is identical to the formula proposed for marketing.

Design
A single-dose, open-label randomised, two-period, two-treatment, two-sequence, two-way crossover bioequivalence study was carried out under fasted conditions in 26 healthy male subjects, aged 18-33 years. Each subject received a single dose (2.5 mg) of one of the 2 letrozole formulations. There were 2 dosing periods, separated by a washout period of 21 days.

Blood samples were collected predose and at 0.25, 0.5, 0.75, 1.0, 1.25, 1.5, 2, 2.5, 3.0, 3.5, 4.0, 5.0, 6.0, 8.0, 10, 12, 16, 24, 48, 72, 96, 120, 152, 216, and 264 hours after administration of the products.

Analytical/statistical methods
The analytical method has been adequately validated and is considered acceptable for analysis of the plasma samples. The methods used in this study for the pharmacokinetic calculations and statistical evaluation are considered acceptable.

Results
Two subjects withdrew following phase one due to illness: one subject had tonsillitis and the other had glandular fever evaluated by the clinical investigator as remotely and possibly related to the study medication. Twenty-four subjects completed both phases of the study. Pharmacokinetic and statistical analysis were performed on the 24 subjects that completed the study.

Table 1. Pharmacokinetic parameters (non-transformed values; arithmetic mean ± SD, t_{max} (median, range)) of of letrozole under fasted conditions.

Treatment N=24	**AUC_{0-t}** ng.h/ml	**$AUC_{0-\infty}$** ng.h/ml	**C_{max}** ng/ml	**t_{max}** h	**$t_{1/2}$** h
Test	1574 ± 636	1638 ± 719	38.8 ± 9.7	1.50 (0.5-5.0)	46 ±17
Reference	1574 ± 610	1635 ± 674	37.9 ± 9.4	1.25 (0.5-5.0)	45 ±16
***Ratio (90% CI)**	1.00 (0.95-1.04)	1.00 (0.95-1.04)	1.01 (0.95-1.11)	-	-

CV (%)	9	9	18	-	-

$AUC_{0-\infty}$ area under the plasma concentration-time curve from time zero to infinity
AUC_{0-t} area under the plasma concentration-time curve from time zero to t hours
C_{max} maximum plasma concentration
t_{max} time for maximum concentration
$t_{1/2}$ half-life

**ln-transformed values*

The 90% confidence intervals calculated for AUC_{0-t}, $AUC_{0-\infty}$ and C_{max} are in agreement with those calculated by the MAH and are within the bioequivalence acceptance range of 0.80-1.25. Based on the pharmacokinetic parameters of letrozole under fasted conditions, it can be concluded that Letromedica 2.5 mg and Femara 2.5 mg tablets are bioequivalent with respect to rate and extent of absorption, and fulfil the bioequivalence requirements outlined in the relevant CHMP Note for Guidance.

The MEB has been assured that the bioequivalence study has been conducted in accordance with acceptable standards of Good Clinical Practice (GCP, see Directive 2005/28/EC) and Good Laboratory Practice (GLP, see Directives 2004/9/EC and 2004/10/EC).

Risk management plan

Letrozole was first approved in 1996, and there is now more than 10 years post-authorisation experience with the active substance. The safety profile of letrozole can be considered to be well established and no product specific pharmacovigilance issues were identified pre- or postauthorisation which are not adequately covered by the current SPC. Additional risk minimisation activities have not been identified for the reference medicinal product. The MAH has a pharmacovigilance system at their disposal, which is based on the current European legislation. Routine pharmacovigilance activities are sufficient to identify actual or potential risks and a detailed European Risk Management Plan is not necessary for this product.

Product information

SPC

The MAH made a commitment to amend the SPC, PIL and labelling according to the Commission Decision of the reference product Femara (currently under Article 30(2) Referral) by variation. The variation will be submitted after finalisation of the Referral.

Readability test

The package leaflet has been evaluated via a user consultation study in accordance with the requirements of Articles 59(3) and 61(1) of Directive 2001/83/EC. The test consisted of two rounds with 10 participants each. The questions covered the following areas sufficiently: traceability, comprehensibility and applicability. The criterion for readability was met. Based on the test results, some revisions were made to the PIL. The readability test has been sufficiently performed.

III OVERALL CONCLUSION AND BENEFIT-RISK ASSESSMENT

Letromedica 2.5 mg film-coated tablets has a proven chemical-pharmaceutical quality and is a generic form of Femara 2.5 mg film-coated tablets. Femara is a well-known medicinal product with an established favourable efficacy and safety profile.

Bioequivalence has been shown to be in compliance with the requirements of European guidance documents.

The MAH has provided written confirmation that systems and services are in place to ensure compliance with their pharmacovigilance obligations.

The SPC, package leaflet and labelling are in the agreed templates and are in agreement with other letrozole containing products.

The Board followed the advice of the assessors.

There was no discussion in the CMD(h). Agreement between member states was reached during a written procedure. The member states, on the basis of the data submitted, considered that essential similarity has been demonstrated for Letromedica 2.5 mg with the reference product, and have therefore granted a marketing authorisation. The decentralised procedure was finished on 18 February 2010. Letromedica 2.5 mg film-coated tablets was authorised in the Netherlands on 19 March 2010.

A European harmonised birth date has been allocated (24 July 1996) and subsequently the first data lock point for letrozole is October 2011. The first PSUR will cover the period from February 2010 to October 2011, after which the PSUR submission cycle is 3 years.

The date for the first renewal will be: 11 March 2015.

The following post-approval commitments have been made during the procedure:

Quality - medicinal product

- The MAH committed to validate another batch of the minimum batch size and three batches of the maximum batch size.
- The MAH committed to continue the ongoing long term stability studies up to 36 months and to place the first three batches at maximum scale on stability.

Product information

- The MAH committed to amend SPL, PL and labelling according to the Commission Decision on the reference product Femara, which is currently under Article 30(2) Referral. The variation will be submitted after finalisation of the Referral.

List of abbreviations

ASMF	Active Substance Master File
ATC	Anatomical Therapeutic Chemical classification
AUC	Area Under the Curve
BP	British Pharmacopoeia
CEP	Certificate of Suitability to the monographs of the European Pharmacopoeia
CHMP	Committee for Medicinal Products for Human Use
CI	Confidence Interval
C_{max}	Maximum plasma concentration
CMD(h)	Coordination group for Mutual recognition and Decentralised procedure for human medicinal products
CV	Coefficient of Variation
EDMF	European Drug Master File
EDQM	European Directorate for the Quality of Medicines
EU	European Union
GCP	Good Clinical Practice
GLP	Good Laboratory Practice
GMP	Good Manufacturing Practice
ICH	International Conference of Harmonisation
MAH	Marketing Authorisation Holder
MEB	Medicines Evaluation Board in the Netherlands
OTC	Over The Counter (to be supplied without prescription)
PAR	Public Assessment Report
Ph.Eur.	European Pharmacopoeia
PIL	Package Leaflet
PSUR	Periodic Safety Update Report
SD	Standard Deviation
SPC	Summary of Product Characteristics
$t_{½}$	Half-life
t_{max}	Time for maximum concentration
TSE	Transmissible Spongiform Encephalopathy
USP	Pharmacopoeia in the United States

STEPS TAKEN AFTER THE FINALISATION OF THE INITIAL PROCEDURE - SUMMARY

Scope	Procedure number	Type of modification	Date of start of the procedure	Date of end of the procedure	Approval/ non approval	Assessment report attached