LÄKEMEDELSVERKET
MEDICAL PRODUCTS AGENCY

Public Assessment Report
Scientific discussion

Medicinsk Luft Air Liquide, air, medicinal

SE/H/1106/01/MR

This module reflects the scientific discussion for the approval of Medicinsk Luft Air Liquide, air, medicinal. The procedure was finalised at 2011-09-16. For information on changes after this date please refer to the module 'Update'.

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I. INTRODUCTION

AIR LIQUIDE Santé INTERNATIONAL has applied for a marketing authorisation for Medicinsk Luft Air Liquide, air, medicinal. For approved indications, see the Summary of Product Characteristics.

II. QUALITY ASPECTS

II.1 Introduction

Medicinsk Luft Air Liquide is presented in the form of Medicinal gas, compressed, containing 100% atmospheric air. There is no excipient in Medicinal Air. The medicinal air is filled into gas cylinder.

II.2 Drug Substance

The active ingredient is Atmospheric Air.

II.3 Medicinal Product

Medicinsk Luft Air Liquide 100 % Medicinal gas, compressed," is formulated without any excipients
The drug product is produced by compressing filtered atmospheric air, drying and purifying it and filling the compressed air into gas cylinders.

The manufacturing process has been sufficiently described and critical steps identified. Results from the process validation studies confirm that the process is under control and ensure both batch to batch reproducibility and compliance with the product specification.

The tests and limits in the specification are considered appropriate to control the quality of the finished product in relation to its intended purpose.

Stability studies presented support the shelf life claimed in the SPC.

III. NON-CLINICAL ASPECTS

Pharmacodynamic, pharmacokinetic and toxicological properties of air are well known. As air is a widely used, well-known active substance, no further studies are required. Overview based on literature review is, thus, appropriate.

The non-clinical overview on the pre-clinical pharmacology, pharmacokinetics and toxicology is adequate and is considered sufficient to support the application. The proposed SPC describes the pharmaco/toxicological properties of oxygen and appropriate warning and contraindication statements are made.

There are no objections for approval of Medicinsk Luft Air Liquide from a non-clinical point of view.

IV. CLINICAL ASPECTS

IV.1 Pharmacokinetics

N/A

IV.2 Pharmacodynamics

Medicinal air is a gas identical to ambient atmospheric air in its oxygen and nitrogen composition. It is mainly used on account of its oxygen content.
Air normally contains approximately 21% oxygen, equivalent (at normal barometric pressure) to a partial pressure of 159 mmHg. The remaining 79% is mainly represented by nitrogen gas, which has no biological properties, is not absorbed in the blood and may be regarded as completely inert.
The active substance, air, is one of the basic essentials of maintenance of life. The uptake, distribution and metabolism of air are driven by the actual respiratory physiology in the body. The aim of the respiratory physiology is to maintain enough available oxygen for the metabolic demands of the tissue.

IV.3 Clinical efficacy

Medicinal air is a well-known product and the medical use of medicinal air is well established. The availability of medicinal air has a long history and its use is customary in all healthcare facilities. Having medicinal air at disposal is today a natural part of anaesthesia, emergency care and intensive care. Consequently no specific clinical studies have been conducted to support the efficacy of this application and the submitted dossier is therefore purely bibliographic. This is considered acceptable as Medicinal air has a well established medical use, with recognised efficacy and an acceptable level of safety.

Use of medicinal air in clinical practice is strongly linked to the use of mechanical ventilation. Air can be used alone or supplemented with oxygen.
The primary goal of mechanical ventilation is to improve gas exchange and reduce the work of breathing in patients with acute respiratory failure without causing iatrogenic lung injury. During ventilation in anaesthesia, as well as intensive care, the fresh gas used is composed of a mixture of medicinal air, medicinal oxygen and eventually volatile anaesthetics.
This is in order to achieve a desired/sufficient vol.% concentration of oxygen, to create a desired oxygen fraction of inspired air (FiO2) , using the calculation:
FiO2 = [(number of litres of air/minute x 21) + (number of litres of oxygen/minute x 100] / (number of litres of air/minute + number of litres of oxygen/minute)

The administration of Medicinal air should be given via special equipment. With the aid of this equipment, medicinal air is added to the gas that is to be inspired, and on expiration the air that has not been absorbed is mixed with the surrounding air (non-rebreathing system).
In anaesthesia particularly, special equipment is often used which allows a greater or lesser proportion of the exhaled gas to be recirculated in the respiratory system and rebreathed (so-called rebreathing system).

Medicinal air is also used in all other areas where the purity and the oxygen concentration of the inspired air are of critical importance; e.g. as pure air in the care of immuno-suppressed patients such as in cases of organ/cell transplantation or extensive burn wounds.

It is also used in paediatric care and neonatal care, as propellant in nebulisation treatment.
A Nebulizer is a device that can convert a liquid into aerosol droplets of a size that can be inhaled by the patients. It is therefore a way to administer a drug to the airways or lungs in the form of fine droplets suspended in air.
Nebulization has multiple clinical indications i.e. such as asthma, cystic fibrosis, chronic obstructive pulmonary disease, pneumocystis carinii pneumonia, acute laryngitis and acute broncholitis.
The most common use of nebulised therapy is to deliver bronchodilator drugs to patients with astma or COPD.

IV.4 Clinical safety

Air itself is not toxic. Therefore the adverse effects due to the use of medical air are related to the use of mechanical ventilation or nebulization. The mixing of gases is done just prior to administration to the patient and should be adjusted to the medical needs of the individual patients.
All kinds of pollutants of the inspired gas mixture may have a negative influence and hypoxic gas mixture may cause harm.

Children differ from adults in size, different breathing patterns, tidal volumes and airway geometry, therefore specific precautions should be taken in case of treatment by mechanical ventilation or nebulisation.

V. OVERALL CONCLUSION, BENEFIT/RISK ASSESSMENT AND RECOMMENDATION

User consultation
A user consultation with target patient groups on the package information leaflet (PIL) has not been performed. The applicant has committed to submit the results of a user test in a variation within three months after finalisation of the procedure.

Medicinal air is a well-known product and the medical use of medicinal air is well established. Having medicinal air at disposal is today an important part of anaesthesia, emergency care and intensive care with recognised efficacy and an acceptable level of safety. The risk/benefit analysis of medicinal air is considered favourable.

VI. APPROVAL

The Mutual recognition procedure for Medicinsk Luft Air Liquide
air, medicinal was successfully finalised on 2011-09-16.

LÄKEMEDELSVERKET
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Public Assessment Report – Update

Scope	Procedure number	Product Information affected	Date of start of the procedure	Date of end of procedure	Approval/ non approval	Assessment report attached
						Y/N (version)

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