



Tiotropium

Updated: July 7, 2017.

OVERVIEW

Introduction

Tiotropium is a synthetic anticholinergic agent that is used as an inhalant for treatment of acute bronchospasm due to chronic bronchitis or emphysema. Tiotropium has not been implicated in causing liver enzyme elevations or clinically apparent acute liver injury.

Background

Tiotropium (tye" oh troe' pee um) is a synthetic quaternary ammonium anticholinergic which inhibits the muscarinic actions of acetylcholine on autonomic nerve endings, decreasing bronchial smooth muscle contractions and alleviating bronchospasm in patients with chronic obstructive pulmonary disease (COPD). Tiotropium has potent activity against muscarinic acetylcholine receptors found in bronchial smooth muscle. Its quaternary ammonium structure decreases its ability to cross lipid membranes such as the blood brain barrier. Tiotropium was approved for use in the United States in 2004 for use as a respiratory inhalant as maintenance treatment of bronchospasm associated with chronic bronchitis and emphysema. Tiotropium is available under the brand name Spiriva in capsules of 18 mcg for use in an inhaler (not to be swallowed). The typical dose in adults is two inhalations of the powder from one capsule once daily. When given by inhaler, tiotropium has minimal systemic absorption. Side effects of tiotropium are mild, but can include the typical anticholinergic effects of dryness of the mouth and eyes, visual blurring, constipation, tachycardia and palpitations, anxiety and restlessness. Tiotropium use can cause paradoxical bronchospasm. Anticholinergic agents can precipitate acute narrow angle glaucoma and acute urinary retention.

Hepatotoxicity

Like other anticholinergic agents, tiotropium has not been linked to episodes of liver enzyme elevations or clinically apparent liver injury. A major reason for its safety may relate to its low systemic absorption when administered by inhaler.

References on the safety and potential hepatotoxicity of anticholinergics are given together after the Overview section on the Anticholinergic Agents.

Drug Class: [Anticholinergic Agents](#)

PRODUCT INFORMATION

REPRESENTATIVE TRADE NAMES

Tiotropium – Spiriva®, Tiova®

DRUG CLASS

Anticholinergic Agents

COMPLETE LABELING

Product labeling at DailyMed, National Library of Medicine, NIH

CHEMICAL FORMULA AND STRUCTURE

DRUG	CAS REGISTRY NUMBER	MOLECULAR FORMULA	STRUCTURE
Tiotropium	136310-93-5	C ₁₉ H ₂₂ N ⁺ O ₄ S ₂ .Br ⁻	