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Morphine

Updated: April 25, 2019.

OVERVIEW

Introduction

Morphine is one of the natural plant alkaloids found in opium and is the prototype opiate, against which other derivatives are measured in terms of analgesic effects and side effects. Morphine has not been linked to serum enzyme elevations during therapy or to clinically apparent liver injury.

Background

Morphine is a natural alkaloid that is derived from resin extracts from the seeds of the opium poppy, Papaver somniferum. Morphine has potent and profound analgesic effects and has been used in clinical medicine for almost two hundred years. Morphine acts by engagement in cell surface opiate receptors (predominant μ type receptors) that are found in the central nervous system, but also heart, lung, vascular and intestinal cells. Current indications are for severe pain, pre- and postoperative analgesia, control of pain from angina pectoris or acute myocardial infarction and therapy of pulmonary edema. Morphine is available in multiple formulations, including oral tablets and syrups, suppositories, and solutions for injection in multiple concentrations. The typical dose of morphine for analgesia in adults is 10 mg every 3 to 4 hours by the subcutaneous, intramuscular or intravenous route. Morphine is well absorbed orally, but has extensive and variable first pass metabolism, so that its effect orally is somewhat variable. Side effects of opiates are many and include sedation, respiratory depression, confusion, euphoria, agitation, itching, abdominal bloating, nausea, vomiting and diarrhea. Morphine is a controlled substance and classified as a Schedule II drug, indicating that it has medical usefulness, but also a high potential for physical and psychological dependency and abuse.

Hepatotoxicity

Therapy with morphine has not been linked to serum enzyme elevations. Hepatitis B and C are common among persons with opiate addiction and illicit injection drug use, but the opiates themselves appear to have little hepatotoxic potential. There have been no convincing cases of idiosyncratic acute, clinically apparent liver injury attributed to morphine. Morphine and other opiates have little hepatic metabolism and they are generally excreted unchanged in the urine, perhaps accounting for their relative lack of hepatotoxicity.

References on the safety and potential hepatotoxicity of morphine are given in the Overview section of the Opioids.

Drug Class: Opioids

PRODUCT INFORMATION

REPRESENTATIVE TRADE NAMES

Morphine – Generic, Duramorph®

DRUG CLASS

Opioids

COMPLETE LABELING

Product labeling at DailyMed, National Library of Medicine, NIH

CHEMICAL FORMULA AND STRUCTURE

DRUG	CAS REGISTRY NO.	MOLECULAR FORMULA	STRUCTURE
Morphine	57-27-2	C17-H19-N-O3