

# Statin Use Linked to Reduced Incidence of RA

BY MITCHEL L. ZOLER

PHILADELPHIA — Statin use was linked with a significant reduction in the incidence of rheumatoid arthritis in a retrospective, observational study of about 200,000 people in Israel.

The anti-inflammatory effect of statins is the hypothesized mechanism by which the drugs appear to have protected against development of rheumatoid arthritis

(RA), Dr. Howard Amital said at the annual meeting of the American College of Rheumatology.

Added support for a causal relationship came from the observations that statin use had no impact on the incidence of osteoarthritis, and the protective effect for RA was greatest in people who received the highest statin dosages or the most potent agents.

“The degree of [RA] lowering with

statins was remarkable,” said Dr. Amital, head of the department of medicine at Meir Medical Center in Kfar-Saba, Israel.

The investigators used medical records from patients enrolled in a large Israeli health maintenance organization that had 1.8 million enrollees during 1998-2007. The study excluded people who had an existing diagnosis of RA, osteoarthritis (OA), or rheumatic fever at the start of the study period, and also ex-

cluded people being treated with a corticosteroid, disease-modifying anti-rheumatic drug, or biologic agent.

During the study period, about 200,000 people received statin treatment and did not have a preexisting diagnosis of RA or OA. During an average follow-up of 5 years, a total of 2,578 of these people received an initial diagnosis of RA and 8,906 received an initial diagnosis of OA.

To assess the impact of statin treatment, Dr. Amital and his associates broke the study population into five groups based on the percentage of days during follow-up that they were on statin treatment: 0%-19%, 20%-39%, 40%-59%, 60%-79%, and 80%-100%. The relative risk for developing RA was significantly

**The statin effect seemed greatest in subjects aged 35-44 years, but no association was seen in those aged 75 or older.**



DR. AMITAL

related to statin use. Among people on a statin for 0%-19% of the follow-up period, the RA incidence rate was set as 1.0. The rate dropped with increased use, reaching a nadir of 0.6 in those on a statin for 80%-100% of follow-up, a statistically significant difference, compared with the reference subgroup.

In contrast, the incidence rate for OA showed much less change across the range of statin use. In people on a statin for 80%-100% of follow-up, the rate of new OA was 85% of the rate in those who used a statin for 0%-19% of the follow-up period.

The impact of statin use on RA varied with patient age. The statin effect appeared to be greatest in those aged 35-44 years. Among enrollees aged 75 or older, statin use had no significant association with RA incidence. The link between statin use and reduced RA incidence was very similar in women and men.

Dr. Amital and his associates also performed another analysis that stratified statin use into three tiers on the basis of dosage and drug potency. For example, a dosage of lovastatin of 40 mg/day or less was categorized as low efficacy (a dosage expected to reduce serum cholesterol by 30% or less), whereas an atorvastatin dosage of 10 mg/day was categorized as moderate efficacy (expected to cut serum cholesterol by 31%-40%). A lovastatin dosage of 80 mg/day and an atorvastatin dosage of 20 mg/day or greater were categorized as high efficacy (expected to reduce serum cholesterol by 41% or more).

This analysis showed that while all three statin categories were linked with significant reductions in RA incidence, the high-efficacy category was associated with the largest reduction in RA, and the low-efficacy category was linked with the smallest reduction.

Dr. Amital said that he and his associates had no financial disclosures. ■

## BRIEF SUMMARY - Consult full prescribing information before use.

TussiCaps®  
(Hydrocodone Polistirex and Chlorpheniramine Polistirex)  
Extended-Release Capsules

Rx only

### CONTRAINDICATIONS

TussiCaps® extended-release capsules are contraindicated in patients with a known allergy or sensitivity to hydrocodone or chlorpheniramine.

The use of TussiCaps® extended-release capsules are contraindicated in children less than 6 years of age due to the risk of fatal respiratory depression.

### WARNINGS

**Respiratory Depression** – As with all narcotics, TussiCaps® extended-release capsules produce dose-related respiratory depression by directly acting on brain stem respiratory centers. Hydrocodone affects the center that controls respiratory rhythm, and may produce irregular and periodic breathing. Caution should be exercised when TussiCaps® extended-release capsules are used postoperatively and in patients with pulmonary disease, or whenever ventilatory function is depressed. If respiratory depression occurs, it may be antagonized by the use of naloxone hydrochloride and other supportive measures when indicated (see **OVERDOSAGE**).

**Head Injury and Increased Intracranial Pressure** – The respiratory depressant effects of narcotics and their capacity to elevate cerebrospinal fluid pressure may be markedly exaggerated in the presence of head injury, other intracranial lesions, or a pre-existing increase in intracranial pressure. Furthermore, narcotics produce adverse reactions, which may obscure the clinical course of patients with head injuries.

**Acute Abdominal Conditions** – The administration of narcotics may obscure the diagnosis or clinical course of patients with acute abdominal conditions.

**Obstructive Bowel Disease** – Chronic use of narcotics may result in obstructive bowel disease especially in patients with underlying intestinal motility disorder.

**Pediatric Use** – The use of TussiCaps® extended-release capsules are contraindicated in children less than 6 years of age (see **CONTRAINDICATIONS**).

In pediatric patients, as well as adults, the respiratory center is sensitive to the depressant action of narcotic cough suppressants in a dose-dependent manner. Caution should be exercised when administering TussiCaps® extended-release capsules to pediatric patients 6 years of age and older. Overdose or concomitant administration of TussiCaps® extended-release capsules with other respiratory depressants may increase the risk of respiratory depression in pediatric patients. Benefit to risk ratio should be carefully considered, especially in pediatric patients with respiratory embarrassment (e.g., croup) (see **PRECAUTIONS**).

### PRECAUTIONS

#### General

Caution is advised when prescribing this drug to patients with narrow-angle glaucoma, asthma, or prostatic hypertrophy.

**Special Risk Patients** – As with any narcotic agent, TussiCaps® extended-release capsules should be used with caution in elderly or debilitated patients and those with severe impairment of hepatic or renal function, hypothyroidism, Addison's disease, prostatic hypertrophy, or urethral stricture. The usual precautions should be observed and the possibility of respiratory depression should be kept in mind.

#### Information for Patients

As with all narcotics, TussiCaps® extended-release capsules may produce marked drowsiness and impair the mental and/or physical abilities required for the performance of potentially hazardous tasks such as driving a car or operating machinery; patients should be cautioned accordingly. TussiCaps® extended-release capsules must not be diluted with fluids or mixed with other drugs as this may alter the resin-binding and change the absorption rate, possibly increasing the toxicity.

Keep out of the reach of children.

**Cough Reflex** – Hydrocodone suppresses the cough reflex; as with all narcotics, caution should be exercised when TussiCaps® extended-release capsules are used postoperatively, and in patients with pulmonary disease.

#### Drug Interactions

Patients receiving narcotics, antihistamines, antipsychotics, anti-anxiety agents, or other CNS depressants

(including alcohol) concomitantly with TussiCaps® extended-release capsules may exhibit an additive CNS depression. When combined therapy is contemplated, the dose of one or both agents should be reduced.

The use of MAO inhibitors or tricyclic antidepressants with hydrocodone preparations may increase the effect of either the antidepressant or hydrocodone.

The concurrent use of other anticholinergics with hydrocodone may produce paralytic ileus.

#### Carcinogenesis, Mutagenesis, Impairment of Fertility

Carcinogenicity, mutagenicity and reproductive studies have not been conducted with TussiCaps® extended-release capsules.

#### Pregnancy

**Teratogenic Effects.** *Pregnancy Category C* – Hydrocodone has been shown to be teratogenic in hamsters when given in doses 700 times the human dose. There are no adequate and well-controlled studies in pregnant women. TussiCaps® extended-release capsules should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

**Nonteratogenic Effects** – Babies born to mothers who have been taking opioids regularly prior to delivery will be physically dependent. The withdrawal signs include irritability and excessive crying, tremors, hyperactive reflexes, increased respiratory rate, increased stools, sneezing, yawning, vomiting, and fever. The intensity of the syndrome does not always correlate with the duration of maternal opioid use or dose.

#### Labor and Delivery

As with all narcotics, administration of TussiCaps® extended-release capsules to the mother shortly before delivery may result in some degree of respiratory depression in the newborn, especially if higher doses are used.

#### Nursing Mothers

It is not known whether this drug is excreted in human milk. Because many drugs are excreted in human milk and because of the potential for serious adverse reactions in nursing infants from TussiCaps® extended-release capsules, a decision should be made whether to discontinue nursing or to discontinue the drug, taking into account the importance of the drug to the mother.

#### Pediatric Use

The use of TussiCaps® extended-release capsules are contraindicated in children less than 6 years of age (see **CONTRAINDICATIONS AND ADVERSE REACTIONS, Respiratory, Thoracic and Mediastinal Disorders**).

TussiCaps® extended-release capsules should be used with caution in pediatric patients 6 years of age and older (see **WARNINGS, Pediatric Use**).

#### Geriatric Use

Clinical studies of hydrocodone polistirex and chlorpheniramine polistirex extended-release did not include sufficient numbers of subjects aged 65 and over to determine whether they respond differently from younger subjects. Other reported clinical experience has not identified differences in responses between the elderly and younger patients. In general, dose selection for an elderly patient should be cautious, usually starting at the low end of the dosing range, reflecting the greater frequency of decreased hepatic, renal, or cardiac function, and of concomitant disease or other drug therapy.

This drug is known to be substantially excreted by the kidney, and the risk of toxic reactions to this drug may be greater in patients with impaired renal function. Because elderly patients are more likely to have decreased renal function, care should be taken in dose selection, and it may be useful to monitor renal function.

### ADVERSE REACTIONS

#### Gastrointestinal Disorders

Nausea and vomiting may occur; they are more frequent in ambulatory than in recumbent patients. Prolonged administration of TussiCaps® extended-release capsules may produce constipation.

#### General Disorders and Administration Site Conditions

Death

#### Nervous System Disorders

Sedation, drowsiness, mental clouding, lethargy, impairment of mental and physical performance, anxiety, fear, dysphoria, euphoria, dizziness, psychic dependence, mood changes.

#### Renal and Urinary Disorders

Ureteral spasm, spasm of vesical sphincters, and urinary retention have been reported with opiates.

#### Respiratory, Thoracic and Mediastinal Disorders

Dryness of the pharynx, occasional tightness of the chest, and respiratory depression (see **CONTRAINDICATIONS**).

TussiCaps® extended-release capsules may produce

dose-related respiratory depression by acting directly on brain stem respiratory centers (see **OVERDOSAGE**). Use of TussiCaps® in children less than 6 years of age has been associated with fatal respiratory depression. Overdose with TussiCaps® extended-release capsules in children 6 years of age and older, in adolescents, and in adults has been associated with fatal respiratory depression.

#### Skin and Subcutaneous Tissue Disorders

Rash, pruritus.

### DRUG ABUSE AND DEPENDENCE

TussiCaps® extended-release capsules are Schedule III narcotics. Psychic dependence, physical dependence and tolerance may develop upon repeated administration of narcotics; therefore, TussiCaps® extended-release capsules should be prescribed and administered with caution. However, psychic dependence is unlikely to develop when TussiCaps® extended-release capsules are used for a short time for the treatment of cough. Physical dependence, the condition in which continued administration of the drug is required to prevent the appearance of a withdrawal syndrome, assumes clinically significant proportions only after several weeks of continued oral narcotic use, although some mild degree of physical dependence may develop after a few days of narcotic therapy.

### OVERDOSAGE

**Signs and Symptoms** – Serious overdosage with hydrocodone is characterized by respiratory depression (a decrease in respiratory rate and/or tidal volume, Cheyne-Stokes respiration, cyanosis), extreme somnolence progressing to stupor or coma, skeletal muscle flaccidity, cold and clammy skin, and sometimes bradycardia and hypotension. Although miosis is characteristic of narcotic overdose, mydriasis may occur in terminal narcosis or severe hypoxia. In severe overdosage, apnea, circulatory collapse, cardiac arrest and death may occur. The manifestations of chlorpheniramine overdosage may vary from central nervous system depression to stimulation.


**Treatment** – Primary attention should be given to the reestablishment of adequate respiratory exchange through provision of a patent airway and the institution of assisted or controlled ventilation. The narcotic antagonist naloxone hydrochloride is a specific antidote for respiratory depression which may result from overdosage or unusual sensitivity to narcotics including hydrocodone. Therefore, an appropriate dose of naloxone hydrochloride should be administered, preferably by the intravenous route, simultaneously with efforts at respiratory resuscitation. Since the duration of action of hydrocodone in this formulation may exceed that of the antagonist, the patient should be kept under continued surveillance and repeated doses of the antagonist should be administered as needed to maintain adequate respiration. For further information, see full prescribing information for naloxone hydrochloride. An antagonist should not be administered in the absence of clinically significant respiratory depression. Oxygen, intravenous fluids, vasopressors and other supportive measures should be employed as indicated. Gastric emptying may be useful in removing unabsorbed drug.

A Schedule CIII Narcotic.

#### For Medical Information

Contact: Product Monitoring Department  
Phone: 800-778-7898

Manufactured by:  
Mallinckrodt Inc.  
Hazelwood, Missouri  
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Rev 060308v11

