200 mm

Micardis® Tablets, 20 mg, 40 mg and 80 mg

10 mm

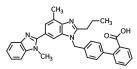
Prescribing Information

USE IN PREGNANCY When used in pregnancy during the second and third trimesters, drugs that act directly on the nen used in pregnancy during the second and time timesters, oruge that act dimetry nin-angiotensin system can cause injury and even death to the developing fetus. Whe regnancy is detected, MICARDIS® tablets should be discontinued as soon as possible. See WARNINGS: Fetal/Neonatal Morbidity and Mortality

DESCRIPTION

MICARDIS[®] (telmisartan) is a nonpeptide angiotensin II receptor (type AT₁) antagonist. nisartan is chemically described as 4'-[(1,4'-dimethyl-2'-propyl [2,6'-bi-1H-benzimidazol]-

yl)methyl]-[1,1'-biphenyl]-2-carboxylic acid. Its empirical formula is $C_{33}H_{30}N_4O_2$, its molec-r weight is 514.63, and its structural formula is: 1'-vl)methvl]-[1,1'-biph



artan is a white to slightly vellowish solid. It is practically insoluble in water and in the pH range of 3 to 9, sparingly soluble in strong acid (except insoluble in hydrochloric acid), and ng bas

MICARDIS is available as tablets for oral administration, containing 20 mg, 40 mg or 80 mg of telmisartan. The tablets contain the following inactive ingredients: sodium hydroxide, meglumine, povidone, sorbitol, and magnesium stearate. MICARDIS tablets are hygroscopic and require protection from moisture. CLINICAL PHARMACOLOGY

Mechanism of Action

Angiotensin II is formed from angiotensin I in a reaction catalyzed by angiotensin-converting Angiotensin II is formed from angiotensin I in a reaction catalyzed by angiotensin-converting enzyme (ACE, kininase II). Angiotensin II is the principal pressor agent of the renin-angiotensin system, with effects that include vasoconstriction, stimulation of synthesis and release of aldosterone, cardiac stimulation, and renal reabsorption of sodium. Telmisartan blocks the vasoconstrictor and aldosterone-secreting effects of angiotensin II by selectively blocking the binding of angiotensin II to the AT₁ receptor in many tissues, such as vascular smooth muscle and the adrenal gland. Its action is therefore independent of the pathways for angiotensin II synthesis. angiotensin II synthesis.

There is also an AT₂ receptor found in many tissues, but AT₂ is not known to be associated with tasis. Telmisartan has much greater affinity (>3,000 fold) for the AT₁ eptor than for the AT₂ receptor.

lockade of the renin-angiotensin system with ACE inhibitors, which inhibit the bios thesis of angiotensin II from angiotensin I, is widely used in the treatment of hypertension. ACE inhibitors also inhibit the degradation of bradykinin, a reaction also catalyzed by ACE. Because telmisartan does not inhibit ACE (kininase II), it does not affect the response to bradykinin. Whether this difference has clinical relevance is not vet known. Telmisartan does not bind to or block other hormone receptors or ion channels known to be important in cardiovascular re

Blockade of the angiotensin II receptor inhibits the negative regulatory feedback of angiotensin II on renin secretion, but the resulting increased plasma renin activity and angiotensin II circulating levels do not overcome the effect of telmisartan on blood pressure.

Pharmacokinetics General

Following oral administration, peak concentrations (C_{max}) of telmisartan are reached in 0.5-1 Following oral administration, peak concentrations (C_{max}) of telmisartan are reached in 0.5-1 hour after dosing. Food slightly reduces the bioavailability of telmisartan, with a reduction in the area under the plasma concentration-time curve (AUC) of about 6% with the 40 mg tablet and about 20% after a 160 mg dose. The absolute bioavailability of telmisartan is dose dependent. At 40 and 160 mg the bioavailability was 42% and 58%, respectively. The pharma-cokinetics of orally administered telmisartan are nonlinear over the dose range 20-160 mg, with greater than proportional increases of plasma concentrations (C_{max} and AUC) with increasing doses. Telmisartan shows bi-exponential decay kinetics with a terminal elimination half life of approximately 24 hours. Trough plasma concentrations of telmisartan has an accumula-tion index in plasma of 1.5 to 2.0 upon presented once divid dosing on index in plasma of 1.5 to 2.0 upon repeated once daily dosing

Metabolism and Flimination

Rubbinsh and Emmandom llowing either intravenous or oral administration of ¹⁴C-labeled telmisartan, most of the ministered dose (>97%) was eliminated unchanged in feces via biliary excretion; only mir nounts were found in the urine (0.91% and 0.49% of total radioactivity, respectively).

nisartan is metabolized by conjugation to form a pharmacologically inactive acylgluonide: the glucuronide of the parent compound is the only metabolite that has been identified in human plasma and urine. After a single dose, the glucuronide represents approximately 11% of the measured radioactivity in plasma. The cytochrome P450 isoenzymes are not involved in the metabolism of telmisartan.

Total plasma clearance of telmisartan is >800 mL/min. Terminal half-life and total clearance ppear to be independent of dose.

Distribution

elmisartan is highly bound to plasma proteins (>99.5%), mainly albumin and α_1 - acid glycotein. Plasma protein binding is constant over the concentration range achieved with recom-ended doses. The volume of distribution for telmisartan is approximately 500 liters indicating ional tissue binding

Special Populations Pediatric: Telmisartan pharmacokinetics have not been investigated in patients <18 years of

Geriatric: The pharmacokinetics of telmisartan do not differ between the elderly and those younger than 65 years (see DOSAGE AND ADMINISTRATION).

Gender: Plasma concentrations of telmisartan are generally 2-3 times higher in females than in males. In clinical trials, however, no significant increases in blood pressure response or in the incidence of orthostatic hypotension were found in women. No dosage adjustment is neces-

Renal Insufficiency: No dosage adjustment is necessary in patients with decreased renal funcved from blood by hemofiltration (see PRECAUTIONS and tan is not remo DOSAGE AND ADMINISTRATION).

Hepatic Insufficiency: In patients with hepatic insufficiency, plasma concentrations of telmi artan are increased, and absolute bioavailability approaches 100% (see PRECAUTIONS and DOSAGE AND ADMINISTRATION).

Drug Interactions: See PRECAUTIONS, Drug Interactions.

Pharmacodynamics

n normal volunteers, a dose of telmisartan 80 mg inhibited the pressor response to an intra-

Boehringer Ingelheim

| 10 mm

10 mm

315 mm

venous infusion of angiotensin II by about 90% at peak plasma concentrations with approximately 40% inhibition persisting for 24 hours. Plasma concentration of angiotensin II and plasma renin activity (PRA) increased in a dose

dependent manner after single administration of telmisartan to healthy subjects and robest administration to hypertensive patients. The once-daily administration of up to 80 mg telmis artan to healthy subjects did not influence plasma aldosterone concentrations. In multiple dose studies with hypertensive patients, there were no clinically significant changes in elec-tedutes (comm potentium or sodium) or in multiple trolytes (serum potassium or sodium), or in metabolic function (including serum levels of cho lesterol, triglycerides, HDL, LDL, glucose, or uric acid).

In 30 hypertensive patients with normal renal function treated for 8 weeks with telmisartan 80 In so hypertensive patients with normal renarmation treated for 8 weeks with termsartan 80 mg or telmsartan 80 mg in combination with hydrochlorothiazide 12.5 mg, there were no clini cally significant changes from baseline in renal blood flow, glomerular filtration rate, filtration fraction, renovascular resistance, or creatinine clearance.

Clinical Trials

The antihypertensive effects of MICARDIS (telmisartan) have been demonstrated in six principal placebo-controlled clinical trials, studying a range of 20-160 mg; one of these examined th ntihypertensive effects of telmisartan and hydrochlorothiazide in combination. The studies nvolved a total of 1773 patients with mild to moderate hypertension (diastolic blood pressure of 95-114 mmHg), 1031 of whom were treated with telmisartan. Following once daily adminis tration of telmisartan, the magnitude of blood pressure reduction from baseline after placebo subtraction was approximately (SBP/DBP) 6-8/6 mmHg for 20 mg, 9-13/6-8 mmHg for 40 mg, and 12-13/7-8 mmHg for 80 mg. Larger doses (up to 160 mg) did not appear to cause a furthe decrease in blood pressure.

Upon initiation of antihypertensive treatment with telmisartan, blood pressure was reduced after the first dose, with a maximal reduction by about 4 weeks. With cessation of treatmen after the first dose, with a maximal reduction by about 4 weeks. With cessation of treatment with MICARDIS tablets, blood pressure gradually returned to baseline values over a period of several days to one week. During long term studies (without placebo control) the effect of telmisartan appeared to be maintained for up to at least one year. The antihypertensive effect of telmisartan is not influenced by patient age, gender, weight or body mass index. Blood pres-sure response in black patients (usually a low-renin population) is noticeably less than that in Caucasian patients. This has been true for most, but not all, angiotensin II antagonists and ACE inbittore. ACE inhibitors.

In a controlled study, the addition of telmisartan to hydrochlorothiazide produced an additio dose-related reduction in blood pressure that was similar in magnitude to the reduction achieved with telmisartan monotherapy. Hydrochlorothiazide also had an added blood pres sure effect when added to telmisartan.

The onset of antihypertensive activity occurs within 3 hours after administration of a single of dose. At doses of 20, 40, and 80 mg, the antihypertensive effect of once daily administration of telmisartan is maintained for the full 24-hour dose interval. With automated ambulatory blood pressure monitoring and conventional blood pressure measurements, the 24-hour trough-to-peak ratio for 40-80 mg doses of telmisartan was 70-100% for both systolic and diastolic blood pressure. The incidence of symptomatic orthostasis after the first dose in all controlled trials was low (0.04%).

There were no changes in the heart rate of patients treated with telmisartan in controlled trials INDICATIONS AND USAGE

sartan) is indicated for the treatment of hypertension. It may be used alone or MICARDIS (telmi in combination with other antihypertensive agents.

CONTRAINDICATIONS

MICARDIS (clemisartan) is contraindicated in patients who are hypersensitive to any con nent of this product.

WARNINGS

atal Morbidity and Mortality

Drugs that act directly on the renin-angiotensin system can cause fetal and neonatal morbidity and death when administered to pregnant women. Several dozen cases have been reported in the world literature in patients who were taking angiotensin converting enzyme inhibitors. When pregnancy is detected, MICARDIS (telmisartan) tablets should be discontinued as soon

The use of drugs that act directly on the renin-angiotensin system during the second and third trimesters of pregnancy has been associated with fetal and neonatal injury, including hypotension, neonatal skull hypoplasia, anuria, reversible or irreversible renal failure, and death. Oligohydramnios has also been reported, presumably resulting from decreased fetal renal function of the second statement of the second secon

n; oligohydramnios in this setting has been associated with fetal limb contractures, craniofa cial deformation, and hypoplastic lung development. Prematurity, intrauterine growth retarda tion, and patent ductus arteriosus have also been reported, although it is not clear whether nces were due to exposure to the drug.

These adverse effects do not appear to have resulted from intrauterine drug exposure that has been limited to the first trimester. Mothers whose embryos and fetuses are exposed to an angiotensin II receptor antagonist only during the first trimester should be so informed. theless, when patients become pregnant, physicians should have the patient discontinu the use of MICARDIS tablets as soon as possible.

Rarely (probably less often than once in every thousand pregnancies), no alternative to an angiotensin II receptor antagonist will be found. In these rare cases, the mothers should be apprised of the potential hazards to their fetuses, and serial ultrasound examinations should performed to assess the intra-amniotic environment.

If oligohydramnios is observed, MICARDIS tablets should be discontinued unless they are con sidered life-saving for the mother. Contraction stress testing (CST), a non-stress test (NST), or biophysical profiling (BPP) may be appropriate, depending upon the week of pregnancy. Patients and physicians should be aware, however, that oligohydramnios may not appear until after the fetus has sustained irreversible injury.

Infants with histories of in utero exposure to an angiotensin II receptor antagonist should be closely observed for hypotension, oliguria, and hyperkalemia. If oliguria occurs, attention should be directed toward support of blood pressure and renal perfusion. Exchange transfusion or dialysis may be required as a means of reversing hypotension and/or substituting for disordered renal function.

There is no clinical experience with the use of MICARDIS tablets in pregnant women. No ter-atogenic effects were observed when telmisartan was administered to pregnant rats at oral doses of up to 50 mg/kg/day and to pregnant rabbits at oral doses up to 45 mg/kg/day. In rab-bits, embryolethality associated with maternal toxicity (reduced body weight gain and food consumption) was observed at 45 mg/kg/day [about 12 times the maximum recommended consumption) was observed at 45 mg/kg/day [about 12 times the maximum recommended human dose (MRHD) of 80 mg on a mg/m² basis]. In rats, maternally toxic (reduction in body weight gain and food consumption) telmisartan doses of 15 mg/kg/day (about 1.9 times the MRHD on a mg/m² basis), administered during late gestation and lactation, were observed to produce adverse effects in neonates, including reduced viability, low birth weight, delayed mat-uration, and decreased weight gain. Telmisartan has been shown to be present in rat fetuses during late gestation and in rat milk. The no observed effect doses for developmental toxicity in rats and rabbits, 5 and 15 mg/kg/day, respectively, are about 0.64 and 3.7 times, on a mg/m² basis, the maximum recommended human dose of telmisartan 80 mg/day). nded human dose of telmisartan (80 mg/day) basis, the maximu

25 mm

340194/US/3

2 mm

10 mm

Hypotension in Volume-Depleted Patients supervision with a reduced dose.

10 mm

PRECAUTIONS

may be anticipated in patients treated with MICARDIS tablets.

Information for Patients

report pregnancies to their physicians as soon as possible

Drug Interactions Digoxin: When telmisartan was coa telmisartan to avoid possible over- or under-digitalization

cinogenesis, Mutagenesis, Impairment of Fertility

lymphocytes, and a mouse micronucleus test.

Pregnancy

Nursing Mothers

Pediatric Use

Geriatric Use

ADVERSE REACTIONS

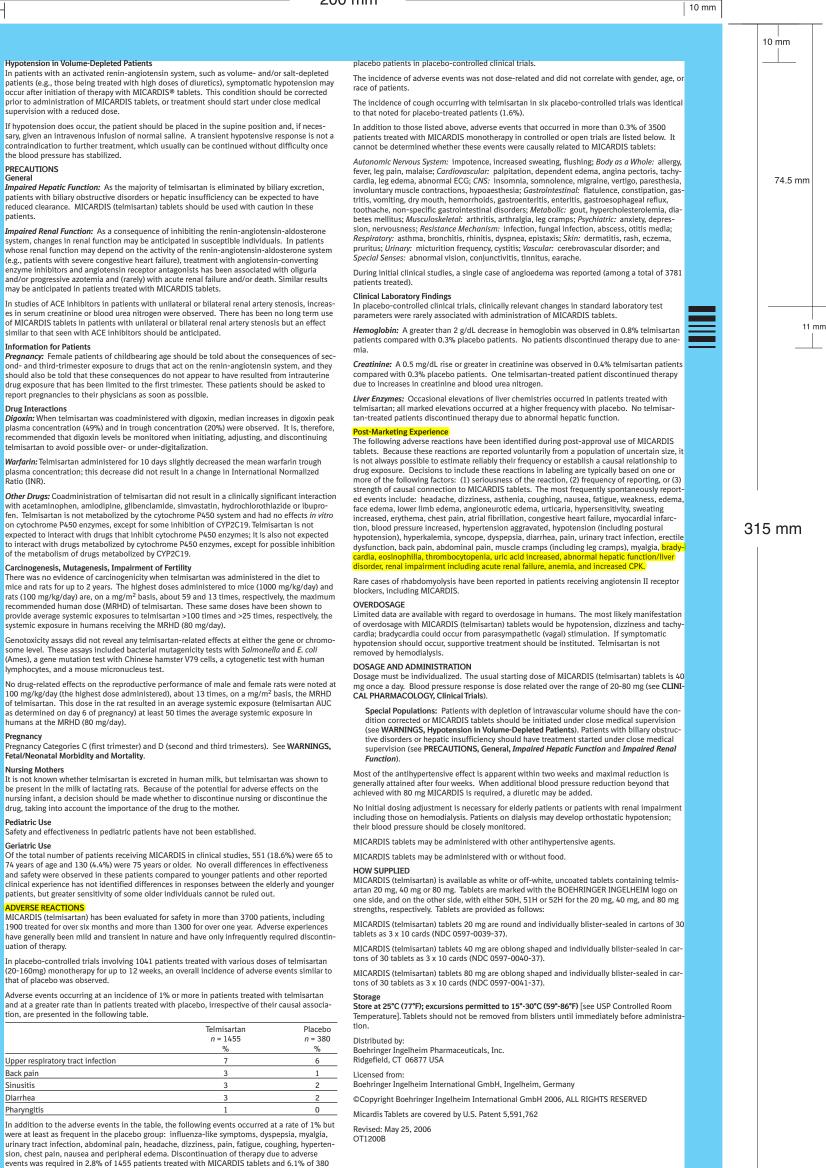
uation of therapy.

Upper respiratory tract infection
Back pain
Sinusitis
Diarrhea
Pharyngitis
In addition to the adverse events were at least as frequent in the p urinary tract infection, abdomina sion, chest pain, nausea and per events was required in 2.8% of 1

FRONT PANEL

11 mm

74.5 mm



340194/US/3

BACK PANEL