

## CO-OLESTA

(Olmesartan Medoxomil U.S.P. + Hydrochlorothiazide B.P.)

20 mg/12.5 mg & 40mg/12.5 mg

Tablets

### WARNING

#### FETAL TOXICITY

- When pregnancy is detected, discontinue Olmesartan medoxomil/Hydrochlorothiazide combination as soon as possible
- Drugs that act directly on the renin-angiotensin system can cause injury and death to the developing fetus

### COMPOSITION

#### Co-Olesta 20 mg/12.5 mg

Each film-coated tablet contains:

Olmesartan Medoxomil U.S.P. 20mg + Hydrochlorothiazide B.P. 12.5mg

#### Co-Olesta 40 mg/12.5 mg

Each film-coated tablet contains:

Olmesartan Medoxomil U.S.P. 40mg + Hydrochlorothiazide B.P. 12.5mg

### THERAPEUTIC INDICATIONS

Treatment of essential hypertension.

Olmesartan medoxomil and Hydrochlorothiazide fixed dose combination is indicated in adult patients whose blood pressure is not adequately controlled on Olmesartan alone.

### DOSAGE AND ADMINISTRATION

#### Adults

The recommended dose of Combination of Olmesartan medoxomil & Hydrochlorothiazide is 1 tablet per day.

Combination of Olmesartan medoxomil & Hydrochlorothiazide 20mg/12.5 & 40 mg/12.5 mg may be administered in patients whose blood pressure is not adequately controlled by olmesartan medoxomil alone.

For convenience, patients receiving olmesartan medoxomil and hydrochlorothiazide from separate tablets may be switched to Combination of Olmesartan medoxomil & Hydrochlorothiazide tablets containing the same component doses.

Combination of Olmesartan medoxomil & Hydrochlorothiazide can be taken with or without food.

#### Elderly (age 65 years or over)

In elderly people the same dosage of the combination is recommended as for adults.

Blood pressure should be closely monitored.

#### Renal impairment

Combination of Olmesartan medoxomil & Hydrochlorothiazide is contraindicated in patients with severe renal impairment (creatinine clearance < 30 mL/min).

The maximum dose of olmesartan medoxomil in patients with mild to moderate renal impairment (creatinine clearance of 30 – 60 mL/min) is 20 mg olmesartan medoxomil once daily, owing to limited experience of higher dosages in this patient group, and periodic monitoring is advised.

Combination of Olmesartan medoxomil & Hydrochlorothiazide 40 mg/12.5 mg is therefore contraindicated in all stages of renal impairment.

#### Hepatic impairment

Combination of Olmesartan medoxomil & Hydrochlorothiazide 40 mg/12.5 mg should be used with caution in patients with mild hepatic impairment. Close monitoring of blood pressure and renal function is advised in hepatically-impaired patients who are receiving diuretics and/or other antihypertensive agents. In patients with moderate hepatic impairment, an initial dose of 10 mg olmesartan medoxomil once daily is recommended and the maximum dose should not exceed 20 mg once daily. There is no experience of olmesartan medoxomil in patients with severe hepatic impairment. Combination of Olmesartan medoxomil & Hydrochlorothiazide 40 mg/12.5 mg therefore should not be used in patients with moderate and severe hepatic impairment, as well as in cholestasis and biliary obstruction.

#### Paediatric population

The safety and efficacy of Combination of Olmesartan medoxomil & Hydrochlorothiazide 40 mg/12.5 mg in children and adolescents below 18 years has not been established. No data are available.

### Method of administration

The tablet should be swallowed with a sufficient amount of fluid (e.g., one glass of water). The tablet should not be chewed and should be taken at the same time each day.

### CONTRA-INDICATIONS

Hypersensitivity to the active substances, to any of the excipients or to other sulfonamide-derived substances (since hydrochlorothiazide is a sulfonamide-derived medicinal product).

Renal impairment.

Refractory hypokalemia, hypercalcemia, hyponatremia and symptomatic hyperuricaemia.

Moderate and severe hepatic impairment, cholestasis and biliary obstructive disorders

2nd and 3rd trimester of pregnancy

The concomitant use of combination of Olmesartan medoxomil & Hydrochlorothiazide with aliskiren-containing products is contraindicated in patients with diabetes mellitus or renal impairment (GFR < 60 mL/min/1.73 m<sup>2</sup>)

### WARNING

#### Intravascular volume depletion:

Symptomatic hypotension, especially after the first dose, may occur in patients who are volume and/or sodium depleted by vigorous diuretic therapy, dietary salt restriction, diarrhoea or vomiting. Such conditions should be corrected before the administration of Combination of Olmesartan medoxomil & Hydrochlorothiazide.

#### Other conditions with stimulation of the renin-angiotensin-aldosterone system:

In patients whose vascular tone and renal function depend predominantly on the activity of the renin-angiotensin-aldosterone system (e.g., patients with severe congestive heart failure or underlying renal disease, including renal artery stenosis), treatment with medicinal products that affect this system has been associated with acute hypotension, azotemia, oliguria or, rarely, acute renal failure.

#### Renovascular hypertension:

There is an increased risk of severe hypotension and renal insufficiency when patients with bilateral renal artery stenosis or stenosis of the artery to a single functioning kidney are treated with medicinal products that affect the renin-angiotensin-aldosterone system.

#### Renal impairment and kidney transplantation:

Combination of Olmesartan medoxomil & Hydrochlorothiazide should not be used in patients with severe renal impairment (creatinine clearance < 30 mL/min).

The maximum dose of olmesartan medoxomil in patients with mild to moderate renal impairment (creatinine clearance of 30 – 60 mL/min) is 20 mg olmesartan medoxomil once daily. However, in such patients Combination of Olmesartan medoxomil & Hydrochlorothiazide 20 mg/12.5 mg should be administered with caution and periodic monitoring of serum potassium, creatinine and uric acid levels is recommended. Thiazide diuretic-associated azotemia may occur in patients with impaired renal function. If progressive renal impairment becomes evident, careful reappraisal of therapy is necessary, with consideration given to discontinuing diuretic therapy.

Combination of Olmesartan medoxomil & Hydrochlorothiazide 40 mg/12.5 mg is therefore contraindicated in all stages of renal impairment.

There is no experience of the administration of Combination of Olmesartan medoxomil & Hydrochlorothiazide in patients with a recent kidney transplantation.

#### Dual blockade of the renin-angiotensin-aldosterone system (RAAS):

There is evidence that the concomitant use of ACE-inhibitors, angiotensin II receptor blockers or aliskiren increases the risk of hypotension, hyperkalaemia and decreased renal function (including acute renal failure).

Dual blockade of RAAS through the combined use of ACE-inhibitors, angiotensin II receptor blockers or aliskiren is therefore not recommended

If dual blockade therapy is considered absolutely necessary, this should only occur under specialist supervision and subject to frequent close monitoring of renal function, electrolytes and blood pressure.

ACE-inhibitors and angiotensin II receptor blockers should not be used concomitantly in patients with diabetic nephropathy.

#### **Hepatic impairment:**

There is currently no experience of olmesartan medoxomil in patients with severe hepatic impairment. In patients with moderate hepatic impairment, the maximum dose is 20 mg olmesartan medoxomil.

Furthermore, minor alterations of fluid and electrolyte balance during thiazide therapy may precipitate hepatic coma in patients with impaired hepatic function or progressive liver disease.

Therefore, the use of Combination of Olmesartan medoxomil & Hydrochlorothiazide 40 mg/12.5 mg in patients with moderate and severe hepatic impairment, cholestasis and biliary obstruction is contraindicated. Care should be taken in patients with mild impairment

#### **Aortic and mitral valve stenosis, obstructive hypertrophic cardiomyopathy:**

As with other vasodilators, special caution is indicated in patients suffering from aortic or mitral stenosis, or obstructive hypertrophic cardiomyopathy.

#### **Primary aldosteronism:**

Patients with primary aldosteronism generally will not respond to anti-hypertensive medicinal products acting through inhibition of the renin-angiotensin system. Therefore, the use of Combination of Olmesartan medoxomil & Hydrochlorothiazide is not recommended in such patients.

#### **Metabolic and endocrine effects:**

Thiazide therapy may impair glucose tolerance. In diabetic patients' dosage adjustments of insulin or oral hypoglycemic agents may be required. Latent diabetes mellitus may become manifest during thiazide therapy.

Increases in cholesterol and triglyceride levels are undesirable effects known to be associated with thiazide diuretic therapy.

Hyperuricaemia may occur or frank gout may be precipitated in some patients receiving thiazide therapy.

#### **Electrolyte imbalance:**

As for any patient receiving diuretic therapy, periodic determination of serum electrolytes should be performed at appropriate intervals.

Thiazides, including hydrochlorothiazide, can cause fluid or electrolyte imbalance (including hypokalemia, hyponatremia and hypochloremia alkalosis). Warning signs of fluid or electrolyte imbalance are dryness of the mouth, thirst, weakness, lethargy, drowsiness, restlessness, muscle pain or cramps, muscular fatigue, hypotension, oliguria, tachycardia, and gastrointestinal disturbances such as nausea or vomiting.

The risk of hypokalemia is greatest in patients with cirrhosis of the liver, in patients experiencing brisk diuresis, in patients who are receiving inadequate oral intake of electrolytes and in patients receiving concomitant therapy with corticosteroids or ACTH.

Conversely, due to antagonism at the angiotensin-II receptors (AT<sub>1</sub>) through the olmesartan medoxomil component of Combination of Olmesartan medoxomil & Hydrochlorothiazide hyperkalemia may occur, especially in the presence of renal impairment and/or heart failure, and diabetes mellitus. Adequate monitoring of serum potassium in patients at risk is recommended. Potassium-sparing diuretics, potassium supplements or potassium-containing salt substitutes and other medicinal products that may increase serum potassium levels (e.g., heparin) should be co-administered cautiously with Combination of Olmesartan medoxomil & Hydrochlorothiazide.

There is no evidence that olmesartan medoxomil would reduce or prevent diuretic-induced hyponatremia. Chloride deficit is generally mild and usually does not require treatment.

Thiazides may decrease urinary calcium excretion and cause an intermittent and slight elevation of serum calcium in the absence of known disorders of calcium metabolism. Hypercalcemia may be evidence of hidden hyperparathyroidism. Thiazides should be discontinued before carrying out tests for parathyroid function.

Thiazides have been shown to increase the urinary excretion of magnesium, which may result in hypomagnesaemia.

Dilutional hyponatremia may occur in edematous patients in hot weather.

#### **Lithium:**

As with other angiotensin II receptor antagonists, the coadministration of Combination of Olmesartan medoxomil & Hydrochlorothiazide and lithium is not recommended.

#### **Sprue-like enteropathy:**

In very rare cases severe, chronic diarrhoea with substantial weight loss has been reported in patients taking olmesartan few months to years after drug initiation, possibly caused by a localized delayed hypersensitivity reaction. Intestinal biopsies of patients often demonstrated villous atrophy. If a patient develops these symptoms during treatment with olmesartan, and in the absence of other apparent etiologies, olmesartan treatment should be immediately discontinued and should not be restarted. If diarrhoea does not improve during the week after the discontinuation, further specialist (e.g., a gastro-enterologist) advice should be considered.

#### **Choroidal Effusion, Acute Myopia and Secondary Angle-Closure Glaucoma:**

Hydrochlorothiazide, a sulfonamide, can cause an idiosyncratic reaction, resulting in choroidal effusion with visual field defect, acute transient myopia and acute angle-closure glaucoma. Symptoms include acute onset of decreased visual acuity or ocular pain and typically occur within hours to weeks of drug initiation. Untreated acute angle-closure glaucoma can lead to permanent vision loss. The primary treatment is to discontinue hydrochlorothiazide as rapidly as possible. Prompt medical or surgical treatments may need to be considered if the intraocular pressure remains uncontrolled. Risk factors for developing acute angle-closure glaucoma may include a history of sulfonamide or penicillin allergy.

#### **Non-melanoma skin cancer:**

An increased risk of non-melanoma skin cancer (NMSC) [basal cell carcinoma (BCC) and squamous cell carcinoma (SCC)] with increasing cumulative dose of hydrochlorothiazide (HCTZ) exposure has been observed in two epidemiological studies based on the Danish National Cancer Registry. Photosensitizing actions of HCTZ could act as a possible mechanism for NMSC.

Patients taking HCTZ should be informed of the risk of NMSC and advised to regularly check their skin for any new lesions and promptly report any suspicious skin lesions. Possible preventive measures such as limited exposure to sunlight and UV rays and, in case of exposure, adequate protection should be advised to the patients in order to minimize the risk of skin cancer. Suspicious skin lesions should be promptly examined potentially including histological examinations of biopsies. The use of HCTZ may also need to be reconsidered in patients who have experienced previous NMSC.

#### **Ethnic differences:**

As with all other angiotensin II receptor antagonist containing products, the blood pressure lowering effect of Combination of Olmesartan medoxomil & Hydrochlorothiazide is somewhat less in black patients than in non-black patients, possibly because of a higher prevalence of low-renin status in the black hypertensive population.

#### **Anti-doping test:**

Hydrochlorothiazide contained in this medicinal product could produce a positive analytic result in an anti-doping test.

#### **Other:**

As with any antihypertensive agent, excessive blood pressure decrease in patients with ischemic heart disease or ischemic cerebrovascular disease could result in a myocardial infarction or stroke.

Hypersensitivity reactions to hydrochlorothiazide may occur in patients with or without a history of allergy or bronchial asthma, but are more likely in patients with such a history.

Exacerbation or activation of systemic lupus erythematosus has been reported with the use of thiazide diuretics.

This medicinal product contains lactose. Patients with rare hereditary problems of galactose intolerance, the Lapp-lactase deficiency or glucose-galactose malabsorption should not take this medicinal product.

## DRUG INTERACTIONS

### Potential interactions related to the Combination of Olmesartan medoxomil & Hydrochlorothiazide combination:

#### Concomitant use not recommended

##### Lithium:

Reversible increases in serum lithium concentrations and toxicity have been reported during concomitant administration of lithium with angiotensin converting enzyme inhibitors and, rarely, with angiotensin II receptor antagonists. In addition, renal clearance of lithium is reduced by thiazides and consequently the risk of lithium toxicity may be increased. Therefore, use of Combination of Olmesartan medoxomil & Hydrochlorothiazide and lithium in combination is not recommended. If use of the combination proves necessary, careful monitoring of serum lithium levels is recommended.

#### Concomitant use requiring caution

##### Baclofen:

Potential of antihypertensive effect may occur.

##### Non-steroidal anti-inflammatory medicinal products:

NSAIDs (i.e., acetylsalicylic acid (> 3 g/day), COX-2 inhibitors and non-selective NSAIDs) may reduce the antihypertensive effect of thiazide diuretics and angiotensin II receptor antagonists.

In some patients with compromised renal function (e.g., dehydrated patients or elderly people with compromised renal function) the co-administration of angiotensin II receptor antagonists and agents that inhibit cyclo-oxygenase may result in further deterioration of renal function, including possible acute renal failure, which is usually reversible. Therefore, the combination should be administered with caution, especially in elderly people. Patients should be adequately hydrated and consideration should be given to monitoring of renal function after initiation of concomitant therapy and periodically thereafter.

#### Concomitant use to be taken into account

##### Amifostine:

Potential of antihypertensive effect may occur.

##### Other antihypertensive agents:

The blood pressure lowering effect of Combination of Olmesartan medoxomil & Hydrochlorothiazide can be increased by concomitant use of other antihypertensive medicinal products.

##### Alcohol, barbiturates, narcotics or antidepressants:

Potential of orthostatic hypotension may occur.

### Potential interactions related to olmesartan medoxomil:

#### Concomitant use not recommended

##### ACE-inhibitors, angiotensin II receptor blockers or aliskiren:

Clinical trial data has shown that dual blockade of the renin-angiotensin-aldosterone-system (RAAS) through the combined use of ACE-inhibitors, angiotensin II receptor blockers or aliskiren is associated with a higher frequency of adverse events such as hypotension, hyperkalaemia and decreased renal function (including acute renal failure) compared to the use of a single RAAS-acting agent.

### Medicinal products affecting potassium levels:

Based on experience with the use of other medicinal products that affect the renin-angiotensin system, concomitant use of potassium-sparing diuretics, potassium supplements, salt substitutes containing potassium or other medicinal products that may increase serum potassium levels (e.g., heparin, ACE inhibitors) may lead to increases in serum potassium. If medicinal products which affect potassium levels are to be prescribed in combination with Combination of Olmesartan medoxomil & Hydrochlorothiazide, monitoring of potassium plasma levels is advised.

### Bile acid sequestering agent colesevelam:

Concurrent administration of the bile acid sequestering agent colesevelam hydrochloride reduces the systemic exposure and peak plasma concentration of olmesartan and reduces t<sub>1/2</sub>. Administration of olmesartan medoxomil at least 4 hours prior to colesevelam hydrochloride decreased the drug interaction effect. Administering olmesartan medoxomil at least 4 hours before the colesevelam hydrochloride dose should be considered.

### Additional information

After treatment with antacid (aluminium magnesium hydroxide), a modest reduction in bioavailability of olmesartan was observed.

Olmesartan medoxomil had no significant effect on the pharmacokinetics or pharmacodynamics of warfarin or the pharmacokinetics of digoxin.

Coadministration of olmesartan medoxomil with pravastatin had no clinically relevant effects on the pharmacokinetics of either component in healthy subjects.

Olmesartan had no clinically relevant inhibitory effects on human cytochrome P450 enzymes 1A1/2, 2A6, 2C8/9, 2C19, 2D6, 2E1 and 3A4 *in vitro*, and had no or minimal inducing effects on rat cytochrome P450 activities. No clinically relevant interactions between olmesartan and medicinal products metabolized by the above cytochrome P450 enzymes are expected.

### Potential interactions related to hydrochlorothiazide:

#### Concomitant use not recommended

### Medicinal products affecting potassium levels:

The potassium-depleting effect of hydrochlorothiazide may be potentiated by the coadministration of other medicinal products associated with potassium loss and hypokalemia (e.g., other kaliuretic diuretics, laxatives, corticosteroids, ACTH, amphotericin, carbenoxolone, penicillin G sodium or salicylic acid derivatives). Such concomitant use is therefore not recommended.

#### Concomitant use requiring caution

##### Calcium salts:

Thiazide diuretics may increase serum calcium levels due to decreased excretion. If calcium supplements must be prescribed, serum calcium levels should be monitored and calcium dosage adjusted accordingly.

##### Cholestyramine and colestipol resins:

Absorption of hydrochlorothiazide is impaired in the presence of anionic exchange resins.

##### Digitalis glycosides:

Thiazide-induced hypokalemia or hypomagnesaemia may favor the onset of digitalis-induced cardiac arrhythmias.

### Medicinal products affected by serum potassium disturbances:

Periodic monitoring of serum potassium and ECG is recommended when Combination of Olmesartan medoxomil & Hydrochlorothiazide is administered with medicinal products affected by serum potassium disturbances (e.g., digitalis glycosides and antiarrhythmics) and with the following torsades de pointes (ventricular tachycardia)-inducing medicinal products (including some antiarrhythmics), hypokalemia being a predisposing factor to torsades de pointes (ventricular tachycardia):

- Class Ia antiarrhythmics (e.g. quinidine, hydroquinidine, disopyramide).

- Class III antiarrhythmics (e.g. amiodarone, sotalol, dofetilide, ibutilide).
- Some antipsychotics (e.g. thioridazine, chlorpromazine, levomepromazine, trifluoperazine, cyamemazine, sulpiride, sultopride, amisulpride, tiapride, pimozide, haloperidol, droperidol).
- Others (e.g. bepridil, cisapride, diphemanil, erythromycin IV, halofantrin, mizolastin, pentamidine, sparfloracin, terfenadine, vincamine IV).

*Non-depolarizing skeletal muscle relaxants (e.g. tubocurarine):*

The effect of nondepolarizing skeletal muscle relaxants may be potentiated by hydrochlorothiazide.

*Anticholinergic agents (e.g. atropine, biperiden):*

Increase of the bioavailability of thiazide-type diuretics by decreasing gastrointestinal motility and stomach emptying rate.

*Antidiabetic medicinal products (oral agents and insulin):*

The treatment with a thiazide may influence the glucose tolerance. Dosage adjustment of the antidiabetic medicinal product may be required.

*Metformin:*

Metformin should be used with caution because of the risk of lactic acidosis induced by possible functional renal failure linked to hydrochlorothiazide.

*Beta-blockers and diazoxide:*

The hyperglycaemic effect of beta-blockers and diazoxide may be enhanced by thiazides.

*Pressor amines (e.g. noradrenaline):*

The effect of pressor amines may be decreased.

*Medicinal products used in the treatment of gout (e.g., probenecid, sulfipyrazone and allopurinol):*

Dosage adjustment of uricosuric medicinal products may be necessary since hydrochlorothiazide may raise the level of serum uric acid. Increase in dosage of probenecid or sulfipyrazone may be necessary. Coadministration of a thiazide may increase the incidence of hypersensitivity reactions to allopurinol.

*Amantadine:*

Thiazides may increase the risk of adverse effects caused by amantadine.

*Cytotoxic agents (e.g., cyclophosphamide, methotrexate):*

Thiazides may reduce the renal excretion of cytotoxic medicinal products and potentiate their myelosuppressive effects.

*Salicylates:*

In case of high dosages of salicylates hydrochlorothiazide may enhance the toxic effect of the salicylates on the central nervous system.

*Methylodopa:*

There have been isolated reports of haemolytic anemia occurring with concomitant use of hydrochlorothiazide and methylodopa.

*Cyclosporine:*

Concomitant treatment with cyclosporine may increase the risk of hyperuricaemia and gout-type complications.

*Tetracyclines:*

Concomitant administration of tetracyclines and thiazides increases the risk of tetracycline-induced increase in urea. This interaction is probably not applicable to doxycycline.

**FERTILITY, PREGNANCY AND LACTATION**

**Pregnancy**

Given the effects of the individual components in this combination product on pregnancy, the use of Combination of Olmesartan medoxomil & Hydrochlorothiazide is not recommended during the first trimester of pregnancy. The use of Combination of Olmesartan medoxomil & Hydrochlorothiazide is contra-indicated during the 2nd and 3rd trimester of pregnancy.

*Olmesartan medoxomil:*

The use of angiotensin II receptor antagonists is not recommended during the first trimester of pregnancy. The use of angiotensin II receptor antagonists is contra-indicated during the 2nd and 3rd trimester of pregnancy.

Epidemiological evidence regarding the risk of teratogenicity following exposure to ACE inhibitors during the first trimester of pregnancy has not been conclusive; however, a small increase in risk cannot be excluded. Whilst there is no controlled epidemiological data on the risk with angiotensin II receptor antagonists, similar risks may exist for this class of drugs. Unless continued angiotensin receptor blocker therapy is considered essential, patients planning pregnancy should be changed to alternative anti-hypertensive treatments which have an established safety profile for use in pregnancy. When pregnancy is diagnosed, treatment with angiotensin II receptor antagonists should be stopped immediately, and, if appropriate, alternative therapy should be started.

Exposure to angiotensin II receptor antagonists' therapy during the 2nd and 3rd trimesters is known to induce human fetotoxicity (decreased renal function, oligohydramnios, skull ossification retardation) and neonatal toxicity (renal failure, hypotension, hyperkalaemia).

Should exposure to angiotensin II receptor antagonists have occurred from the 2nd trimester of pregnancy, ultrasound check of renal function and skull is recommended.

Infants whose mothers have taken angiotensin II receptor antagonists should be closely observed for hypotension.

*Hydrochlorothiazide:*

There is limited experience with hydrochlorothiazide during pregnancy, especially during the first trimester. Animal studies are insufficient.

Hydrochlorothiazide crosses the placenta. Based on the pharmacological mechanism of action of hydrochlorothiazide its use during the 2nd and 3rd trimester may compromise foeto-placental perfusion and may cause foetal and neonatal effects like icterus, disturbance of electrolyte balance and thrombocytopenia.

Hydrochlorothiazide should not be used for gestational oedema, gestational hypertension or pre-eclampsia due to the risk of decreased plasma volume and placental hypoperfusion, without a beneficial effect on the course of the disease.

Hydrochlorothiazide should not be used for essential hypertension in pregnant women except in rare situations where no other treatment could be used.

**Breast-feeding**

*Olmesartan medoxomil:*

Because no information is available regarding the use of Combination of Olmesartan medoxomil & Hydrochlorothiazide during breast-feeding, Combination of Olmesartan medoxomil & Hydrochlorothiazide is not recommended and alternative treatments with better established safety profiles during breast-feeding are preferable, especially while nursing a newborn or preterm infant.

*Hydrochlorothiazide:*

Hydrochlorothiazide is excreted in human milk in small amounts. Thiazides in high doses causing intense diuresis can inhibit the milk production. The use of Combination of Olmesartan medoxomil & Hydrochlorothiazide during breast-feeding is not recommended. If Combination of Olmesartan medoxomil & Hydrochlorothiazide is used during breast-feeding, doses should be kept as low as possible.

**EFFECTS ON ABILITY TO DRIVE**

Olmesartan medoxomil & Hydrochlorothiazide combination has minor or moderate influence on the ability to drive and use machines. Dizziness or fatigue may occasionally occur in patients taking antihypertensive therapy, which may impair the ability to react.

### ADVERSE DRUG REACTIONS

The most commonly reported adverse reactions during treatment with Combination of Olmesartan medoxomil & Hydrochlorothiazide are headache (2.9%), dizziness (1.9%) and fatigue (1.0%).

Hydrochlorothiazide may cause or exacerbate volume depletion which may lead to electrolyte imbalance.

The safety of Combination of Olmesartan medoxomil & Hydrochlorothiazide was investigated in clinical trials in 3709 patients receiving olmesartan medoxomil in combination with hydrochlorothiazide.

Further adverse reactions reported with the fixed dose combination of olmesartan medoxomil and hydrochlorothiazide in the lower dose strengths 20 mg/12.5 mg may be potential adverse reactions with Combination of Olmesartan medoxomil & Hydrochlorothiazide 40 mg/12.5 mg.

Adverse reactions from Combination of Olmesartan medoxomil & Hydrochlorothiazide in clinical trials, post-authorization safety studies and spontaneous reporting are summarized in the below table as well as adverse reactions from the individual components olmesartan medoxomil and hydrochlorothiazide based on the known safety profile of these substances.

The following terminologies have been used in order to classify the occurrence of adverse reactions: very common ( $\geq 1/10$ ); common ( $\geq 1/100$  to  $< 1/10$ ); uncommon ( $\geq 1/1000$  to  $< 1/100$ ); rare ( $\geq 1/10000$  to  $< 1/1000$ ); very rare ( $< 1/10000$ ), not known (cannot be estimated from the available data).

MedDRA	Adverse reactions	Frequency		
System Organ Class		Combination of Olmesartan medoxomil & Hydrochlorothiazide	Olmesartan	HCTZ
Infections and infestations	Sialadenitis			Rare
Neoplasms benign, malignant and unspecified (incl cysts and polyps)	Non-melanoma skin cancer (Basal cell carcinoma and Squamous cell carcinoma)			Not known
Blood and lymphatic system disorders	Aplastic anemia			Rare
	Bone marrow depression			Rare
	Haemolytic anemia			Rare
	Leukopenia			Rare
	Neutropenia/Agranulocytosis			Rare
	Thrombocytopenia		Uncommon	Rare

Immune system disorders	Anaphylactic reactions		Uncommon	Uncommon
Metabolism and nutrition disorders	Anorexia			Uncommon
	Glycosuria			Common
	Hypercalcemia			Common
	Hypercholesterolemia	Uncommon		Very common
	Hyperglycemia			Common
	Hyperkalaemia		Rare	
	Hypertriglyceridaemia	Uncommon	Common	Very common
	Hyperuricaemia	Uncommon	Common	Very common
	Hypochloremia			Common
	Hypochloremia alkalosis			Very rare
	Hypokalaemia			Common
	Hypomagnesaemia			Common
	Hyponatremia			Common
Hyperamylasemia			Common	
Psychiatric disorders	Apathy			Rare
	Depression			Rare
	Restlessness			Rare
	Sleep disturbances			Rare
Nervous system disorders	Confusional state			Common
	Convulsions			Rare
	Disturbances in consciousness (such as loss of consciousness)	Rare		
	Dizziness/light-headedness	Common	Common	Common
	Headache	Common	Common	Rare
	Loss of appetite			Uncommon
	Paraesthesia			Rare
	Postural dizziness	Uncommon		
	Somnolence	Uncommon		

	Syncope	Uncommon		
Eye disorders	Lacrimation decreased			Rare
	Transient blurred vision			Rare
	Worsening of pre-existing myopia			Uncommon
	Acute myopia, acute angle-closure glaucoma			Not known
	Choroidal effusion			Not known
	Xanthopsia			Rare
	Ear and labyrinth disorders	Vertigo	Uncommon	Uncommon
Cardiac disorders	Angina pectoris		Uncommon	
	Cardiac arrhythmias			Rare
	Palpitations	Uncommon		
Vascular disorders	Embolism			Rare
	Hypotension	Uncommon	Rare	
	Necrotizing angiitis (vasculitis, cutaneous vasculitis)			Rare
	Orthostatic hypotension	Uncommon		Uncommon
	Thrombosis			Rare
Respiratory, thoracic and mediastinal disorders	Bronchitis		Common	
	Cough	Uncommon	Common	
	Dyspnea			Rare
	Interstitial pneumonia			Rare
	Pharyngitis		Common	
	Pulmonary oedema			Rare
	Respiratory distress			Uncommon
	Rhinitis		Common	
Gastrointestinal disorders	Abdominal pain	Uncommon	Common	Common
	Constipation			Common

	Diarrhoea	Uncommon	Common	Common
	Dyspepsia	Uncommon	Common	
	Gastric irritation			Common
	Gastroenteritis		Common	
	Meteorism			Common
	Nausea	Uncommon	Common	Common
	Pancreatitis			Rare
	Paralytic ileus			Very rare
	Vomiting	Uncommon	Uncommon	Common
	Sprue-like enteropathy			Very rare
Hepato-biliary disorders	Acute cholecystitis			Rare
	Jaundice (intrahepatic cholestasis icterus)			Rare
Skin and subcutaneous tissue disorders	Allergic dermatitis		Uncommon	
	Anaphylactic skin reactions			Rare
	Angioneurotic oedema	Rare	Rare	
	Cutaneous lupus erythematoses-like reactions			Rare
	Eczema	Uncommon		
	Erythema			Uncommon
	Exanthem		Uncommon	
	Photosensitivity reactions			Uncommon
	Pruritus		Uncommon	Uncommon
	Purpura			Uncommon
	Rash	Uncommon	Uncommon	Uncommon
	Reactivation of cutaneous lupus erythematoses			Rare
	Toxic epidermal necrolysis			Rare

	Urticaria	Rare	Uncommon	Uncommon
Musculoskeletal and connective tissue disorders	Arthralgia	Uncommon		
	Arthritis		Common	
	Back pain	Uncommon	Common	
	Muscle spasm	Uncommon	Rare	
	Muscular weakness			Rare
	Myalgia	Uncommon	Uncommon	
	Pain in extremity	Uncommon		
	Paresis			Rare
	Skeletal pain		Common	
Renal and urinary disorders	Acute renal failure	Rare	Rare	
	Hematuria	Uncommon	Common	
	Interstitial nephritis			Rare
	Renal insufficiency		Rare	
	Renal dysfunction			Rare
	Urinary tract infection		Common	
Reproductive system and breast disorders	Erectile dysfunction	Uncommon		Uncommon
General disorders and administration site conditions	Asthenia	Common	Uncommon	
	Chest pain	Common	Common	
	Face oedema		Uncommon	
	Fatigue	Common	Common	
	Fever			Rare
	Influenza-like symptoms		Common	
	Lethargy		Rare	
	Malaise	Rare	Uncommon	
	Pain		Common	
	Peripheral oedema	Common	Common	
	Weakness	Uncommon		

Investigations	Alanine aminotransferase increased	Uncommon		
	Aspartate aminotransferase increased	Uncommon		
	Blood calcium increased	Uncommon		
	Blood creatinine increased	Uncommon	Rare	Common
	Blood creatine phosphokinase increased		Common	
	Blood glucose increased	Uncommon		
	Blood hematocrit decreased	Rare		
	Blood hemoglobin decreased	Rare		
	Blood lipids increased	Uncommon		
	Blood potassium decreased	Uncommon		
	Blood potassium increased	Uncommon		
	Blood urea increased	Uncommon	Common	Common
	Blood urea nitrogen increased	Rare		
	Blood uric acid increased	Rare		
	Gamma glutamyl transferase increased	Uncommon		
	Hepatic enzymes increased		Common	

Single cases of rhabdomyolysis have been reported in temporal association with the intake of angiotensin II receptor blockers.

Non-melanoma skin cancer: Based on available data from epidemiological studies, cumulative dose-dependent association between HCTZ and NMSC has been observed.

#### **Reporting of suspected adverse reactions**

Reporting suspected adverse reactions after authorization of the medicinal product is important. It allows continued monitoring of the benefit/risk balance of the medicinal product. Healthcare professionals are asked to report any suspected adverse reactions via [pv@searlecompany.com](mailto:pv@searlecompany.com).

#### **OVERDOSE**

No specific information is available on the effects or treatment of Combination of Olmesartan medoxomil & Hydrochlorothiazide overdose. The patient should be closely monitored, and the treatment should be symptomatic and supportive. Management depends upon the time since ingestion and the severity of the symptoms. Suggested measures include induction of emesis

and/or gastric lavage. Activated charcoal may be useful in the treatment of overdose. Serum electrolytes and creatinine should be monitored frequently. If hypotension occurs, the patient should be placed in a supine position, with salt and volume replacements given quickly.

The most likely manifestations of olmesartan medoxomil overdose are expected to be hypotension and tachycardia; bradycardia might also occur. Overdose with hydrochlorothiazide is associated with electrolyte depletion (hypokalemia, hyponatremia) and dehydration resulting from excessive diuresis. The most common signs and symptoms of overdose are nausea and somnolence. Hypokalaemia may result in muscle spasm and/or accentuate cardiac arrhythmias associated with the concomitant use of digitalis glycosides or certain anti-arrhythmic medicinal products.

No information is available regarding the dualizability of olmesartan or hydrochlorothiazide.

## PHARMACOLOGICAL PROPERTIES

### Pharmacodynamic properties

**Pharmacotherapeutic group:** Angiotensin II antagonist and diuretics.

**ATC code:** C09D A 08

Co-Olesta is a combination of an angiotensin II receptor antagonist, olmesartan medoxomil, and a thiazide diuretic, hydrochlorothiazide. The combination of these ingredients has an additive antihypertensive effect, reducing blood pressure to a greater degree than either component alone.

Once daily dosing with Co-Olesta provides an effective and smooth reduction in blood pressure over the 24-hour dose interval.

Olmesartan medoxomil is an orally active, selective angiotensin II receptor (type AT<sub>1</sub>) antagonist. Angiotensin II is the primary vasoactive hormone of the renin-angiotensin-aldosterone system and plays a significant role in the pathophysiology of hypertension. The effects of angiotensin II include vasoconstriction, stimulation of the synthesis and release of aldosterone, cardiac stimulation and renal reabsorption of sodium. Olmesartan blocks the vasoconstrictor and aldosterone-secreting effects of angiotensin II by blocking its binding to the AT<sub>1</sub> receptor in tissues including vascular smooth muscle and the adrenal gland. The action of olmesartan is independent of the source or route of synthesis of angiotensin II. The selective antagonism of the angiotensin II (AT<sub>1</sub>) receptors by olmesartan results in increases in plasma renin levels and angiotensin I and II concentrations, and some decrease in plasma aldosterone concentrations.

In hypertension, olmesartan medoxomil causes a dose-dependent, long-lasting reduction in arterial blood pressure. There has been no evidence of first-dose hypotension, of tachyphylaxis during long-term treatment, or of rebound hypertension after abrupt cessation of therapy.

Once daily dosing with olmesartan medoxomil provides an effective and smooth reduction in blood pressure over the 24-hour dose interval. Once daily dosing produced similar decreases in blood pressure as twice daily dosing at the same total daily dose.

With continuous treatment, maximum reductions in blood pressure are achieved by 8 weeks after the initiation of therapy, although a substantial proportion of the blood pressure lowering effect is already observed after 2 weeks of treatment.

The effect of olmesartan medoxomil on mortality and morbidity is not yet known.

The Randomized Olmesartan and Diabetes Microalbuminuria Prevention (ROADMAP) study in 4447 patients with type 2 diabetes, normo-albuminuria and at least one additional cardiovascular risk factor, investigated whether treatment with olmesartan could delay the onset of microalbuminuria. During the median follow-up duration of 3.2 years, patients received either olmesartan or placebo in addition to other antihypertensive agents, except ACE inhibitors or ARBs.

For the primary endpoint, the study demonstrated a significant risk reduction in the time to onset of microalbuminuria, in favor of olmesartan. After adjustment for BP differences this risk reduction was no longer statistically significant. 8.2% (178 of 2160) of the patients in the olmesartan group and 9.8% (210 of 2139) in the placebo group developed microalbuminuria.

For the secondary endpoints, cardiovascular events occurred in 96 patients (4.3%) with olmesartan and in 94 patients (4.2%) with placebo. The incidence of cardiovascular mortality was higher with olmesartan compared to placebo treatment (15 patients (0.7%) vs. 3 patients (0.1%)), despite similar rates for non-fatal stroke (14 patients (0.6%) vs. 8 patients (0.4%)), non-fatal myocardial infarction (17 patients (0.8%) vs. 26 patients (1.2%)) and non-cardiovascular mortality (11 patients (0.5%) vs. 12 patients (0.5%)). Overall mortality with olmesartan was numerically increased (26 patients (1.2%) vs. 15 patients (0.7%)), which was mainly driven by a higher number of fatal cardiovascular events.

The Olmesartan Reducing Incidence of End-stage renal disease in Diabetic Nephropathy Trial (ORIENT) investigated the effects of olmesartan on renal and cardiovascular outcomes in 577 randomized Japanese and Chinese type 2 diabetic patients with overt nephropathy. During a median follow-up of 3.1 years, patients received either olmesartan or placebo in addition to other antihypertensive agents including ACE inhibitors.

The primary composite endpoint (time to first event of the doubling of serum creatinine, end-stage renal disease, all-cause death) occurred in 116 patients in the olmesartan group (41.1%) and 129 patients in the placebo group (45.4%) (HR 0.97 (95% CI 0.75 to 1.24); p=0.791). The composite secondary cardiovascular endpoint occurred in 40 olmesartan-treated patients (14.2%) and 53 placebo-treated patients (18.7%). This composite cardiovascular endpoint included cardiovascular death in 10 (3.5%) patients receiving olmesartan versus 3 (1.1%) receiving placebo, overall mortality 19 (6.7%) versus 20 (7.0%), non-fatal stroke 8 (2.8%) versus 11 (3.9%) and non-fatal myocardial infarction 3 (1.1%) versus 7 (2.5%), respectively.

Hydrochlorothiazide is a thiazide diuretic. The mechanism of the antihypertensive effect of thiazide diuretics is not fully known. Thiazides affect the renal tubular mechanisms of electrolyte reabsorption, directly increasing excretion of sodium and chloride in approximately equivalent amounts. The diuretic action of hydrochlorothiazide reduces plasma volume, increases plasma renin activity and increases aldosterone secretion, with consequent increases in urinary potassium and bicarbonate loss, and decreases in serum potassium. The renin-aldosterone link is mediated by angiotensin II and therefore coadministration of an angiotensin II receptor antagonist tends to reverse the potassium loss associated with thiazide diuretics. With hydrochlorothiazide, onset of diuresis occurs at about 2 hours and peak effect occurs at about 4 hours post-dose, whilst the action persists for approximately 6-12 hours.

Epidemiological studies have shown that long-term treatment with hydrochlorothiazide monotherapy reduces the risk of cardiovascular mortality and morbidity.

### Clinical efficacy and safety

The combination of olmesartan medoxomil and hydrochlorothiazide produces additive reductions in blood pressure which generally increase with the dose of each component.

In pooled placebo-controlled studies, administration of the 20 mg /12.5 mg and 20 mg /25 mg combinations of olmesartan medoxomil/hydrochlorothiazide resulted in mean placebo-subtracted systolic/diastolic blood pressure reductions at trough of 12/7 mmHg and 16/9 mmHg, respectively.

Administration of 12.5 mg and 25 mg hydrochlorothiazide in patients insufficiently controlled by olmesartan medoxomil 20 mg monotherapy gave additional reductions in 24-hour systolic/diastolic blood pressures measured by ambulatory blood pressure monitoring of 7/5 mmHg and 12/7 mmHg, respectively, compared with olmesartan medoxomil monotherapy. The additional mean systolic/diastolic blood pressure reductions at trough compared with baseline were 11/10 mmHg and 16/11 mmHg, respectively.

The effectiveness of olmesartan medoxomil /hydrochlorothiazide combination therapy was maintained over long-term (one-year) treatment. Withdrawal of olmesartan medoxomil therapy, with or without concomitant hydrochlorothiazide therapy, did not result in rebound hypertension.

The fixed combinations of olmesartan medoxomil and hydrochlorothiazide 40 mg/12.5 mg and 40 mg/25 mg were investigated in three clinical studies including 1482 hypertensive patients.

A double-blind study with essential hypertension evaluated the effectiveness of Olmesartan medoxomil & Hydrochlorothiazide 40 mg/12.5 mg combination



therapy versus olmesartan medoxomil monotherapy 40 mg with mean sitting diastolic blood pressure reduction being the primary efficacy parameter. Systolic/diastolic blood pressure was reduced by 31.9/18.9 mmHg in the combination group as compared to 26.5/15.8 in the monotherapy group ( $p < 0.0001$ ) after 8 weeks of treatment.

In a double-blind but non-controlled second phase of this study, up-titration of non-responders from olmesartan medoxomil monotherapy 40 mg to Olmesartan medoxomil & Hydrochlorothiazide 40 mg/12.5 mg as well as from Olmesartan medoxomil & Hydrochlorothiazide 40 mg/12.5 mg to Olmesartan medoxomil & Hydrochlorothiazide 40 mg/25 mg resulted in a further relevant decrease in systolic/diastolic blood pressure, thus confirming that up-titration is a clinically meaningful way to improve blood pressure control.

A second double-blind, randomized, placebo-controlled study evaluated the effectiveness of adding hydrochlorothiazide to the treatment of patients not adequately controlled after 8 weeks of treatment with Olmesartan medoxomil 40 mg. Patients either continued on Olmesartan medoxomil 40 mg or received additional hydrochlorothiazide 12.5mg or 25mg respectively for another 8 weeks. A fourth group was randomised to receive Olmesartan medoxomil & Hydrochlorothiazide 20 mg/12.5 mg.

Adding hydrochlorothiazide 12.5 mg or 25 mg resulted in a further reduction in systolic/diastolic blood pressure of 5.2/3.4 mmHg ( $p < 0.0001$ ) and 7.4/5.3 mmHg ( $p < 0.0001$ ) respectively as compared to the Olmesartan medoxomil 40 mg therapy alone.

A comparison between patients receiving Olmesartan medoxomil & Hydrochlorothiazide 20mg/12.5 mg and patients receiving 40 mg/12.5 mg showed a statistical significant difference in systolic blood pressure reduction of 2.6 mmHg in favor of the higher dose combination ( $p=0.0255$ ) whereas for diastolic blood pressure reduction a difference of 0.9 mmHg was observed. Ambulatory blood pressure monitoring (ABPM) based on the mean changes on 24-hour, daytime and night-time diastolic and systolic blood pressure data confirmed the results of conventional blood pressure measures.

Another double-blind, randomised trial compared the effectiveness of a combination treatment with Olmesartan medoxomil & Hydrochlorothiazide 20 mg/25 mg and Olmesartan medoxomil & Hydrochlorothiazide 40 mg/25 mg in patients with inadequately controlled blood pressure after 8 weeks of treatment with Olmesartan medoxomil 40 mg.

After 8 weeks of combination therapy the systolic/diastolic blood pressure was significantly reduced as compared to baseline by 17.1/10.5 mmHg in the Olmesartan medoxomil & Hydrochlorothiazide 20 mg/25 mg group and 17.4/11.2 mmHg in the Olmesartan medoxomil & Hydrochlorothiazide 40 mg/25 mg group. The difference between both treatment groups was not statistically significant when using conventional blood pressure measurement, which might be explained by the known flat dose response effect of angiotensin II receptor antagonists such as Olmesartan medoxomil.

However, a clinically meaningful and statistically significant difference in favor of Olmesartan medoxomil & Hydrochlorothiazide 40 mg/25 mg as compared to Olmesartan medoxomil & Hydrochlorothiazide 20 mg/25 mg was observed in mean 24-hour, daytime and night-time ABPM on both systolic and diastolic blood pressure.

The antihypertensive effect of Olmesartan medoxomil & Hydrochlorothiazide was similar irrespective of age, gender or diabetes status.

#### Other information:

Two large randomized, controlled trials (ONTARGET (ONgoing Telmisartan Alone and in combination with Ramipril Global Endpoint Trial) and VA NEPHRON-D (The Veterans Affairs Nephropathy in Diabetes)) have examined the use of the combination of an ACE-inhibitor with an angiotensin II receptor blocker.

ONTARGET was a study conducted in patients with a history of cardiovascular or cerebrovascular disease, or type 2 diabetes mellitus accompanied by evidence of end-organ damage. VA NEPHRON-D was a study in patients with type 2 diabetes mellitus and diabetic nephropathy.

These studies have shown no significant beneficial effect on renal and/or cardiovascular outcomes and mortality, while an increased risk of hyperkalaemia, acute kidney injury and/or hypotension as compared to monotherapy was observed. Given their similar pharmacodynamic properties, these results are also relevant for other ACE-inhibitors and angiotensin II receptor blockers.

ACE-inhibitors and angiotensin II receptor blockers should therefore not be used concomitantly in patients with diabetic nephropathy.

ALTITUDE (Aliskiren Trial in Type 2 Diabetes Using Cardiovascular and Renal Disease Endpoints) was a study designed to test the benefit of adding aliskiren to a standard therapy of an ACE-inhibitor or an angiotensin II receptor blocker in patients with type 2 diabetes mellitus and chronic kidney disease, cardiovascular disease, or both. The study was terminated early because of an increased risk of adverse outcomes. Cardiovascular death and stroke were both numerically more frequent in the aliskiren group than in the placebo group and adverse events and serious adverse events of interest (hyperkalaemia, hypotension and renal dysfunction) were more frequently reported in the aliskiren group than in the placebo group.

#### Non-melanoma skin cancer:

Based on available data from epidemiological studies, cumulative dose-dependent association between HCTZ and NMSC has been observed. One study included a population comprised of 71,533 cases of BCC and of 8,629 cases of SCC matched to 1,430,833 and 172,462 population controls, respectively. High HCTZ use ( $\geq 50,000$  mg cumulative) was associated with an adjusted OR of 1.29 (95% CI: 1.23-1.35) for BCC and 3.98 (95% CI: 3.68-4.31) for SCC. A clear cumulative dose response relationship was observed for both BCC and SCC. Another study showed a possible association between lip cancer (SCC) and exposure to HCTZ: 633 cases of lip-cancer were matched with 63,067 population controls, using a risk-set sampling strategy. A cumulative dose-response relationship was demonstrated with an adjusted OR 2.1 (95% CI: 1.7-2.6) increasing to OR 3.9 (3.0-4.9) for high use ( $\sim 25,000$  mg) and OR 7.7 (5.7-10.5) for the highest cumulative dose ( $\sim 100,000$  mg).

### **Pharmacokinetic Properties**

#### **Absorption and distribution**

##### *Olmesartan medoxomil:*

Olmesartan medoxomil is a prodrug. It is rapidly converted to the pharmacologically active metabolite, olmesartan, by esterases in the gut mucosa and in portal blood during absorption from the gastrointestinal tract. No intact olmesartan medoxomil or intact side chain medoxomil moiety have been detected in plasma or excreta. The mean absolute bioavailability of olmesartan from a tablet formulation was 25.6%.

The mean peak plasma concentration ( $C_{max}$ ) of olmesartan is reached within about 2 hours after oral dosing with olmesartan medoxomil, and olmesartan plasma concentrations increase approximately linearly with increasing single oral doses up to about 80 mg.

Food had minimal effect on the bioavailability of olmesartan and therefore olmesartan medoxomil may be administered with or without food.

No clinically relevant gender-related differences in the pharmacokinetics of olmesartan have been observed.

Olmesartan is highly bound to plasma protein (99.7%), but the potential for clinically significant protein binding displacement interactions between olmesartan and other highly bound coadministered active substances is low (as confirmed by the lack of a clinically significant interaction between olmesartan medoxomil and warfarin). The binding of olmesartan to blood cells is negligible. The mean volume of distribution after intravenous dosing is low (16 – 29 L).

##### *Hydrochlorothiazide:*

Following oral administration of olmesartan medoxomil and hydrochlorothiazide in combination, the median time to peak concentrations of hydrochlorothiazide was 1.5 to 2 hours after dosing. Hydrochlorothiazide is 68 % protein bound in the plasma and its apparent volume of distribution is 0.83 – 1.14 L/kg.

#### **Biotransformation and elimination**

##### *Olmesartan medoxomil:*

Total plasma clearance of Olmesartan was typically 1.3 L/h (CV, 19%) and was relatively slow compared to hepatic blood flow (ca 90 L/h). Following a single oral dose of  $^{14}C$ -labelled olmesartan medoxomil, 10 - 16% of the administered radioactivity was excreted in the urine (the vast majority within

24 hours of dose administration) and the remainder of the recovered radioactivity was excreted in the feces. Based on the systemic availability of 25.6%, it can be calculated that absorbed olmesartan is cleared by both renal excretion (ca 40%) and hepato-biliary excretion (ca 60%). All recovered radioactivity was identified as olmesartan. No other significant metabolite was detected. Enterohepatic recycling of olmesartan is minimal. Since a large proportion of olmesartan is excreted via the biliary route, use in patients with biliary obstruction is contraindicated.

The terminal elimination half life of olmesartan varied between 10 and 15 hours after multiple oral dosing. Steady state was reached after the first few doses and no further accumulation was evident after 14 days of repeated dosing. Renal clearance was approximately 0.5 – 0.7 L/h and was independent of dose.

#### *Hydrochlorothiazide:*

Hydrochlorothiazide is not metabolized in man and is excreted almost entirely as unchanged active substance in urine. About 60 % of the oral dose is eliminated as unchanged active substance within 48 hours. Renal clearance is about 250 – 300 mL/min. The terminal elimination half-life of hydrochlorothiazide is 10 – 15 hours.

#### **Combination of Olmesartan medoxomil & Hydrochlorothiazide**

The systemic availability of hydrochlorothiazide is reduced by about 20% when co-administered with olmesartan medoxomil, but this modest decrease is not of any clinical relevance. The kinetics of olmesartan are unaffected by the co-administration of hydrochlorothiazide.

#### Pharmacokinetics in special populations

##### *Elderly (age 65 years or over):*

In hypertensive patients, the olmesartan AUC at steady state was increased by ca 35% in elderly people (65 – 75 years old) and by ca 44% in very elderly people (≥ 75 years old) compared with the younger age group.

Limited data suggest that the systemic clearance of hydrochlorothiazide is reduced in both healthy and hypertensive elderly people compared to young healthy volunteers.

##### *Renal impairment:*

In renally impaired patients, the olmesartan AUC at steady state increased by 62%, 82% and 179% in patients with mild, moderate and severe renal impairment, respectively, compared to healthy controls.

The maximum dose of olmesartan medoxomil in patients with mild to moderate renal impairment (creatinine clearance of 30 – 60 mL/min) is 20 mg olmesartan medoxomil once daily. The use of olmesartan medoxomil in patients with severe renal impairment (creatinine clearance of < 30 mL/min) is not recommended.

The half-life of hydrochlorothiazide is prolonged in patients with impaired renal function.

##### *Hepatic impairment:*

After single oral administration, olmesartan AUC values were 6% and 65% higher in mildly and moderately hepatically impaired patients, respectively, than in their corresponding matched healthy controls. The unbound fraction of olmesartan at 2 hours post-dose in healthy subjects, in patients with mild hepatic impairment and in patients with moderate hepatic impairment was 0.26%, 0.34% and 0.41%, respectively. Following repeated dosing in patients with moderate hepatic impairment, olmesartan mean AUC was again about 65% higher than in matched healthy controls. Olmesartan mean  $C_{max}$  values were similar in hepatically-impaired and healthy subjects.

In patients with moderate hepatic impairment, an initial dose of 10 mg olmesartan medoxomil once daily is recommended and the maximum dose should not exceed 20 mg once daily. Olmesartan medoxomil has not been evaluated in patients with severe hepatic impairment.

Hepatic impairment does not significantly influence the pharmacokinetics of hydrochlorothiazide.

#### **Drug interactions**

##### *Bile acid sequestering agent colesevelam:*

Concomitant administration of 40 mg olmesartan medoxomil and 3750 mg colesevelam hydrochloride in healthy subjects resulted in 28% reduction in  $C_{max}$  and 39% reduction in AUC of olmesartan. Lesser effects, 4% and 15% reduction in  $C_{max}$  and AUC respectively, were observed when olmesartan medoxomil was administered 4 hours prior to colesevelam hydrochloride. Elimination half life of olmesartan was reduced by 50 – 52% irrespectively of whether administered concomitantly or 4 hours prior to colesevelam hydrochloride

#### **PRECLINICAL SAFETY DATA**

The toxic potential of olmesartan medoxomil/hydrochlorothiazide combinations was evaluated in repeated dose oral toxicity studies for up to six months in rats and dogs.

As for each of the individual substances and other medicinal products in this class, the main toxicological target organ of the combination was the kidney. The combination of olmesartan medoxomil/hydrochlorothiazide induced functional renal changes (increases in serum urea nitrogen and in serum creatinine). High dosages caused tubular degeneration and regeneration in the kidneys of rats and dogs, probably via a change in renal hemodynamics (reduced renal perfusion resulting from hypotension with tubular hypoxia and tubular cell degeneration). In addition the olmesartan medoxomil/hydrochlorothiazide combination caused a decrease in red blood cell parameters (erythrocytes, hemoglobin and hematocrit) and a reduction in heart weight in rats.

These effects have also been observed for other AT<sub>1</sub> receptor antagonists and for ACE inhibitors and they seem to have been induced by the pharmacological action of high dosages of olmesartan medoxomil and seem to be not relevant to humans at the recommended therapeutic doses.

Genotoxicity studies using combined olmesartan medoxomil and hydrochlorothiazide as well as the individual components have not shown any signs of a clinically relevant genotoxic activity.

The carcinogenic potential of a combination of olmesartan medoxomil and hydrochlorothiazide was not investigated as there was no evidence of relevant carcinogenic effects for the two individual components under conditions of clinical use.

There was no evidence of teratogenicity in mice or rats treated with olmesartan medoxomil/hydrochlorothiazide combinations. As expected from this class of medicinal product, foetal toxicity was observed in rats, as evidenced by significantly reduced foetal body weights, when treated with olmesartan medoxomil/hydrochlorothiazide combinations during gestation

#### **PRESENTATION**

Co-Olesta 20+12.5mg boxes containing 10 tablets (1x10's Alu-Alu strips).

Co-Olesta 40+12.5mg boxes containing 10 tablets (1x10's Alu-Alu strips).

#### **INSTRUCTIONS**

To be sold on prescription of a registered medical practitioner only.

Protect from moisture, freezing, excessive heat and sunlight.

Keep out of the reach of children.

#### **REGISTRATION NUMBER**

Co-Olesta 20+12.5mg Tablets: 058022

Co-Olesta 40+12.5mg Tablets: 058023

#### **NAME AND BUSINESS ADDRESS OF THE HOLDER OF THE CERTIFICATE OF REGISTRATION**

Mfg. Searle Specs.

*Manufactured by:*

*The Searle Company Limited,*

*F-319, S.I.T.E., Karachi-Pakistan.*

**DATE OF PUBLICATION OF THE PACKAGE INSERT**

June 2021

SPL/SPC-DEX.C/621-000(001)