

PRODUCT NAME : Escitalopram Tablets, USP	COUNTRY : US	LOCATION : Indrad / Dahej	Supersedes AW No.:
ITEM / PACK : Outsert	NO. OF COLORS: 1	REMARK :	V. No. : 01
DESIGN STYLE : Front Side	PANTONE SHADE NOS.:	SUBSTRATE : 28 gm ² Bible Paper	
CODE : 8097501	Black	Activities	Department
DIMENSIONS (MM) : 640 x 510		Prepared By	Pkg. Dev.
ART WORK SIZE : S/S		Reviewed By	Pkg. Dev.
DATE : 20-07-2024	Font Size 6.5 pt, Med. 10 pt	Approved By	Quality

Note: Pharma code/ Bar code and adjacent text must be visible on folded leaflet. These details can be moved by printed to arrange pharma code/ Bar code and adjacent text visible on folded leaflet.

HIGHLIGHTS OF PRESCRIBING INFORMATION

These highlights do not include all the information needed to use ESCITALOPRAM TABLETS safely and effectively. See full prescribing information for ESCITALOPRAM TABLETS.

ESCITALOPRAM Tablets, for oral use

Initial U.S. Approval: 2002

WARNING: SUICIDAL THOUGHTS AND BEHAVIORS
See full prescribing information for complete boxed warning.

Increased risk of suicidal thoughts and behavior in pediatric and young adult patients taking antidepressants. Closely monitor all antidepressant-treated patients for clinical worsening and emergence of suicidal thoughts and behaviors (5.1). Escitalopram tablets are not approved for use in pediatric patients less than 7 years of age (8.4).

RECENT MAJOR CHANGES

Indications (1)	5/2023
Dosage and Administration (2, 2.2, 2.3, 2.5)	5/2023
Dosage and Administration: Use of Escitalopram with Other MAOIs such as Linezolid or Methylene Blue (2.7) - Removed	5/2023
Warnings and Precautions (5.2, 5.7)	8/2023

INDICATIONS AND USAGE

Escitalopram is a selective serotonin reuptake inhibitor (SSRI) indicated for the:

- treatment of major depressive disorder (MDD) in adults and pediatric patients 12 years of age and older (1)
- treatment of generalized anxiety disorder (GAD) in adults (2)

DOSE AND ADMINISTRATION

Indication and Population	Recommended Dosage
MDD in Adults (2.1)	Initial: 10 mg once daily Recommended: 10 mg once daily Maximum: 20 mg once daily
MDD in Pediatric Patients 12 and older (2.1)	Initial: 10 mg once daily Recommended: 10 mg once daily Maximum: 20 mg once daily
GAD in Adults (2.2)	Initial: 10 mg once daily Recommended: 10 mg once daily Maximum: 20 mg once daily

ADVERSE REACTIONS

Most commonly observed adverse reactions (incidence $> 5\%$ and at least twice the incidence of placebo patients) in SSRI-treated patients include: nausea, constipation, decreased libido, and anorgasmia (6.1).

DRUG INTERACTIONS

- Concomitant use with SSRIs, SNRIs or Tryptophan is not recommended (7)
- Use caution when concomitant use with drugs that affect hemostasis (NSAIDs, Aspirin, Warfarin) (7)

USE IN SPECIFIC POPULATIONS

- Pregnancy: SSRI use, particularly late in pregnancy, may increase the risk for persistent pulmonary hypertension and symptoms of poor adaptation (respiratory distress, temperature instability, feeding difficulties, hypoxemia, tremor, irritability) in the neonates (8.1)

HOW SUPPLIED/STORAGE AND HANDLING

Escitalopram Tablets are supplied in the following strengths and packaging:

- 5 mg, 10 mg (scored), and 20 mg (scored)

CONTRAINDICATIONS

- Do not use MAOIs intended to treat psychiatric disorders with escitalopram or within 14 days of stopping treatment with escitalopram. Do not use escitalopram within 14 days of stopping an MAOI intended to treat psychiatric disorders. In addition, do not start escitalopram in a patient who is being treated with linezolid or intravenous methylene blue (4)

ADVERSE REACTIONS

See full prescribing information for complete boxed warning.

WARNINGS AND PRECAUTIONS

- Increased risk of suicidal thoughts and behaviors in pediatric and young adult patients taking antidepressants. Closely monitor all antidepressant-treated patients for clinical worsening and emergence of suicidal thoughts and behaviors (see **Warnings and Precautions (5.1)**). Escitalopram tablets are not approved for use in pediatric patients less than 7 years of age (see **Use in Specific Populations (8.4)**).

ADVERSE REACTIONS

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INDICATIONS AND USAGE

- 1. Major Depressive Disorder
- 2. Generalized Anxiety Disorder
- 2.3 Administration Information
- 2.4 Screen for Bipolar Disorder Prior to Starting Escitalopram Tablets
- 2.5 Recommended Dosage for Specific Populations
- 2.6 Discontinuation of Treatment with Escitalopram Tablets

DOSEAGE FORMS AND STRENGTHS

- 3.1 Escitalopram Tablets
- 3.2 Switching Patients to or from a Monoamine Oxidase Inhibitor (MAOI) Antidepressant

CONTRAINDICATIONS

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ADVERSE REACTIONS

- 5.1 Suicidal Thoughts and Behaviors in Adolescents and Young Adults
- 5.2 Serotonin Syndrome
- 5.3 Discontinuation Syndrome
- 5.4 Seizures
- 5.5 Activation of Mania or Hypomania
- 5.6 Hypomania
- 5.7 Increased Risk of Bleeding
- 5.8 Interference with Cognitive and Motor Performance
- 5.9 Angle Closure Glaucoma
- 5.10 Use in Patients with Concomitant Illness
- 5.11 Sexual Dysfunction

DRUG INTERACTIONS

- 7.1 Concomitant use with SSRIs, SNRIs or Tryptophan is not recommended (7)
- 7.2 Use caution when concomitant use with drugs that affect hemostasis (NSAIDs, Aspirin, Warfarin) (7)

USE IN SPECIFIC POPULATIONS

- 8.1 Pregnancy: SSRI use, particularly late in pregnancy, may increase the risk for persistent pulmonary hypertension and symptoms of poor adaptation (respiratory distress, temperature instability, feeding difficulties, hypoxemia, tremor, irritability) in the neonates (8.1)

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ADVERSE REACTIONS

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WARNINGS AND PRECAUTIONS

- 5.1 Serotonin Syndrome: Increased risk of suicidal thoughts and behaviors was greater than in placebo-treated patients. There was considerable variation in risk of suicidal thoughts and behaviors among drugs, but there was an increased risk identified in young patients for most drugs studied. There were differences in absolute risk of suicidal thoughts and behaviors across the different indications, and the highest incidence in patients with MDD. The drug-label differences in the number of cases of suicidal thoughts and behaviors per 1,000 patients treated are provided in Table 1.

Table 1: Risk Differences of the Number of Patients with Suicidal Thoughts and Behaviors in the Pooled Placebo-Controlled Trials of Antidepressants in Pediatric and Young Adult Patients

Age Range	Drug-Placebo Difference in Number of Patients with Suicidal Thoughts and Behaviors per 1,000 Patients Treated
<18 years old	14 additional patients
18 to 24 years old	5 additional patients
25 to 64 years old	Decreases Compared to Placebo
>65 years old	1 fewer patient

Table 2: Increased Risk of Bleeding

Increased risk of bleeding was observed in patients treated with escitalopram compared to placebo in the pooled placebo-controlled trials of antidepressants in pediatric and young adult patients.

Table 3: Risk Differences of the Number of Patients with Suicidal Thoughts and Behaviors in the Pooled Placebo-Controlled Trials of Antidepressants in Pediatric and Young Adult Patients

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MEDICATION GUIDE

Escitalopram (EE sye TAL o pram) Tablets, USP

What is the most important information I should know about escitalopram tablets?

Escitalopram tablets may cause serious side effects, including:

- Increased risk of suicidal thoughts or actions.** Escitalopram tablets and other antidepressant medicines increase the risk of suicidal thoughts and actions in people 24 years of age and younger, **especially within the first few months of treatment or when the dose is changed.**
 - Depression or other mental illnesses are the most important causes of suicidal thoughts or actions.**
- How can I watch for and try to prevent suicidal thoughts and actions?**
 - Pay close attention to any changes, especially sudden changes in mood, behavior, thoughts, or feelings, or if you or your child develop suicidal thoughts or actions. This is very important when an antidepressant medicine is started or when the dose is changed.
 - Call your healthcare provider right away to report new or sudden changes in mood, behavior, thoughts, or feelings or if you or your child develop suicidal thoughts or actions.
 - Keep all follow-up visits with your healthcare provider as scheduled and call your healthcare provider between visits if you are worried about symptoms.

Call your healthcare provider or get emergency medical help right away if you or your child have any of the following symptoms, especially if they are new, worse, or worry you:

- attempts to commit suicide, or
 - acting on dangerous impulses
 - thoughts about suicide or dying
 - new or worsening depression
 - new or worse anxiety
 - feeling very agitated or restless
 - panic attacks
 - trouble sleeping
 - an extreme increase in activity or talking (mania) or other unusual changes in behavior or mood

HOW SUPPLIED/STORAGE AND HANDLING

Escitalopram tablets, USP 5 mg are white to off-white, round, biconvex, film coated tablets debossed with '135' on one side and '5' on other side.

Bottles of 30	NDC 13668-136-30
Bottles of 100	NDC 13668-136-01
Bottles of 500	NDC 13668-136-05
Bottles of 1000	NDC 13668-136-10
Bottles of 4000	NDC 13668-136-40

Escitalopram tablets, USP 10 mg are white to off-white, round, biconvex, film coated tablets debossed with break line on one side, separating '11' and '36' on one side, and '11' and '36' on other side.

Bottles of 30	NDC 13668-136-30
Bottles of 100	NDC 13668-136-01
Bottles of 500	NDC 13668-136-05
Bottles of 1000	NDC 13668-136-10
Bottles of 3000	NDC 13668-136-43

Escitalopram tablets, USP 20 mg are white to off-white, round, biconvex, film coated tablets debossed with break line on one side, separating '11' and '37' on one side, and '20' on other side.

Bottles of 30	NDC 13668-137-30
Bottles of 100	NDC 13668-137-01
Bottles of 500	NDC 13668-137-05
Bottles of 1000	NDC 13668-137-10
Bottles of 2000	NDC 13668-137-20

Storage and Handling
Store at 20° to 25°C (68° to 77°F); excursions permitted to 15° to 30°C (59° to 86°F) [see USP Controlled Room Temperature].

metabolites demethylcitalopram and dimethylcitalopram (DDCT) similar to those observed in dogs at 8 mg/kg/day. A subsequent in vivo study demonstrated that in beagle dogs, racemic DDCT caused DT prolongation, a known risk factor for the observed outcome in dogs.

14 CLINICAL STUDIES

14.1 Major Depressive Disorder

Adults
The efficacy of escitalopram as a treatment for major depressive disorder was established in three, 8-week, placebo-controlled studies conducted in outpatients between 18 and 65 years of age who met DSM-IV criteria for major depressive disorder. The primary outcome in all three studies was change from baseline to endpoint in the Montgomery-Asberg Depression Rating Scale (MADRS).

A fixed-dose study comparing 10 mg daily escitalopram and 20 mg daily escitalopram to placebo and 40 mg daily citalopram. The 10 mg daily and 20 mg daily escitalopram treatment groups showed statistically significant greater mean improvement compared to placebo on the MADRS. The 10 mg and 20 mg escitalopram groups were similar on this outcome measure.

In a second fixed-dose study of 10 mg daily escitalopram and placebo, the 10 mg daily escitalopram treatment group showed statistically significant greater mean improvement compared to placebo on the MADRS. Analyses of the relationships between treatment outcome and age, gender, and race did not suggest any differential responsiveness on the basis of these patient characteristics.

In a longer-term trial, 274 patients meeting (DSM-IV) criteria for major depressive disorder, who had responded during an initial 8-week, open-label treatment phase with escitalopram 10 mg or 20 mg daily, were randomized to continuation of escitalopram at their same dose, or to placebo, for up to 36 weeks of observation for relapse. Response during the open-label phase was defined by having a decrease of the MADRS total score to ≤ 12. Relapse during the double-blind phase was defined as an increase of the MADRS total score to > 22, or discontinuation due to insufficient clinical response. Patients receiving continued escitalopram experienced a statistically significant longer time to relapse compared to those receiving placebo.

Pediatric Patients 12 years of age and older
The efficacy of escitalopram as a treatment for major depressive disorder in pediatric patients 12 to 17 years was established in an 8-week, flexible-dose, placebo-controlled study that compared escitalopram tablets (10 mg to 20 mg daily) to placebo in outpatients 12 to 17 years of age inclusive who met DSM-IV criteria for major depressive disorder (MDD). The primary outcome was change from baseline to endpoint in the Children's Depression Rating Scale - Revised (CDRS-R). In this study, escitalopram showed statistically significant greater mean improvement compared to placebo on the CDRS-R.

The efficacy of escitalopram in the treatment of major depressive disorder in pediatric patients 12 to 17 years was established, in part, on the basis of extrapolation from the 8-week, flexible-dose, placebo-controlled study with racemic citalopram 20 mg to 40 mg daily. In this outpatient study in pediatric patients 7 to 17 years of age who met DSM-IV criteria for major depressive disorder, citalopram treatment showed statistically significant greater mean improvement from baseline, compared to placebo, on the CDRS-R; the positive results for this trial largely came from the 12 to 17 year subgroup.

Two additional flexible-dose, placebo-controlled MDD studies (one escitalopram study in patients ages 7 to 17 years and one citalopram study patients 13 to 18 years) did not demonstrate efficacy. The safety and effectiveness of escitalopram have not been established in pediatric patients less than 12 years of age with MDD.

14.2 Generalized Anxiety Disorder

The efficacy of escitalopram in the treatment of generalized anxiety disorder (GAD) in adults was demonstrated in three, 8-week, multicenter, flexible-dose, placebo-controlled studies that compared escitalopram tablets (10 mg to 20 mg daily) to placebo in outpatients between 18 and 60 years of age who met DSM-IV criteria for GAD. In all three studies, escitalopram showed statistically significant greater mean improvement compared to placebo on the Hamilton Anxiety Scale (HAM-A).

There were too few patients in differing ethnic and age groups to adequately assess whether or not escitalopram has different effects in these groups. There is an difference in response to escitalopram between men and women.

Additional pediatric use information is approved for AbbVie Inc.'s LEXAPRO[®] (escitalopram) tablets. However, due to AbbVie Inc.'s marketing exclusivity rights, this drug product is not labeled with that information.

HOW SUPPLIED/STORAGE AND HANDLING
Escitalopram tablets, USP 5 mg are white to off-white, round, biconvex, film coated tablets debossed with '135' on one side and '5' on other side.

Bottles of 30	NDC 13668-136-30
Bottles of 100	NDC 13668-136-01
Bottles of 500	NDC 13668-136-05
Bottles of 1000	NDC 13668-136-10
Bottles of 4000	NDC 13668-136-40

Escitalopram tablets, USP 10 mg are white to off-white, round, biconvex, film coated tablets debossed with break line on one side, separating '11' and '36' on one side, and '11' and '36' on other side.

Bottles of 30	NDC 13668-136-30
Bottles of 100	NDC 13668-136-01
Bottles of 500	NDC 13668-136-05
Bottles of 1000	NDC 13668-136-10
Bottles of 3000	NDC 13668-136-43

Escitalopram tablets, USP 20 mg are white to off-white, round, biconvex, film coated tablets debossed with break line on one side, separating '11' and '37' on one side, and '20' on other side.

Bottles of 30	NDC 13668-137-30
Bottles of 100	NDC 13668-137-01
Bottles of 500	NDC 13668-137-05
Bottles of 1000	NDC 13668-137-10
Bottles of 2000	NDC 13668-137-20

Storage and Handling
Store at 20° to 25°C (68° to 77°F); excursions permitted to 15° to 30°C (59° to 86°F) [see USP Controlled Room Temperature].

17 PATIENT COUNSELING INFORMATION
Advise the patient to read the FDA-approved patient labeling (Medication Guide).

Suicidal Thoughts and Behaviors
Advise patients, their families and caregivers to look for the emergence of suicidal ideation and behavior, especially during treatment and when the dose is adjusted up or down, and instruct them to report such symptoms to their healthcare provider. *[see Boxed Warning and Warnings and Precautions (5.1)].*

Serotonin Syndrome
Caution patients about the risk of serotonin syndrome, particularly with the concomitant use of escitalopram with other serotonergic drugs including triptans, tricyclic antidepressants, opioids, lithium, tryptophan, buspirone, amphetamines, and St. John's Wort, and with drugs that impair metabolism of serotonin (in particular, MAOIs, both those intended to treat psychiatric disorders and also others, such as linezolid). Instruct patients to contact their health care provider or report to the emergency room if they experience signs or symptoms of serotonin syndrome. *[see Warnings and Precautions (5.2), Drug Interactions (7)].*

Discontinuation Syndrome
Advise patients not to abruptly discontinue escitalopram tablets and to discuss any tapering regimen with their healthcare provider. Inform patients that adverse reactions can occur when escitalopram tablets are discontinued. *[see Warnings and Precautions (5.3)].*

Activation of Mania or Hypomania
Advise patients and their caregivers to observe for signs of activation of mania/hypomania and instruct them to report such symptoms to the healthcare provider. *[see Warnings and Precautions (5.5)].*

Increased Risk of Bleeding
Inform patients about the concomitant use of escitalopram with NSAIDs, aspirin, warfarin, other antiplatelet drugs, or other anticoagulants because the combined use has been associated with an increased risk of bleeding. Advise patients to inform their healthcare providers if they are taking or planning to take any prescription or over-the-counter medications that increase the risk of bleeding. *[see Warnings and Precautions (5.7)].*

Angle Closure Glaucoma

Advise patients that taking escitalopram tablets can cause mild pupillary dilation, which in susceptible individuals, can lead to an episode of angle closure glaucoma. Pre-existing glaucoma is almost always open-angle glaucoma because angle closure glaucoma, when diagnosed, can be treated definitively with iridectomy. Open-angle glaucoma is not a risk factor for angle closure glaucoma. Patients may wish to be examined to determine whether they are susceptible to angle closure, and have a prophylactic procedure (e.g., iridectomy), if they are susceptible. *[see Warnings and Precautions (5.9)].*

Sexual Dysfunction

Sexual dysfunction of use of escitalopram may cause symptoms of sexual dysfunction in both male and female patients. Inform patients that they should discuss any changes in sexual function and potential management strategies with their healthcare provider. *[see Warnings and Precautions (5.11)].*

Concomitant Medications
Since escitalopram is the active isomer of racemic citalopram (Celexa), the two agents should not be coadministered. Patients should be advised to inform their physician if they are taking, or plan to take, any prescription or over-the-counter drugs, as there is a potential for interactions.

Interference with Psychomotor Performance
Because psychoactive drugs may impair judgment, thinking, or motor skills, patients should be cautioned about operating hazardous machinery, including automobiles, until they are reasonably certain that escitalopram tablets therapy does not affect their ability to engage in such activities.

Alcohol
Patients should be told that, although escitalopram has not been shown in experiments with normal subjects to increase the mental and motor skill impairments caused by alcohol, the concomitant use of escitalopram and alcohol in depressed patients is not advised.

Pregnancy

Advise pregnant women to notify their healthcare providers if they become pregnant or intend to become pregnant during treatment with escitalopram tablets.

Advise patients that escitalopram use later in pregnancy may lead to increased risk for neonatal complications requiring prolonged hospitalization, respiratory support, tube feeding, and/or persistent pulmonary hypertension (PPHN) in the newborn. *[see Use in Specific Populations (8.1)].*

Advise women that there is a pregnancy exposure registry that monitors pregnancy outcomes in women exposed to escitalopram during pregnancy. *[see Use in Specific Populations (8.1)].*

Lactation
Advise breastfeeding women using escitalopram to monitor infants for excess sedation, restlessness, agitation, poor feeding, poor weight gain and to seek medical care if they notice these signs. *[see Use in Specific Populations (8.2)].*

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Escitalopram tablets, USP are white to off-white, round, biconvex, film-coated tablets containing 6.38 mg, 12.75 mg, and 25.55 mg escitalopram oxalate in strengths equivalent to 5 mg, 10 mg, and 20 mg, respectively, of escitalopram base. The 10 and 20 mg tablets are scored. The tablets also contain the following inactive ingredients: cellulose microcrystalline, colloidal silicon dioxide, croscarmellose sodium, magnesium stearate, povidone and talc. The film coating contains hypromellose, polyethylene glycol 400 and titanium dioxide.

Meets USP Dissolution Test 2.

12 CLINICAL PHARMACOLOGY

12.1 Mechanism of Action

The mechanism of antidepressant action of escitalopram, the S-enantiomer of racemic citalopram, is presumed to be linked to potentiation of serotonergic activity in the central nervous system (CNS) resulting from its inhibition of CNS neuronal reuptake of serotonin (5-HT).

12.2 Pharmacodynamics

In vitro and *in vivo* studies in animals suggest that escitalopram is a highly selective serotonin reuptake inhibitor (SSRI) with minimal effects on norepinephrine and dopamine neuronal reuptake. Escitalopram is at least 100-fold more potent than the S-enantiomer with respect to inhibition of 5-HT reuptake and inhibition of 5-HT neuronal firing rate. Tolerance to a model of antidepressant effect in rats was not induced by long-term (up to 5 weeks) treatment with escitalopram. Escitalopram has no or very low affinity for serotonergic (5-HT_{1A}) or other receptors including alpha- and beta-adrenergic, dopamine (D₁₋₃), histamine (H₁₋₃), muscarinic (M₁₋₃), and benzodiazepine receptors. Escitalopram also does not bind to, or has low affinity for, various ion channels including Na⁺, K⁺, Cl⁻, and Ca²⁺ channels. Antagonism of muscarinic, histaminergic, and adrenergic receptors has been hypothesized to be associated with various anticholinergic, sedative, and cardiovascular side effects of other psychotropic drugs.

12.3 Pharmacokinetics

The single- and multiple-dose pharmacokinetics of escitalopram are linear and dose-proportional in a dose range of 10 to 30 mg/day. The absolute bioavailability of citalopram is about 80% relative to an intravenous dose. The tablet and the oral solution dosage forms of escitalopram oxalate are bioequivalent.

Following a single oral dose (20 mg tablet or solution) of escitalopram, peak blood levels occur at about 5 hours. Absorption of escitalopram is not affected by food.

Distribution

The binding of escitalopram to human plasma proteins is approximately 56%. The volume of distribution of citalopram is about 12 L/kg. Data specific for escitalopram are unavailable.

Elimination

Biotransformation of escitalopram is mainly hepatic, with a mean terminal half-life of about 27 to 32 hours. The oral clearance of escitalopram is 600 mL/min, with approximately 7% of that due to renal clearance.

Metabolism

Escitalopram is metabolized to S-D-DOCT and S-didemethylcitalopram (S-DDOCT). In humans, unchanged escitalopram is the predominant compound in plasma. At steady state, the concentration of the escitalopram metabolite S-D-CT in plasma is approximately one-third that of escitalopram. The level of S-DDOCT is not detectable in most subjects. *In vitro* studies show that escitalopram is at least 7 to 27 times more potent than S-D-CT and S-DDCT, respectively, in the inhibition of serotonin reuptake, suggesting that the metabolites of escitalopram do not contribute significantly to the antidepressant actions of escitalopram. S-D-CT and S-DDOCT also have no or very low affinity for serotonergic (5-HT_{1A}) or other receptors including alpha- and beta-adrenergic, dopamine (D₁₋₃), histamine (H₁₋₃), muscarinic (M₁₋₃), and benzodiazepine receptors. S-D-CT and S-DDOCT also do not bind to various ion channels including Na⁺, K⁺, Cl⁻, and Ca²⁺ channels. *In vitro* studies using human liver microsomes indicated that CYP3A4 and CYP2C19 are the primary isozymes involved in the N-demethylation of escitalopram.

Excretion

Following oral administrations of escitalopram, the fraction of drug recovered in the urine as escitalopram and S-demethylcitalopram (S-DC1) is about 8% and 10%, respectively.

Specific Populations

Pediatric Patients

Pediatric patients 12 to 17 years of age in a single dose study of 10 mg escitalopram, AUC of escitalopram decreased by 19%, and C_{max} increased by 26% in healthy pediatric subjects 12 to 17 years of age compared to adults. Following multiple dosing of 40 mg/day citalopram, escitalopram elimination half-life, steady-state C_{max} and AUC were similar in pediatric patients 12 to 17 years of age with MDD compared to adults. *[see Use in Specific Populations (8.4)].*

Geriatric Patients

Escitalopram pharmacokinetics in subjects > 65 years of age were compared to adults in a single-dose and a multiple-dose study. Escitalopram AUC and half-life were increased by approximately 50% in elderly subjects, and C_{min} was unchanged. *[see Dosage and Administration (2.5), Use in Specific Populations (8.5)].*

Male and Female Patients

Based on data from single- and multiple-dose studies measuring escitalopram in elderly, young adults, and adolescents, no dosage adjustment on the basis of gender is needed.

Patients with Hepatic Impairment

Citalopram oral clearance was reduced by 37% and half-life was doubled in patients with reduced hepatic function compared to normal subjects. *[see Dosage and Administration (2.5), Use in Specific Populations (8.6)].*

Patients with Renal Impairment

In patients with mild to moderate renal function impairment, oral clearance of citalopram was reduced by 17% compared to normal subjects. No information is available about the pharmacokinetics of escitalopram in patients with severely reduced renal function (creatinine clearance < 20 mL/min). *[see Use in Specific Populations (8.7)].*

Drug Interaction Studies

In vitro enzyme inhibition data did not reveal an inhibitory effect of escitalopram on CYP3A4, -1A2, -2C9, -2C19, and -2E1. Based on *in vitro* data, escitalopram would be expected to have little inhibitory effect on *in vivo* metabolism mediated by these cytochromes. While *in vivo* data to address this question are limited, results from drug interaction studies suggest that escitalopram, at a dose of 20 mg, has no 3A4 inhibitory effect and a modest 2D6 inhibitory effect. *[see Drug Interactions (7)].*

CYP3A4 and CYP2C19 Inhibitors

In vitro studies indicated that CYP3A4 and -2C19 are the primary enzymes involved in the metabolism of escitalopram. However, coadministration of escitalopram (20 mg) and ritonavir (600 mg), a potent inhibitor of CYP3A4, did not significantly affect the pharmacokinetics of escitalopram. Because escitalopram is metabolized by multiple enzyme systems, inhibition of a single enzyme may not appreciably decrease escitalopram clearance.

Cimetidine

In subjects who had received 21 days of 40 mg/day racemic citalopram, combined administration of 400 mg twice a day cimetidine for 8 days resulted in an increase in citalopram AUC and C_{min} of 43% and 39%, respectively. The clinical significance of these findings is unknown.

Digoxin

In subjects who had received 21 days of 40 mg/day racemic citalopram, combined administration of citalopram and digoxin (single dose of 1 mg) did not significantly affect the pharmacokinetics of either citalopram or digoxin.

Lithium

Coadministration of racemic citalopram (40 mg/day for 10 days) and lithium (30 mmol/day for 5 days) had no significant effect on the pharmacokinetics of citalopram or lithium. Plasma lithium levels should be monitored with appropriate adjustment to the lithium dose in accordance with standard clinical practice. Because lithium may enhance the serotonergic effects of escitalopram, caution should be exercised when escitalopram tablets and lithium are coadministered.

Theophylline

Combined administration of racemic citalopram (40 mg/day for 21 days) and the CYP1A2 substrate theophylline (single dose of 300 mg) did not affect the pharmacokinetics of theophylline. The effect of theophylline on the pharmacokinetics of citalopram was not evaluated.

Ketoconazole

Combined administration of racemic citalopram (40 mg) and ketoconazole (200 mg), a potent CYP3A4 inhibitor, decreased the C_{max} and AUC of ketoconazole by 21% and 10%, respectively, and did not significantly affect the pharmacokinetics of citalopram.

Ritonavir

Combined administration of a single dose of ritonavir (600 mg), both a CYP3A4 substrate and a potent inhibitor of CYP3A4, and escitalopram (20 mg) did not affect the pharmacokinetics of either ritonavir or escitalopram.

Triazolam

Combined administration of racemic citalopram (titrated to 40 mg/day for 28 days) and the CYP3A4 substrate triazolam (single dose of 0.25 mg) did not significantly affect the pharmacokinetics of either citalopram or triazolam.

Metoprolol

Administration of 20 mg/day escitalopram tablets for 21 days in healthy volunteers resulted in a 50% increase in C_{max} and 82% increase in AUC of the beta-adrenergic blocker metoprolol (given in a single dose of 100 mg). Increased metoprolol plasma levels have been associated with decreased cardioselectivity. Coadministration of escitalopram tablets and metoprolol had no clinically significant effects on blood pressure or heart rate.

Alcohol

Escitalopram did not potentiate the cognitive and motor effects of alcohol in a clinical trial. As with other psychotropic medications, the use of alcohol by patients taking escitalopram tablets are not recommended.

Warfarin

Administration of 40 mg/day racemic citalopram for 21 days did not affect the pharmacokinetics of warfarin, a CYP3A4 substrate. Prothrombin time was increased by 5%. The clinical significance of these findings is unknown.

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13 NONCLINICAL TOXICOLOGY

13.1 Carcinogenesis, Mutagenesis, Impairment of Fertility

Carcinogenesis
Racemic citalopram was administered in the diet to NMRU/BOM strain mice and CDBS WJ strain rats for 18 and 24 months, respectively. There was no evidence for carcinogenicity of racemic citalopram in mice receiving up to 240 mg/kg/day. There was an increased incidence of small intestine carcinomas in rats receiving 8 or 24 mg/kg/day racemic citalopram. A no-effect dose for this finding was not established. The relevance of these findings to humans is unknown.

Mutagenesis

Racemic citalopram was mutagenic in the *in vitro* bacterial reverse mutation assay (Ames test) at 2 of 5 bacterial strains (Salmonella TA98 and TA1537) in the absence of metabolic activation. It was clastogenic in the *in vitro* Chinese hamster lung cell assay for chromosomal aberrations in the presence and absence of metabolic activation. Racemic citalopram was not mutagenic in the *in vitro* mammalian forward gene mutation assay (HPRT) in mouse lymphoma cells or in a coupled *in vitro* vivo unscheduled DNA synthesis (UDS) assay in rat liver. It was not clastogenic in the *in vitro* chromosomal aberration assay in human lymphocytes or in two *in vivo* mouse micronucleus assays.

Impairment of Fertility

When racemic citalopram was administered orally to 16 male and 24 female rats prior to and throughout mating and gestation at doses of 32, 48, and 72 mg/kg/day, mating was decreased at all doses, and fertility was decreased at doses ≥ 32 mg/kg/day. Gestation duration was increased at 48 mg/kg/day.

13.2 Animal Toxicology and/or Pharmacology

Retinal Changes in Rats