SAMSCA® (tolvaptan)

HIGHLIGHTS OF PRESCRIBING INFORMATION
These highlights do not include all the information needed to use SAMSCA safely and effectively. See full prescribing information for SAMSCA.

SAMSCA® (tolvaptan) tablets for oral use
Initial U.S. Approval: 2009

WARNING: INITIATE AND RE-INITIATE IN A HOSPITAL AND MONITOR SERUM SODIUM
See full prescribing information for complete boxed warning.
- SAMSCA should be initiated and re-initiated in patients only in a hospital where serum sodium can be monitored closely.
- Too rapid correction of hyponatremia (e.g., >12 mEq/L/24 hours) can cause osmotic demyelination resulting in dysarthria, mutism, dysphagia, lethargy, affective changes, spastic quadriparesis, seizures, coma and death. In susceptible patients, including those with severe malnutrition, alcoholism or advanced liver disease, slower rates of correction may be advisable.

RECENT MAJOR CHANGES

Warnings and Precautions
- Too Rapid Correction of Serum Sodium Can Cause Serious Neurologic Sequelae (see BOXED WARNING) (5.1) 06/2017

INDICATIONS AND USAGE
SAMSCA is a selective vasopressin V1-receptor antagonist indicated for the treatment of clinically significant hypervolemic and euvoelemic hyponatremia (serum sodium <125 mEq/L or less marked hyponatremia that is symptomatic and has resisted correction with fluid restriction), including patients with heart failure and Syndrome of Inappropriate Antiidiuretic Hormone (SIADH) (1)

Important Limitations:
- Patients requiring intervention to raise serum sodium urgently to prevent or to treat serious neurological symptoms should not be treated with SAMSCA (1)
- It has not been established that SAMSCA provides a symptomatic benefit to patients (1)

DOSAGE AND ADMINISTRATION
- SAMSCA should be initiated and re-initiated in a hospital (2.1)
- The recommended starting dose is 15 mg once daily. Dosage may be increased at intervals ≥24 hr to 30 mg once daily, and to a maximum of 60 mg once daily as needed to raise serum sodium. (2.1)

DOSE AND ADMINISTRATION
- Tablets: 15 mg and 30 mg (3)

CONTRAINDICATIONS
- Need to raise serum sodium acutely (4.1)
- Patients who are unable to respond appropriately to thirst (4.2)
- Hypovolemic hyponatremia (4.3)
- Concomitant use of strong CYP 3A inhibitors (4.4)
- Anuria (4.5)
- Hypersensitivity (4.6)

WARNINGS/ PRECAUTIONS
- Liver injury: Limit treatment duration to 30 days. If hepatic injury is suspected, discontinue SAMSCA. Avoid use in patients with underlying liver disease (5.2)
- Dehydration and hypovolemia may require intervention (5.3)
- Avoid use with hypertonic saline (5.4)
- Avoid use with CYP 3A inducers and moderate CYP 3A inhibitors (5.5)
- Consider dose reduction if co-administered with P-gp inhibitors (5.5)
- Monitor serum potassium in patients with potassium ≥5 mEq/L or on drugs known to increase potassium (5.6)

ADVERSE REACTIONS
- Most common adverse reactions (≥5% placebo) are thirst, dry mouth, asthenia, constipation, polydipsia, polycystis, polyuria, and hyperglycemia (6.1)
- To report SUSPECTED ADVERSE REACTIONS, contact Otsuka at 1-877-726-7220 or FDA at 1-800-FDA-1088 (www.fda.gov/medwatch)

7 DRUG INTERACTIONS
7.1 Effects of Drugs on Tolvaptan
7.2 Effects of Tolvaptan on Other Drugs

8 USE IN SPECIFIC POPULATIONS
8.1 Pregnancy
8.2 Labor and Delivery
8.3 Nursing Mothers
8.4 Pediatric Use
8.5 Geriatric Use
8.6 Use in Patients with Hepatic Impairment
8.7 Use in Patients with Renal Impairment
8.8 Use in Patients with Congestive Heart Failure

10 OVERDOSAGE

11 DESCRIPTION

12 CLINICAL PHARMACOLOGY
12.1 Mechanism of Action
12.2 Pharmacodynamics
12.3 Pharmacokinetics

13 NONCLINICAL TOXICOLOGY
13.1 Carcinogenesis, Mutagenesis, Impairment of Fertility
13.2 Reproductive and Developmental Toxicology

14 CLINICAL STUDIES
14.1 Hyponatremia
14.2 Heart Failure

16 HOW SUPPLIED/STORAGE AND HANDLING

17 PATIENT COUNSELING INFORMATION

*Sections or subsections omitted from the full prescribing information are not listed.
1 INDICATIONS AND USAGE
SAMSCA® is indicated for the treatment of clinically significant hypervolemic and euvolemic hyponatremia (serum sodium <125 mEq/L or less marked hyponatremia that is symptomatic and has resolved correction with fluid restriction), including patients with heart failure and Syndrome of Inappropriate Antidiuretic Hormone (SIADH).

Important Limitations
Patients requiring intervention to raise serum sodium urgently to prevent or to treat serious neurological symptoms should not be treated with SAMSCA. It has not been established that raising serum sodium with SAMSCA provides a symptomatic benefit to patients.

2 DOSAGE AND ADMINISTRATION
2.1 Usual Dosage in Adults
Patients should be in a hospital for initiation and re-initiation of therapy to evaluate the therapeutic response and because too rapid correction of hyponatremia can cause osmotic demyelination resulting in dysarthria, mutism, dysphagia, lethargy, affective changes, spastic quadriparesis, seizures, coma and death.

The usual starting dose for SAMSCA is 15 mg administered once daily without regard to meals. Increase the dose to 30 mg once daily, after at least 24 hours, to a maximum of 60 mg once daily, as needed to achieve the desired level of serum sodium. Do not administer SAMSCA for more than 30 days to minimize the risk of liver injury [see Warnings and Precautions (5.2)].

During initiation and titration, frequently monitor for changes in serum electrolytes and volume. Avoid fluid restriction during the first 24 hours of therapy. Patients receiving SAMSCA should be advised that they can continue ingestion of fluid in response to thirst [see Warnings and Precautions (5.1)].

2.2 Drug Withdrawal
Following discontinuation from SAMSCA, patients should be advised to resume fluid restriction and should be monitored for changes in serum sodium and volume status.

2.3 Co-Administration with CYP 3A Inhibitors, CYP 3A Inducers and P-gp Inhibitors

CYP 3A Inhibitors
Tolvaptan is metabolized by CYP 3A, and use with strong CYP 3A inhibitors causes a marked (5-fold) increase in exposure [see Contraindications (4.4)]. The effect of moderate CYP 3A inhibitors on tolvaptan exposure has not been assessed. Avoid co-administration of SAMSCA and moderate CYP 3A inhibitors [see Warnings and Precautions (5.3), Drug Interactions (7.1)].

CYP 3A Inducers
Co-administration of SAMSCA with potent CYP 3A inducers (e.g., rifampin) reduces tolvaptan plasma concentrations by 85%. Therefore, the expected clinical effects of SAMSCA may not be observed at the recommended dose. Patient response should be monitored and the dose adjusted accordingly [see Warnings and Precautions (5.5), Drug Interactions (7.1)].

P-gp Inhibitors
Tolvaptan is a substrate of P-gp. Co-administration of SAMSCA with inhibitors of P-gp (e.g., cyclosporine) may necessitate a decrease in SAMSCA dose [see Warnings and Precautions (5.5), Drug Interactions (7.1)].

3 DOSAGE FORMS AND STRENGTHS
SAMSCA (tolvaptan) is available in 15 mg and 30 mg tablets [see How Supplied/Storage and Handling (16)].

4 CONTRAINDICATIONS
SAMSCA is contraindicated in the following conditions:

4.1 Urgent Need to Raise Serum Sodium Acutely
SAMSCA has not been studied in a setting of urgent need to raise serum sodium acutely.

4.2 Inability of the Patient to Sense or Appropriately Respond to Thirst
Patients who are unable to auto-regulate fluid balance are at substantially increased risk of incurring an overly rapid correction of serum sodium, hyponatremia and hypovolemia.

4.3 Hypovolemic Hyponatremia
Risks associated with worsening hypovolemia, including complications such as hypotension and renal failure, outweigh possible benefits.

4.4 Concomitant Use of Strong CYP 3A Inhibitors
Ketoconazole 200 mg administered with tolvaptan increased tolvaptan exposure by 5-fold. Larger doses would be expected to produce larger increases in tolvaptan exposure. There is not adequate experience to define the dose adjustment that would be needed to allow safe use of tolvaptan with strong CYP 3A inhibitors such as clarithromycin, ketoconazole, itraconazole, ritonavir, indinavir, nelfinavir, saquinavir, nefazodone, and telithromycin.

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4.5 Anuric Patients
In patients unable to make urine, no clinical benefit can be expected.

4.6 Hypersensitivity
SAMSCA is contraindicated in patients with hypersensitivity (e.g., anaphylactic shock, rash generalized) to tolvaptan or any component of the product [see Adverse Reactions (6.2)].

5 WARNINGS AND PRECAUTIONS
5.1 Too Rapid Correction of Serum Sodium Can Cause Serious Neurologic Sequelae (see BOXED WARNING)
Osmotic demyelination syndrome is a risk associated with too rapid correction of hyponatremia (e.g., >12 mEq/L/24 hours). Osmotic demyelination results in dysarthria, mutism, dysphagia, lethargy, affective changes, spastic quadriparesis, seizures, coma and death. In susceptible patients, including those with severe malnutrition, alcoholism or advanced liver disease, slower rates of correction may be advisable.

5.2 Liver Injury
SAMSCA can cause serious and potentially fatal liver injury. In a placebo-controlled and open label extension study of chronically administered tolvaptan in patients with autosomal dominant polycystic kidney disease, cases of serious liver injury attributed to tolvaptan were observed. An increased incidence of ALT greater than three times the upper limit of normal was associated with tolvaptan (42/958 or 4.4%) compared to placebo (5/848 or 1.0%). Cases of serious liver injury were generally observed starting 3 months after initiation of tolvaptan although elevations of ALT occurred prior to 3 months.

Patients with symptoms that may indicate liver injury, including fatigue, anorexia, right upper abdominal discomfort, dark urine or jaundice should discontinue treatment with SAMSCA. Limit duration of therapy with SAMSCA to 30 days. Avoid use in patients with underlying liver disease, including cirrhosis, because the ability to recover from liver injury may be impaired [see Adverse Reactions (6.1)].

5.3 Dehydration and Hypovolemia
SAMSCA therapy induces copious diuresis, which is normally partially offset by fluid intake. Dehydration and hypovolemia can occur, especially in potentially volume-depleted patients receiving diuretics or those who are fluid restricted. In multiple-dose, placebo-controlled trials in which 607 hyponatremic patients were treated with tolvaptan, the incidence of dehydration was 3.3% for tolvaptan and 1.5% for placebo-treated patients. In patients receiving SAMSCA who develop medically significant signs or symptoms of hypovolemia, interrupt or discontinue SAMSCA therapy and provide supportive care with careful management of vital signs, fluid balance and electrolytes. Fluid restriction during therapy with SAMSCA may increase the risk of dehydration and hypovolemia. Patients receiving SAMSCA should continue ingestion of fluid in response to thirst.

5.4 Co-administration with Hypertonic Saline
Concomitant use with hypertonic saline is not recommended.

5.5 Drug Interactions
Other Drugs Affecting Exposure to Tolvaptan
CYP 3A Inhibitors
Tolvaptan is a substrate of CYP 3A. CYP 3A inhibitors can lead to a marked increase in tolvaptan concentrations [see Dosage and Administration (2.3), Drug Interactions (7.1)]. Do not use SAMSCA with strong inhibitors of CYP 3A [see Contraindications (4.4)] and avoid concomitant use with moderate CYP 3A inhibitors.

CYP 3A Inducers
Avoid co-administration of CYP 3A inducers (e.g., rifampin, rifabutin, rifapentin, barbiturates, phenytoin, carbamazine, St. John’s Wort) with SAMSCA, as this can lead to a reduction in the plasma concentration of tolvaptan and decreased effectiveness of SAMSCA treatment. If co-administered with CYP 3A inducers, the dose of SAMSCA may need to be increased [see Dosage and Administration (2.3), Drug Interactions (7.1)].

P-gp Inhibitors
The dose of SAMSCA may have to be reduced when SAMSCA is co-administered with P-gp inhibitors, e.g., cyclosporine [see Dosage and Administration (2.3), Drug Interactions (7.1)].
SAMSCA® (tolvaptan)

5.6 Hyperkalemia or Drugs that Increase Serum Potassium
Treatment with tolvaptan is associated with an acute reduction of the extracellular fluid volume which could result in increased serum potassium. Serum potassium levels should be monitored after initiation of tolvaptan treatment in patients with a serum potassium >5 mEq/L as well as those who are receiving drugs known to increase serum potassium levels.

6 ADVERSE REACTIONS

6.1 Clinical Trials Experience
Because clinical trials are conducted under widely varying conditions, adverse reactions rates observed in the clinical trials of a drug cannot be directly compared to rates in the clinical trials of another drug and may not reflect the rates observed in practice. The adverse event information from clinical trials does, however, provide a basis for identifying the adverse events that appear to be related to drug use and for approximating rates.

In multiple-dose, placebo-controlled trials, 607 hyponatremic patients (serum sodium <135 mEq/L) were treated with SAMSCA. The mean age of these patients was 62 years; 70% of patients were male and 82% were Caucasian. One hundred eighty nine (189) tolvaptan-treated patients had a serum sodium <130 mEq/L, and 52 patients had a serum sodium <125 mEq/L. Hyponatremia was attributed to cirrhosis in 17% of patients, heart failure in 68% and SIADH/other in 16%. Of these patients, 223 were treated with the recommended dose titration (15 mg titrated to 60 mg as needed to raise serum sodium). Overall, over 4,000 patients have been treated with oral doses of tolvaptan in open-label or placebo-controlled clinical trials. Approximately 650 of these patients had hyponatremia; approximately 219 of these hyponatremic patients were treated with tolvaptan for 6 months or more.

The most common adverse reactions (incidence ≥5% more than placebo) seen in two 30-day, double-blind, placebo-controlled hyponatremia trials in which tolvaptan was administered in titrated doses (15 mg to 60 mg once daily) were thirst, dry mouth, asthenia, constipation, pollakiuria or polyuria and hyperglycemia. In these trials, 10% (23/223) of tolvaptan-treated patients discontinued treatment because of an adverse event, compared to 12% (26/220) of placebo-treated patients; no adverse reaction resulting in discontinuation of trial medication occurred at an incidence of >1% in tolvaptan-treated patients.

Table 1 lists the adverse reactions reported in tolvaptan-treated patients with hyponatremia (serum sodium <135 mEq/L) and at a rate at least 2% greater than placebo-treated patients in two 30-day, double-blind, placebo-controlled trials. In these studies, 223 patients were exposed to tolvaptan (starting dose 15 mg, titrated to 30 and 60 mg as needed to raise serum sodium). Adverse events resulting in death in these trials were 6% in tolvaptan-treated patients and at a rate at least 2% greater than placebo-treated patients (serum sodium <135 mEq/L) and at a rate greater than placebo (N = 607 tolvaptan; N = 518 placebo) or in <2% of patients in an uncontrolled trial of patients with hyponatremia (N = 111) and are not mentioned elsewhere in the label.

Blood and Lymphatic System Disorders: Disseminated intravascular coagulation
Cardiac Disorders: Intracardiac thrombus, ventricular fibrillation
Investigations: Prothrombin time prolonged
Gastrointestinal Disorders: Ischemic colitis
Metabolism and Nutrition Disorders: Diabetic ketoacidosis
Musculoskeletal and Connective Tissue Disorders: Rhabdomyolysis
Nervous System: Cerebrovascular accident
Renal and Urinary Disorders: Urethral hemorrhage
Reproductive System and Breast Disorders (female): Vaginal hemorrhage
Respiratory, Thoracic, and Mediastinal Disorders: Pulmonary embolism, respiratory failure
Vascular disorder: Deep vein thrombosis

6.2 Postmarketing Experience
The following adverse reactions have been identified during post-approval use of SAMSCA. Because these reactions are reported voluntarily from a population of an unknown size, it is not always possible to reliably estimate their frequency or establish a causal relationship to drug exposure.

Neurologic: Osmotic demyelination syndrome
Investigations: Hyponatremia
Removal of excess free body water increases serum osmolality and serum sodium concentrations. All patients treated with tolvaptan, especially those whose serum sodium levels become normal, should continue to be monitored to ensure serum sodium remains within normal limits. If hyponatremia is observed, management may include dose decreases or interruption of tolvaptan treatment, combined with modification of free-water intake or interruption.

During clinical trials of hyponatremic patients, hyponatremia was reported as an adverse event in 0.7% of patients receiving tolvaptan vs. 0.6% of patients receiving placebo; analysis of laboratory values demonstrated an incidence of hyponatremia of 1.7% in patients receiving tolvaptan vs. 0.8% in patients receiving placebo.

Immune System Disorders: Hypersensitivity reactions including anaphylactic shock and rash generalized [see Contraindications (4.6)].

7 DRUG INTERACTIONS

7.1 Effects of Drugs on Tolvaptan
Ketokonazole and Other Strong CYP 3A Inhibitors
SAMSCA is metabolized primarily by CYP 3A. Ketokonazole is a strong inhibitor of CYP 3A and also an inhibitor of P-gp. Co-administration of SAMSCA and ketokonazole 200 mg daily results in a 5-fold increase in exposure to tolvaptan. Co-administration of SAMSCA with 400 mg ketokonazole daily or with other strong CYP 3A inhibitors (e.g., clarithromycin, itraconazole, telithromycin, saquinavir, nefazodone) at the highest labeled dose would be expected to cause an even greater increase in tolvaptan exposure. Thus, SAMSCA and strong CYP 3A inhibitors should not be co-administered [see Dosage and Administration (2.3) and Contraindications (4.4)].

Grapefruit Juice
Co-administration of grapefruit juice and SAMSCA results in a 1.8-fold increase in exposure to tolvaptan [see Dose and Administration (2.3) and Warnings and Precautions (5.5)].

P-gp Inhibitors
Reduction in the dose of SAMSCA may be required in patients concomitantly treated with P-gp inhibitors, such as e.g., cyclosporine, based on clinical response [see Dose and Administration (2.3) and Warnings and Precautions (5.5)].

Rifampin and Other CYP 3A Inducers
Rifampin is an inducer of CYP 3A and P-gp. Co-administration of rifampin and SAMSCA reduces exposure to tolvaptan by 85%. Therefore, the expected clinical effects of SAMSCA in the presence of rifampin and other inducers (e.g., rifabutin, rifapentin, barbiturates, phenytoin, carbamazepine and St. John's Wort) may not be observed at the usual dose levels of SAMSCA. The dose of SAMSCA may have to be increased [Doseage and Administration (2.3) and Warnings and Precautions (5.5)].

Lovastatin, Diginox, Furusemide, and Hydrochlorothiazide
Co-administration oflovastatin, diginox, furusemide, and hydrochlorothiazide with SAMSCA has no clinically relevant impact on the exposure to tolvaptan.

7.2 Effects of Tolvaptan on Other Drugs
Diginox
Diginox is a P-gp substrate. Co-administration of SAMSCA with diginox increased diginox AUC by 20% and Cmax by 30%.

Table 1. Adverse Reactions (>2% more than placebo) in Tolvaptan-Treated Patients in Double-Blind, Placebo-Controlled Hyponatremia Trials

<table>
<thead>
<tr>
<th>System Organ Class MedDRA Preferred Term</th>
<th>Tolvaptan 15 mg/day-60 mg/day (N = 223)</th>
<th>Placebo (N = 220)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gastrointestinal Disorders</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry mouth</td>
<td>28 (13)</td>
<td>9 (4)</td>
</tr>
<tr>
<td>Constipation</td>
<td>16 (7)</td>
<td>4 (2)</td>
</tr>
<tr>
<td>General Disorders and Administration Site Conditions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thirsta</td>
<td>35 (16)</td>
<td>11 (5)</td>
</tr>
<tr>
<td>Aethenia</td>
<td>19 (9)</td>
<td>9 (4)</td>
</tr>
<tr>
<td>Pyrexia</td>
<td>9 (4)</td>
<td>2 (1)</td>
</tr>
<tr>
<td>Metabolism and Nutrition Disorders</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hyperglycemiaa</td>
<td>14 (6)</td>
<td>2 (1)</td>
</tr>
<tr>
<td>Anorexiaa</td>
<td>8 (4)</td>
<td>2 (1)</td>
</tr>
<tr>
<td>Renal and Urinary Disorders</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pollakiuria or polyuria</td>
<td>25 (11)</td>
<td>7 (3)</td>
</tr>
</tbody>
</table>

The following terms are subsumed under the referenced ADR in Table 1:
* polydipsia; † diabetes mellitus; ‡ decreased appetite; § urine output increased, micturition urgency, nocturia

In a subgroup of patients with hyponatremia (N = 475, serum sodium <135 mEq/L) enrolled in a double-blind, placebo-controlled trial (mean duration of treatment was 9 months) of patients with worsening heart failure, the following adverse reactions occurred in tolvaptan-treated patients at a rate at least 2% greater than placebo: mortality (42% tolvaptan, 38% placebo), nausea (21% tolvaptan, 16% placebo), thirst (12% tolvaptan, 2% placebo), dry mouth (7% tolvaptan, 2% placebo) and polyuria or pollakiuria (4% tolvaptan, 1% placebo).

Gastrointestinal bleeding in patients with cirrhosis
In patients with cirrhosis treated with tolvaptan in the hyponatremia trials, gastrointestinal bleeding was reported in 6 out of 63 (10%) tolvaptan-treated patients and 1 out of 57 (2%) placebo-treated patients.
SAMSCA® (tolvaptan)

Warfarin, Amiodarone, Furosemide, and Hydrochlorothiazide
Co-administration of tolvaptan does not appear to alter the pharmacokinetics of warfarin, furosemide, hydrochlorothiazide, or amiodarone (or its active metabolite, desethylamiodarone) to a clinically significant degree.

Lovastatin
SAMSCA is a weak inhibitor of CYP 3A. Co-administration of lovastatin and SAMSCA increases the exposure to lovastatin and its active metabolite lovastatin-β-hydroxyacid by factors of 1.4 and 1.5, respectively. This is not a clinically relevant change.

Pharmacodynamic Interactions
Tolvaptan produces a greater 24 hour urine volume/excretion rate than does furosemide or hydrochlorothiazide. Concomitant administration of tolvaptan with furosemide or hydrochlorothiazide resulted in a 24 hour urine volume/excretion rate that is similar to the rate after tolvaptan administration alone.

Although specific interaction studies were not performed, in clinical studies tolvaptan was used concomitantly with beta-blockers, angiotensin receptor blockers, angiotensin converting enzyme inhibitors and potassium sparing diuretics. Adverse reactions of hyperkalemia were approximately 1-2% higher when tolvaptan was administered with angiotensin receptor blockers, angiotensin converting enzyme inhibitors and potassium sparing diuretics compared to administration of these medications with placebo. Serum potassium levels should be monitored during concomitant drug therapy.

As a V2-receptor antagonist, tolvaptan may interfere with the V2-agonist activity of desmopressin (dDAVP).

In a male subject with mild Von Willebrand (vW) disease, intravenous infusion of dDAVP 2 hours after administration of oral tolvaptan did not produce the expected increases in vW Factor Antigen or Factor VIII activity. It is not recommended to administer SAMSCA with a V2-agonist.

8 USE IN SPECIFIC POPULATIONS
There is no need to adjust dose based on age, gender, race, or cardiac function [see Clinical Pharmacology (12.3)].

8.1 Pregnancy
Pregnancy Category C
There are no adequate and well controlled studies of SAMSCA use in pregnant women. In animal studies, cleft palate, brachymelia, microphthalmia, skeletal malformations, decreased fetal weight, delayed fetal ossification, and embryo-fetal death occurred. SAMSCA should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

In embryo-fetal development studies, pregnant rats and rabbits received oral tolvaptan during organogenesis. Rats received 2 to 162 times the maximum recommended human dose (MRHD) of tolvaptan (on a body surface area basis). Reduced fetal weights and increased fetal malformations occurred at 162 times the MRHD. Signs of maternal toxicity (reduction in body weight gain and food consumption) occurred at 16 and 162 times the MRHD. When pregnant rabbits received oral tolvaptan at 32 to 324 times the MRHD (on a body surface area basis), there were reductions in maternal body weight gain and food consumption at all doses, and increased abortions at the mid and high doses (about 97 and 324 times the MRHD). At 324 times the MRHD, there were increased rates of embryo-fetal death, fetal microphthalmia, open eyelids, cleft palate, brachymelia and skeletal malformations [see Nonclinical Toxicology (13.3)].

8.2 Labor and Delivery
The effect of SAMSCA on labor and delivery in humans is unknown.

8.3 Nursing Mothers
It is not known whether SAMSCA is excreted into human milk. Tolvaptan is excreted into the milk of lactating rats. Because many drugs are excreted into human milk and because of the potential for serious adverse reactions in nursing infants from SAMSCA, a decision should be made to discontinue nursing or SAMSCA, taking into consideration the importance of SAMSCA to the mother.

8.4 Pediatric Use
Safety and effectiveness of SAMSCA in pediatric patients have not been established.

8.5 Geriatric Use
Of the total number of hypertensive subjects treated with SAMSCA in clinical studies, 42% were 65 and over, while 19% were 75 and over. No overall differences in safety or effectiveness were observed between these subjects and younger subjects, and other reported clinical experience has not identified differences in responses between the elderly and younger patients, but greater sensitivity of some older individuals cannot be ruled out. Increasing age has no effect on tolvaptan plasma concentrations.

8.6 Use in Patients with Hepatic Impairment
Moderate and severe hepatic impairment do not affect tolvaptan exposure to a clinically relevant extent. Avoid use of tolvaptan in patients with underlying liver disease.

8.7 Use in Patients with Renal Impairment
No dose adjustment is necessary based on renal function. There are no clinical trial data in patients with CrCl <10 mL/min, and, because drug effects on serum sodium levels are likely lost at very low levels of renal function, use in patients with a CrCl <10 mL/min is not recommended. No benefit can be expected in patients who are anuric [see Contraindications (4.5) and Clinical Pharmacology (12.3)].

8.8 Use in Patients with Congestive Heart Failure
The exposure to tolvaptan in patients with congestive heart failure is not clinically relevantly increased. No dose adjustment is necessary.

SAMSCA® (tolvaptan)

10 OVERDOSAGE
Single oral doses up to 480 mg and multiple doses up to 300 mg once daily for 5 days have been well tolerated in studies in healthy subjects. There is no specific antidote for tolvaptan intoxication. The signs and symptoms of an acute overdose can be anticipated to be those of excessive pharmacologic effect: a rise in serum sodium concentration, polyaquic, thirst, and dehydration/hyponatremia.

The oral LD50 of tolvaptan in rats and dogs is >2000 mg/kg. No mortality was observed in rats or dogs following a single oral dose of 3000 mg/kg (maximum feasible oral dose). A single oral dose of 2000 mg/kg was lethal in mice, and symptoms of toxicity in affected mice included decreased locomotor activity, staggering gait, tremor and hypothermia.

If overdose occurs, estimation of the severity of poisoning is an important first step. A thorough history and details of overdose should be obtained, and a physical examination should be performed. The possibility of multiple drug involvement should be considered.

Treatment should involve symptomatic and supportive care, with respiratory, ECG and blood pressure monitoring and water/electrolyte supplements as needed. A profuse and prolonged aquaretic syndrome should be anticipated, which, if not matched by oral fluid ingestion, should be replaced with intravenous hypertonic fluids, while closely monitoring electrolytes and fluid balance.

ECG monitoring should begin immediately and continue until ECG parameters are within normal ranges. Dialysis may not be effective in removing tolvaptan because of its high binding affinity for human plasma protein (>99%). Close medical supervision and monitoring should continue until the patient recovers.

11 DESCRIPTION
Tolvaptan is (±)-4’-[(7-chloro-2,3,4,5-tetrahydro-5-hydroxy-1H-1-benzazepin-1-y) carbonyl]-o-tolu-r-toluidide. The empirical formula is C26H25ClN2O3. Molecular weight is 448.94. The chemical structure is:

![Chemical Structure of Tolvaptan](image)

SAMSCA tablets for oral use contain 15 mg or 30 mg of tolvaptan. Inactive ingredients include corn starch, hydroxypropyl cellulose, lactose monohydrate, low-substituted hydroxypropyl cellulose, magnesium stearate and microcrystalline cellulose and FD&C Blue No. 2 Aluminum Lake as colorant.

12 CLINICAL PHARMACOLOGY

12.1 Mechanism of Action
Tolvaptan is a selective vasopressin V2-receptor antagonist with an affinity for the V2-receptor that is 1.8 times that of native arginine vasopressin (AVP). Tolvaptan affinity for the V2-receptor is 29 times greater than for the V1a-receptor. When taken orally, 15 to 60 mg doses of tolvaptan antagonize the effect of vasopressin and cause an increase in urine water excretion that results in an increase in free water clearance (aquareasis), a decrease in urine osmolality, and a resulting increase in serum sodium concentrations. Urinary excretion of sodium and potassium and plasma potassium concentrations are not significantly changed. Tolvaptan metabolites have no or weak antagonist activity for human V2 receptors compared with tolvaptan.

Plasma concentrations of native AQP may increase (avg: 2-9 pg/mL) with tolvaptan administration.

12.2 Pharmacodynamics
In healthy subjects receiving a single dose of SAMSCA 60 mg, the onset of the aquaretic and sodium increasing effects occurs within 2 to 4 hours post-dose. A peak effect of about a 6 mg increase in serum sodium and about 9 mL/min increase in urine excretion rate is observed between 4 and 8 hours post-dose, thus, the pharmacological activity lags behind the plasma concentrations of tolvaptan. About 80% of the peak effect on serum sodium is sustained at 24 hours post-dose, but the urinary excretion rate is no longer elevated by this time. Doses above 60 mg tolvaptan do not increase aquareasis or serum sodium further. The effects of tolvaptan in the recommended dose range of 15 to 60 mg once daily appear to be limited to aquareasis and the resulting increase in sodium concentration.

In a parallel-arm, double-blind (for tolvaptan and placebo), placebo- and positive-controlled, multiple dose study of the effect of tolvaptan on the QT interval, 172 healthy subjects were randomized to tolvaptan 30 mg, tolvaptan 300 mg, placebo, or moxifloxacin 400 mg once daily. At both the 30 mg and 300 mg doses, no significant effect of administering tolvaptan on the QT interval was detected on Day 1 and Day 5. At the 300 mg dose, peak tolvaptan plasma concentrations were approximately 4-fold higher than the peak concentrations following a 30 mg dose. Moxifloxacin increased the QT interval by 12 ms at 2 hours after dosing on Day 1 and 17 ms at 1 hour after dosing on Day 5, indicating that the study was adequately designed and conducted to detect tolvaptan’s effect on the QT interval, had an effect been present.

12.3 Pharmacokinetics
In healthy subjects the pharmacokinetics of tolvaptan after single doses of up to 480 mg and multiple doses up to 300 mg once daily have been examined. Area under the curve (AUC) increases proportionally with dose. After administration of doses ≥60 mg, Cmax increases less than proportionally with dose. The pharmacokinetic properties of tolvaptan are stereospecific, with a steady-state ratio of the S(-) to the R(+)-enantiomer of about 3. The absolute bioavailability of tolvaptan is unknown. At least 40% of the dose is absorbed
as tolvaptan or metabolites. Peak concentrations of tolvaptan are observed between 2 and 4 hours post-dose. Food does not impact the bioavailability of tolvaptan. In vitro data indicate that tolvaptan is a substrate and inhibitor of P-gp. Tolvaptan is highly plasma protein bound (99%) and distributed into an apparent volume of distribution of about 3 L/kg. Tolvaptan is eliminated entirely by non-renal routes and mainly, if not exclusively, metabolized by CYP 3A. After oral dosing, clearance is about 4 mL/min/kg and the terminal phase half-life is about 12 hours. The accumulation factor of tolvaptan with the once-daily regimen is 1.3 and the trough concentrations amount to ≤16% of the peak concentrations, suggesting a dominant half-life somewhat shorter than 12 hours. There is marked inter-subject variation in peak and average exposure to tolvaptan with a percent coefficient of variation ranging between 30 and 60%.

In patients with hyponatremia of any origin the clearance of tolvaptan is reduced to about 2 mL/min/kg. Moderate or severe hepatic impairment or congestive heart failure decrease the clearance and increase the volume of distribution of tolvaptan, but the respective changes are not clinical relevant. Exposure and response to tolvaptan in subjects with creatinine clearance ranging between 79 and 10 mL/min and patients with normal renal function are not different. In a study in patients with creatinine clearances ranging from 10-124 mL/min administered a single dose of 60 mg tolvaptan, AUC and Cmax of plasma tolvaptan were less than doubled in patients with severe renal impairment relative to the controls. The peak increase in serum sodium was 5-6 mEq/L, regardless of renal function, but the onset and offset of tolvaptan’s effect on serum sodium were slower in patients with severe renal impairment [see Use in Special Populations (8.7)].

13 NONCLINICAL TOXICOLOGY

13.1 Carcinogenesis, Mutagenesis, Impairment of Fertility

Up to two years of oral administration of tolvaptan to male and female rats at doses up to 1000 mg/kg/day (162 times the maximum recommended human dose [MRHD] on a body surface area basis), to male mice at doses up to 60 mg/kg/day (5 times the MRHD) and to female mice at doses up to 100 mg/kg/day (8 times the MRHD) did not increase the incidence of tumors. Tolvaptan tested negative for genotoxicity in in vitro (bacterial reverse mutation assay and chromosomal aberration test in Chinese hamster lung fibroblast cells) and in vivo (rat micronucleus assay) test systems.

In a fertility study in which male and female rats were orally administered tolvaptan at 100, 300 or 1000 mg/kg/day, the highest dose level was associated with significantly fewer corpora lutea and implants than control.

13.3 Reproductive and Developmental Toxicology

In pregnant rats, oral administration of tolvaptan at a dose of 10, 100 and 1000 mg/kg/day during organogenesis was associated with a reduction in maternal body weight gain and food consumption at 100 and 1000 mg/kg/day, and reduced fetal weight and delayed ossification of fetuses at 1000 mg/kg/day (162 times the MRHD on a body surface area basis). Oral administration of tolvaptan at 100, 300 and 1000 mg/kg/day to pregnant rabbits during organogenesis was associated with reductions in maternal body weight gain and food consumption at all doses, and abortions at mid- and high-doses. At 1000 mg/kg/day (324 times the MRHD), increased incidences of embryo-fetal death, fetal microphthalmia, open eyelids, cleft palate, brachymelia and skeletal malformations were observed. There are no adequate and well-controlled studies of SAMSCA in pregnant women. SAMSCA should be used in pregnancy only if the potential benefit justifies the risk to the fetus.

14 CLINICAL STUDIES

14.1 Hyponatremia

In two double-blind, placebo-controlled, multi-center studies (SALT-1 and SALT-2), a total of 424 patients with euovolemic or hypervolemic hyponatremia (serum sodium <135 mEq/L) resulting from a variety of underlying causes (heart failure, liver cirrhosis, syndrome of inappropriate antidiuretic hormone [SIADH] and others) were treated for 30 days with tolvaptan or placebo, then followed for an additional 7 days after withdrawal. Symptomatic patients, patients likely to require saline therapy during the course of therapy, patients with acute and transient hyponatremia associated with head trauma or postoperative state and patients with hyponatremia due to primary polydipsia, uncontrolled adrenal insufficiency or uncontrolled hypothyroidism were excluded. Patients were randomized to receive either placebo (N = 220) or tolvaptan (N = 223) at an initial oral dose of 15 mg once daily. The mean serum sodium concentration at study entry was 129 mEq/L. Fluid restriction was to be avoided if possible during the first 24 hours of therapy to avoid overly rapid correction of serum sodium, and during the first 24 hours of therapy 87% of patients had no fluid restriction. Thereafter, patients could resume or initiate fluid restriction (defined as daily fluid intake of ≤1 liter per day) as clinically indicated.

The dose of tolvaptan could be increased at 24 hour intervals to 30 mg once daily, then to 60 mg once daily, until either the maximum dose of 60 mg or normonatremia (serum sodium >135 mEq/L) was reached. Serum sodium concentrations were determined at 8 hours after study drug initiation and daily up to 72 hours, within which time titration was typically completed. Tolvaptan was maintained for 28 days in additional sodium assessments on Days 11, 18, 25 and 30. On the day of study discontinuation, all patients resumed previous therapies for hyponatremia and were reevaluated 7 days later. The primary endpoint for these studies was the average daily AUC for change in serum sodium from baseline to Day 4 and baseline to Day 30 in patients with a serum sodium less than 135 mEq/L. Compared to placebo, tolvaptan caused a statistically greater increase in serum sodium (p <0.001) during both periods in both studies (see Table 2). For patients with a serum sodium of <130 mEq/L or <125 mEq/L the effects at Day 4 and Day 30 remained significant (see Table 2). This effect was also seen across all disease etiology subsets (e.g., CHF, cirrhosis, SIADH/other).
**SAMSCA® (tolvaptan)**

**16 HOW SUPPLIED/STORAGE AND HANDLING**

**How Supplied**

SAMSCA® (tolvaptan) tablets are available in the following strengths and packages.

SAMSCA 15 mg tablets are non-scored, blue, triangular, shallow-convex, debossed with “OTSUKA” and “15” on one side.

Blisters of 10  
NDC 59148-020-50

SAMSCA 30 mg tablets are non-scored, blue, round, shallow-convex, debossed with “OTSUKA” and “30” on one side.

Blisters of 10  
NDC 59148-021-50

**Storage and Handling**

Store at 25°C (77°F), excursions permitted between 15°C and 30°C (59°F to 86°F) [see USP controlled Room Temperature].

Keep out of reach of children.

**17 PATIENT COUNSELING INFORMATION**

As a part of patient counseling, healthcare providers must review the SAMSCA Medication Guide with every patient [see FDA-Approved Medication Guide].

**Concomitant Medication**

Advise patients to inform their physician if they are taking or plan to take any prescription or over-the-counter drugs since there is a potential for interactions.

**Strong and Moderate CYP 3A inhibitors and P-gp inhibitors**

Advise patients to inform their physician if they use strong (e.g., ketoconazole, itraconazole, clarithromycin, telithromycin, neflinavir, saquinavir, indinavir, ritonavir) or moderate CYP 3A inhibitors (e.g., aprepitant, erythromycin, diltiazem, verapamil, fluconazole) or P-gp inhibitors (e.g., cyclosporine) [see Dosage and Administration (2.3), Contraindications (4.4), Warnings and Precautions (5.5) and Drug Interactions (7.1)].

**Nursing**

Advise patients not to breastfeed an infant if they are taking SAMSCA [see Use In Specific Populations (8.3)].

Manufactured by Otsuka Pharmaceutical Co., Ltd., Tokyo, 101-8535 Japan

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**14.2 Heart Failure**

In a phase 3 double-blind, placebo-controlled study (EVEREST), 4133 patients with worsening heart failure were randomized to tolvaptan or placebo as an adjunct to standard of care. Long-term tolvaptan treatment (mean duration of treatment of 0.75 years) had no demonstrated effect, either favorable or unfavorable, on all-cause mortality (HR [95% CI]: 0.98 [0.9, 1.1]) or the combined endpoint of CV mortality or subsequent hospitalization for worsening HF (HR [95% CI]: 1.0 [0.9, 1.1]).
MEDICATION GUIDE
SAMSCA® (sam-sca)
tolvaptan Tablets

Read the Medication Guide that comes with SAMSCA before you take it and each time you get a new prescription. There may be new information. This Medication Guide does not take the place of talking to your healthcare provider about your medical condition or your treatment. Share this important information with members of your household.

What is the most important information I should know about SAMSCA?

1) SAMSCA may make the salt (sodium) level in your blood rise too fast. This can increase your risk of a serious condition called osmotic demyelination syndrome (ODS). ODS can lead to coma or death. ODS can also cause new symptoms such as:
   - trouble speaking
   - swallowing trouble or feeling like food or liquid gets stuck while swallowing
   - drowsiness
   - confusion
   - mood changes
   - trouble controlling body movement (involuntary movement) and weakness in muscles of the arms and legs
   - seizures

You or a family member should tell your healthcare provider right away if you have any of these symptoms even if they begin later in treatment. Also tell your healthcare provider about any other new symptoms while taking SAMSCA.

You may be more at risk for ODS if you have:
   - liver disease
   - not eaten enough for a long period of time (malnourished)
   - very low sodium level in your blood
   - been drinking large amounts of alcohol for a long period of time (chronic alcoholism)

To lessen your risk of ODS while taking SAMSCA:
   - Treatment with SAMSCA should be started and re-started only in a hospital, where the sodium levels in your blood can be checked closely.
   - Do not take SAMSCA if you can not tell if you are thirsty.
   - To prevent losing too much body water (dehydration), have water available to drink at all times while taking SAMSCA. Unless your healthcare provider tells you otherwise, drink when you are thirsty.
   - If your healthcare provider tells you to keep taking SAMSCA after you leave a hospital, it is important that you do not stop and re-start SAMSCA on your own. You may need to go back to a hospital to re-start SAMSCA. Talk to your healthcare provider right away if you stop taking SAMSCA for any reason.
   - It is important to stay under the care of your healthcare provider while taking SAMSCA and follow their instructions.

2) SAMSCA may cause liver problems, including life-threatening liver failure. SAMSCA should not be taken for more than 30 days. Tell your doctor right away if you develop or have worsening of any of these signs and symptoms of liver problems:
   - Loss of appetite, nausea, vomiting
   - Fever, feeling unwell, unusual tiredness
   - Itching
   - Yellowing of the skin or the whites of the eyes (jaundice)
   - Unusual darkening of the urine
   - Right upper stomach area pain or discomfort

To lessen your risk of ODS while taking SAMSCA:
   - tell your healthcare provider about any other new symptoms while taking SAMSCA.

What should I tell my healthcare provider before taking SAMSCA?

Tell your healthcare provider about all your medical conditions, including if you:
   - have kidney problems and your body can not make urine.
   - have liver problems
   - can not feel if you are thirsty. See “What is the most important information I should know about SAMSCA?”
   - have any allergies. See the end of this Medication Guide for a list of the ingredients in SAMSCA.
   - are pregnant or plan to become pregnant. It is not known if SAMSCA will harm your unborn baby.
   - are breast-feeding. It is not known if SAMSCA passes into your breast milk. You and your healthcare provider should decide if you will take SAMSCA or breast-feed. You should not do both.
   - are taking desmopressin (dDAVP).

Tell your healthcare provider about all the medicines you take, including prescription and non-prescription medicines, vitamins, and herbal supplements.

Using SAMSCA with certain medicines could cause you to have too much SAMSCA in your blood. See “Who should not take SAMSCA?” SAMSCA may affect the way other medicines work, and other medicines may affect how SAMSCA works.

Know the medicines you take. Keep a list of them and show it to your healthcare provider and pharmacist when you get a new medicine.

What is SAMSCA?

SAMSCA is a prescription medicine used to help increase low sodium levels in the blood, in adults with conditions such as heart failure, and certain hormone imbalances. SAMSCA helps raise salt levels in your blood by removing extra body water as urine.

It is not known if SAMSCA is safe or works in children.

Who should not take SAMSCA?

Do not take SAMSCA if:
   - you are allergic to tolvaptan or any of the ingredients in SAMSCA. See the end of this Medication Guide for a complete list of ingredients in SAMSCA.
   - the sodium level in your blood must be increased right away.
   - you do not replace fluids by drinking or you can not feel if you are thirsty.
   - you are dizy, faint, or your kidneys are not working normally because you have lost too much body fluid.
   - you take certain medicines. These medicines could cause you to have too much SAMSCA in your blood:
     - the antibiotic medicines, clarithromycin (Biaxin, Biaxin XL) or telithromycin (Ketek)
     - the antifungal medicines, ketoconazole (Nizoral) or itraconazole (Sporanox)
     - the anti-HIV medicines, ritonavir (Kaletra, Norvir), indinavir (Crixivan), nelfinavir (Viracept), and saquinavir (Invirase)
     - the antidepressant medicine, nefazodone hydrochloride
   - your body is not able to make urine. SAMSCA will not help your condition.
SAMSCA® (tolvaptan)

How should I take SAMSCA?

• See “What is the most important information I should know about SAMSCA?”
• Take SAMSCA exactly as prescribed by your healthcare provider.
• Take SAMSCA one time each day.
• You can take SAMSCA with or without food.
• Do not drink grapefruit juice during treatment with SAMSCA. This could cause you to have too much SAMSCA in your blood.
• Certain medicines or illnesses may keep you from drinking fluids or may cause you to lose too much body fluid, such as vomiting or diarrhea. If you have these problems, call your healthcare provider right away.
• Do not miss or skip doses of SAMSCA. If you miss a dose, take it as soon as you remember. If it is near the time of the next dose, skip the missed dose. Just take the next dose at your regular time. Do not take 2 doses at the same time.
• If you take too much SAMSCA, call your healthcare provider right away. If you take an overdose of SAMSCA, you may need to go to a hospital.
• If your healthcare provider tells you to stop taking SAMSCA, follow their instructions about limiting the amount of fluid you should drink.

What are the possible side effects of SAMSCA? SAMSCA can cause serious side effects including:

• See “What is the most important information I should know about SAMSCA?”
• Loss of too much body fluid (dehydration). Tell your healthcare provider if you:
  • have vomiting or diarrhea, and cannot drink normally.
  • feel dizzy or faint. These may be symptoms that you have lost too much body fluid.

Call your healthcare provider right away, if you have any of these symptoms.

The most common side effects of SAMSCA are:

• thirst
• dry mouth
• weakness
• constipation
• making large amounts of urine and urinating often
• increased blood sugar levels

These are not all the possible side effects of SAMSCA. Talk to your healthcare provider about any side effect that bothers you or that does not go away while taking SAMSCA.

Call your doctor for medical advice about side effects. You may report side effects to FDA at 1-800-FDA-1088.

SAMSCA® (tolvaptan)

How should I store SAMSCA?

Store SAMSCA between 59 °F to 86 °F (15 °C to 30 °C).

Keep SAMSCA and all medicines out of the reach of children.

General Information about SAMSCA

Medicines are sometimes prescribed for purposes other than those listed in a Medication Guide. Do not use SAMSCA for a condition for which it was not prescribed. Do not give SAMSCA to other people, even if they have the same symptoms you have. It may harm them.

This Medication Guide summarizes the most important information about SAMSCA. If you would like more information, talk with your healthcare provider. You can ask your healthcare provider or pharmacist for information about SAMSCA that is written for healthcare professionals. For more information about SAMSCA, call 1-877-726-7220 or go to www.samsca.com.

What are the ingredients in SAMSCA?

Active ingredient: tolvaptan.

Inactive ingredients: corn starch, hydroxypropyl cellulose, lactose monohydrate, low-substituted hydroxypropyl cellulose, magnesium stearate and microcrystalline cellulose, and FD&C Blue No. 2 Aluminum Lake as colorant.

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