

PRODUCT INFORMATION

FOSRENOL®

500 mg and 1000 mg chewable tablets

NAME OF DRUG

Lanthanum carbonate hydrate

$\text{La}_2(\text{CO}_3)_3 \cdot x\text{H}_2\text{O}$ = 457.85 (anhydrous), on average $x = 4.5$ moles of water.

CAS Registry Number: 54451-24-0

DESCRIPTION

FOSRENOL (lanthanum carbonate hydrate) has been developed as a dietary phosphate-binding agent. Phosphate absorption from the gastrointestinal tract is effectively decreased by the formation of highly insoluble complexes that are largely unable to pass through the wall of the gastrointestinal tract and are eliminated by excretion.

FOSRENOL is presented as chewable tablets. Each tablet contains lanthanum carbonate hydrate corresponding to 500 mg or 1000 mg lanthanum. The tablets also contain the excipients dextrates (hydrated), colloidal anhydrous silica and magnesium stearate.

PHARMACOLOGY

Pharmacodynamic Properties

FOSRENOL is indicated for the treatment of hyperphosphataemia. FOSRENOL contains lanthanum carbonate hydrate. The activity of lanthanum carbonate as a phosphate binder is dependent on the high affinity of lanthanum ions, which are released from the carbonate salt in the acid environment of the upper gastrointestinal tract, for dietary phosphate. Insoluble lanthanum phosphate is formed which reduces the absorption of phosphate from the gastrointestinal tract.

Several studies have shown that lanthanum can be used to control hyperphosphataemia associated with chronic renal failure through dose titration and that effect is maintained with long-term use. A lower incidence of hypercalcaemia was reported with FOSRENOL (0.4%) compared with calcium-based binders (20.2%) in comparative studies.

Serum PTH concentrations may fluctuate depending on a patient's serum calcium, phosphate and vitamin D status. FOSRENOL has not been shown to have any direct effects on PTH secretion.

Pharmacokinetic Properties

As binding between lanthanum and dietary phosphorus occurs in the lumen of the stomach and upper small intestine, the therapeutic effectiveness of FOSRENOL is not dependent on levels of lanthanum in the plasma.

Lanthanum is present in the environment. Measurement of background levels in non-lanthanum treated chronic renal failure patients during Phase III clinical trials revealed concentrations of <0.05 to 0.90 ng/mL in plasma, and <0.006 to 1.02 µg/g in bone biopsy samples.

Absorption

Lanthanum carbonate has low aqueous solubility (<0.01 mg/mL at pH 7.5) and is minimally absorbed following oral administration. Absolute oral bioavailability is estimated to be <0.002% in humans.

In healthy subjects, plasma AUC and C_{max} increased as a function of dose, but in a less than proportional manner, after single oral doses of 250 to 1000 mg lanthanum, consistent with dissolution-limited absorption. The apparent plasma elimination half-life in healthy subjects was 36 hours.

In renal dialysis patients dosed for 10 days with 1000 mg lanthanum 3 times daily, the mean (\pm sd) peak plasma concentration was 1.06 (\pm 1.04) ng/mL, and mean AUC_{last} was 31.1 (\pm 40.5) ng.h/mL. Regular blood level monitoring in 1707 renal dialysis patients taking lanthanum carbonate for up to 2 years showed no increase in plasma lanthanum concentrations over this time period.

Distribution

Orally administered lanthanum is distributed predominantly within the gastrointestinal tract. The small fraction absorbed is extensively bound to human plasma proteins (>99.7%), and binding is high capacity and non-specific. In long-term animal studies, at oral doses up to 17 times a human dose of 3000 mg/day, lanthanum concentrations in the majority of tissues were less than 1 μ g/g. Concentrations in brain and cerebrospinal fluid (CSF) were below or around the assay quantification limit (0.01 μ g/g for brain and 0.05 ng/mL for CSF) and median steady state concentrations were up to 8.2 μ g/g in bone, 11.1 μ g/g in liver and 2.2 mg/g in the stomach wall. Rodents, but not dogs, treated at doses 4 times the human dose of 3000 mg/day showed submucosal inflammation and epithelial hyperplasia of the stomach. No other adverse effects were associated with these concentrations. Lanthanum levels in these tissues dissipated very slowly after the cessation of oral dosing, with a half-life >26 weeks.

Metabolism

Lanthanum is not metabolised. Studies in chronic renal failure patients with hepatic impairment have not been conducted. In patients with co-existing hepatic disorders at the time of entry into Phase III clinical studies, there was no evidence of increased plasma exposure to lanthanum or worsening hepatic function after treatment with FOSRENOL for periods up to 2 years.

Elimination

Lanthanum is excreted mainly in the faeces (>90%) with only around 0.000031% of an oral dose excreted via the urine in healthy subjects.

CLINICAL TRIALS

A total of 1130 patients with chronic renal failure treated with maintenance haemodialysis or CAPD were studied in two phase II and two phase III studies (LAM-IV-202, 204, 301 and 302). Three studies were placebo controlled (1 fixed dose and 2 titrated dose designs) and one included calcium carbonate as an active comparator. During these studies, 1016 patients received lanthanum carbonate, 267 received calcium carbonate and 95 received placebo.

The first phase III study (301) was a two-part study designed to assess the reduction of serum phosphate by FOSRENOL compared to calcium carbonate. The study had 2 parts: Part 1 was a 5-week titration phase after randomization to FOSRENOL or calcium carbonate where patients were titrated to a target phosphate level of 1.8 mmol/L. Part 2 was a 20-week maintenance phase where patients maintained their doses of binder and plasma phosphate levels assessed. The study endpoints were % patients achieving target phosphate levels at the end of the titration and maintenance periods. The plasma phosphate levels from this study are presented in Table 1. Serum phosphate levels were reduced to target levels of 1.8 mmol/L at the end of the 5 week titration period, in 58% of the lanthanum group compared with 70% of the calcium carbonate group. Following 25 weeks of treatment, the proportions controlled were 66% (lanthanum carbonate) and 64% (calcium carbonate).

Table 1: Plasma phosphate (mmol/L) levels in clinical study 301.

		Treatment Group	
Weeks on treatment	Visit	Lanthanum	Calcium

		N	Mean (SD)	N	Mean (SD)
0	1	504	2.67 (0.66)	254	2.69 (0.63)
5 (Endpoint 1) ¹	6	453	1.87 (0.52)	209	1.66 (0.48)
25 (Endpoint 2) ²	11	222	1.73 (0.46)	122	1.72 (0.48)

¹ Primary endpoint, after completion of titration phase

² Secondary endpoint, after completion of maintenance phase

The second Phase III study (302) was a double-blind, placebo controlled study designed to assess the maintenance in reduction in serum phosphate levels after an open-label titration phase with FOSRENOL to achieve a target phosphate concentration of 1.8 mmol/L. This was followed by a 4-week double-blind phase where patients were randomised to continue to receive FOSRENOL or a comparable number of placebo tablets. The endpoint of this study was the plasma phosphate concentrations after 4 weeks of treatment on FOSRENOL or placebo. A total of 93 patients completed the open-label phase and were randomised to FOSRENOL or placebo. The plasma phosphate levels at the end of the open-label titration and at each week of the double-blind study are presented in Table 2.

Table 2: Plasma phosphate levels (mmol/L) in clinical study 302.

	Treatment Group			
	Lanthanum		Placebo	
	N	Mean (SD)	N	Mean (SD)
End of Titration ¹	46	1.81 (0.54)	43	1.77 (0.48)
RMP Week 1	46	1.87 (0.54)	43	2.23 (0.54)
RMP Week 2	44	1.86 (0.48)	43	2.41 (0.55)
RMP Week 3	41	1.78 (0.45)	39	2.46 (0.65)
RMP Week 4	41	1.89 (0.50)	38	2.49 (0.61)
Study Endpoint²	44	1.91 (0.53)	43	2.54 (0.63)

¹ End of open-label titration phase (Randomisation)

² Study endpoint (LOCF) double-blind, placebo phase.

RMP = Randomised Maintenance Phase

Hyperphosphataemia

Lanthanum has been demonstrated to be an effective binder of dietary phosphate for use in controlling the hyperphosphataemia of chronic renal failure. Multiple studies have shown that lanthanum can reliably be used to achieve serum phosphate reductions to target levels through dose titration and to effectively maintain control of serum phosphate levels with long-term use. Maintenance of target phosphate levels was shown to be similar between lanthanum and calcium treatments.

The lowest effective dose of lanthanum that is effective in the control of serum phosphate levels was established to be approximately 750 mg/day. Doses of up to 3000 mg lanthanum resulted in a reduction of serum phosphate to within target control levels in most patients.

No difference in level of control was observed between those patients on haemodialysis and those receiving CAPD. In addition no difference in the effectiveness of lanthanum carbonate administration was noted between patients under or over 65 years of age.

Effects on Bone

Overall, FOSRENOL and standard treatments, including calcium carbonate, produced similar effects on the bones of dialysis patients.

Results from histology and histomorphometry of human biopsy samples evaluated to date from the three clinical studies (Study 301 where patients had been treated with lanthanum carbonate for up to 4.5 years, Studies 303 and 307) showed no evidence of osteomalacia or other adverse bone pathology. In Study 303, a randomised study to investigate the effect of FOSRENOL with calcium carbonate, results showed that FOSRENOL produced marginally greater improvements

towards normal values than calcium carbonate for many of the bone primary and secondary response variables in addition to the general improvements in bone growth and turnover parameters. In Study 307, a study where patients had been treated for 2 years, no statistical differences in bone parameters between patients randomised to receive standard therapy or FOSRENOL were observed. Analysis of data from paired bone biopsies (at baseline and at one or two years) in patients randomised to either FOSRENOL or calcium carbonate in Study 303 and patients randomised to either FOSRENOL or alternative therapy in Study 307, showed no differences in the development of mineralisation defects between the groups. An analysis of adverse events in the bone study participants in these studies did not show any increase in adverse events related to the musculoskeletal system, including fractures. FOSRENOL, therefore, does not appear to harm bone following treatment for up to 4.5 years.

INDICATIONS

Treatment of hyperphosphataemia in adults with chronic renal failure on haemodialysis or continuous ambulatory peritoneal dialysis (CAPD).

CONTRAINDICATIONS

Hypersensitivity to lanthanum or any of the excipients in the product.

Hypophosphataemia.

FOSRENOL is contraindicated in patients with bowel obstruction, ileus and faecal impaction.

PRECAUTIONS

Tissue deposition of lanthanum, particularly in bone, liver and the stomach wall, has been shown with FOSRENOL in animal studies. Deposition of lanthanum in bone has been studied (see Effects on Bone). Results from long-term studies (Studies 301, 303 and 307) demonstrated that bone lanthanum concentration had no apparent effect on bone health or treatment outcome for up to 4.5 years. There is no clinical data examining the potential deposition of lanthanum in other tissues. The use of FOSRENOL in clinical studies beyond 2 years is currently limited. However, treatment of subjects with FOSRENOL for up to 6 years has not demonstrated a change in the benefit/risk profile.

The efficacy and safety of FOSRENOL has not been studied in children.

Patients with renal insufficiency may develop hypocalcaemia. FOSRENOL does not contain calcium. Serum calcium levels should therefore be monitored at the usual time intervals for this patient population and appropriate supplements should be given.

Lanthanum is not metabolised by liver enzymes but it is most likely excreted in the bile. Conditions resulting in a marked reduction of bile flow may be associated with incrementally slower elimination of lanthanum, which may result in higher plasma levels and increased tissue deposition of lanthanum (see PHARMACOLOGY, Pharmacokinetic Properties). As the liver is the principal organ of elimination of absorbed lanthanum monitoring of liver function tests is recommended.

There have been cases of gastrointestinal obstruction, ileus, subileus, and gastrointestinal perforation reported in association with lanthanum, some requiring surgery or hospitalization. Some of the cases are found to have lanthanum deposition. Lanthanum deposition in gastroduodenal mucosa is demonstrated endoscopically as whitish lesions of different sizes and shapes. Also, various pathological features were identified in gastroduodenal mucosa with lanthanum deposition, such as chronic or active inflammation, glandular atrophy, regenerative changes, foveolar hyperplasia, intestinal metaplasia and neoplasia. Exercise caution in all patients predisposed to gastrointestinal obstruction, ileus, subileus and perforation; for example those with altered gastrointestinal anatomy (e.g. diverticular disease, peritonitis, history of gastrointestinal surgery, gastrointestinal cancer and gastrointestinal ulceration), hypomotility disorders (e.g., constipation, diabetic gastroparesis) and when used with medications known to

potentiate these effects. Some cases were reported in patients with no history of gastrointestinal disease.

During treatment with lanthanum carbonate, physicians and patients should remain vigilant for signs and symptoms of gastrointestinal disorders, especially constipation and abdominal pain/distention which may indicate bowel obstruction, ileus or subileus.

Treatment with lanthanum carbonate should be re-evaluated in patients who develop severe constipation or other severe gastrointestinal signs and symptoms.

Patients with acute peptic ulcer, ulcerative colitis, Crohn's disease or bowel obstruction were not included in clinical studies with FOSRENOL.

FOSRENOL tablets must be chewed completely and not swallowed whole. Serious gastrointestinal complications have been reported in association with unchewed or incompletely chewed tablets [see DOSAGE AND ADMINISTRATION].

Abdominal x-rays of patients taking lanthanum carbonate may have a radio-opaque appearance typical of an imaging agent.

Effects on Fertility

There are no human data on the effects of lanthanum carbonate on fertility. Lanthanum carbonate administered to female and male rats prior to and throughout mating at oral doses up to 2000 mg/kg/day (half the clinical exposure based on AUC at 3000 mg/day) did not alter mating or fertility.

Use in Pregnancy

Pregnancy Category B3

There was no evidence of teratogenicity in rats or rabbits following oral administration of lanthanum carbonate during the period of organogenesis at doses up to 2000 (rat) and 1500 (rabbit) mg/kg/day (0.5-1.2 times the clinical exposure based on AUC at 3000 mg/day). Increased implantation loss, and delayed skeletal ossification occurred in rabbits at ≥ 1500 mg/kg/day, in association with maternal toxicity. There are no adequate data from the use of FOSRENOL in pregnant women. The safety of lanthanum carbonate in human pregnancy has not been established. FOSRENOL should not be used during pregnancy unless the potential benefit justifies the potential risk.

Use in Lactation

There is some evidence that lanthanum can be excreted in human breast milk. The excretion of lanthanum in milk following oral treatment with lanthanum carbonate has not been studied in animals. Post-natal development was delayed in the offspring of rats receiving oral doses of lanthanum carbonate at 2000 mg/kg/day. Women taking FOSRENOL should stop breastfeeding.

Carcinogenicity

Lanthanum carbonate, at doses 13-times higher than the clinical dose of 3000 mg/day, caused a slight increase in gastric adenomas in mice. This response was considered to be an exacerbation of spontaneous stomach pathology and secondary to changes in the gastric environment caused by lanthanum carbonate administration. Gastric pathology was confined to rodents.

Genotoxicity

In vitro assays for gene mutations (bacteria and CHO cells) and *in vivo* studies for chromosomal or DNA damage did not provide evidence of genotoxic potential. An *in vitro* chromosome aberration assay in CHO cells had an equivocal outcome.

Interactions with other Medicines

Lanthanum carbonate may increase gastrointestinal pH. It is recommended that compounds, which are known to interact with antacids, should not be taken within 2 hours of dosing with FOSRENOL (e.g. chloroquine, hydroxychloroquine and ketoconazole).

In healthy subjects, the absorption and pharmacokinetics of lanthanum were not affected by co-administration of citrate.

Serum levels of fat-soluble vitamins A, D, E and K, were not affected by FOSRENOL administration in clinical studies.

Human volunteer studies have shown that co-administration of FOSRENOL with digoxin, warfarin or metoprolol does not produce clinically-relevant changes in the pharmacokinetic profiles of these drugs. Potential pharmacodynamic interactions between lanthanum and these drugs (e.g. bleeding time or prothrombin time) were not evaluated. None of the drug interaction studies were done at the maximum recommended therapeutic dose of lanthanum carbonate. No drug interaction studies assessed the effects of drugs on phosphate binding by lanthanum carbonate.

In simulated gastric juice, lanthanum carbonate did not form insoluble complexes with warfarin, digoxin, frusemide, phenytoin, metoprolol or enalapril, suggesting a low potential to affect the absorption of these drugs.

Lanthanum carbonate is not a substrate for cytochrome P450. *In vitro* tests indicate that no significant inhibition of the activities of the major human cytochrome P450 isoenzymes, CYP1A2, CYP2D6, CYP3A4, CYP2C9 or CYP2C19 is expected at therapeutic concentrations. Lanthanum is extensively bound in human plasma and isolated human plasma protein preparations, including albumin, transferrin and alpha-1-acid glycoprotein (99.7 to >99.9%).

No evidence of compleximetric interactions has been observed with FOSRENOL. However, such interaction with drugs such as tetracycline, and doxycycline are theoretically possible and if these compounds are to be co-administered, it is recommended that they are not to be taken within 2 hours of dosing with FOSRENOL.

The bioavailability of oral ciprofloxacin was decreased by approximately 50% when taken with FOSRENOL in a single dose study in healthy volunteers. It is recommended that oral floxacin formulations are taken at least 2 hours before or 4 hours after FOSRENOL.

Phosphate binders (including FOSRENOL) have been shown to reduce the absorption of levothyroxine. Consequently, thyroid hormone replacement therapy should not be taken within 2 hours of dosing with FOSRENOL and closer monitoring of TSH levels is recommended in patients receiving both medicinal products.

***In Vitro*- Interactions with other Medicines**

Gastric Fluid: The potential for a physico-chemical interaction (precipitation) between lanthanum and six commonly used medications (warfarin, digoxin, furosemide, phenytoin, metoprolol, and enalapril) was investigated in simulated gastric fluid. The results suggest that precipitation in the stomach of insoluble complexes of these drugs with lanthanum is unlikely.

The therapeutic activity of FOSRENOL depends on the acidity of the gastric environment. The potential for drugs which alter gastric acidity (for example proton-pump inhibitors) to alter the therapeutic activity of FOSRENOL has not been examined in trials but should be considered.

***In Vivo*- Interactions with other Medicines**

Lanthanum carbonate is neither a substrate nor an inhibitor of CYP450 enzymes.

The absorption of a single dose of 1000 mg of FOSRENOL is unaffected by co-administration of citrate. No effects of lanthanum were found on the absorption of digoxin (0.5 mg), metoprolol (100 mg), or warfarin (10 mg) in healthy subjects co-administered lanthanum carbonate (three doses of 1000 mg on the day prior to exposure and one dose of 1000 mg on the day of coadministration). Potential pharmacodynamic interactions between lanthanum and these drugs (e.g. bleeding time or prothrombin time) were not evaluated. None of the drug interaction studies was done with the maximum recommended therapeutic dose of lanthanum carbonate.

No drug interaction studies assessed the effects of drugs on phosphate binding by lanthanum carbonate.

Effects on Ability to Drive and use Machines

FOSRENOL may induce dizziness and nausea, which may impair the ability to drive and use machinery.

ADVERSE EFFECTS

The safety of FOSRENOL for use in patients with end-stage renal failure (ESRF) in both hemodialysis and peritoneal dialysis patients has been examined in three short-term, placebo-controlled, double-blind studies, three long-term, comparator-controlled studies, and three long-term open-label studies. These studies have provided a total safety database of 1754 patients treated with lanthanum carbonate hydrate and represents a mean exposure of 272.1 days (median 184.0 days, range 1-1123 days).

The most common adverse events ($\geq 5\%$ in either treatment group) in two long-term open-label phase III trials that included 1215 patients treated with lanthanum carbonate hydrate and 944 with alternative therapy are detailed in Table 3.

The adverse events in the long-term, open label, active controlled, study of FOSRENOL vs. alternative therapy (Study 307) have been adjusted for mean exposure differences between the treatment groups (with a mean exposure of 1.0 years on lanthanum and 1.4 years on alternative therapy). The adjustment for mean exposure was achieved by multiplying the observed adverse event rates in the alternative therapy group by 0.74.

Table 3. Incidence of Treatment-Emergent Adverse Events that occurred in $\geq 5\%$ of Patients (in Either Treatment Group) and in Both Comparative Studies 307 and 301.

	Study 307 %		Study 301 %	
	FOSRENOL (N=682)	Alternative Therapy* Adjusted Rates (N=677)	FOSRENOL (N=533)	Calcium Carbonate (N=267)
Nausea	37	29	16	13
Vomiting	27	22	18	11
Dialysis graft complication	25	24	3	5
Diarrhoea	24	24	13	10
Headache	22	21	5	6
Dialysis graft occlusion	21	21	4	6
Abdominal pain	17	18	5	3
Hypotension	16	18	8	9
Constipation	15	14	6	7
Bronchitis	5	7	5	6
Rhinitis	4	6	7	6
Hypercalcaemia	4	8	0	20

* alternative therapy included calcium carbonate, calcium acetate, sevelamer, aluminium based phosphate binders

Overall, approximately 24% of all ESRF patients who participated in these clinical studies reported a drug related adverse reaction, as determined by the investigator. No individual ADR was reported at a frequency greater than 10%.

The most commonly reported adverse drug reactions, with the exception of headache and allergic skin reactions, are gastrointestinal in nature; these are minimized by taking FOSRENOL with food and generally abated with time with continued dosing (see DOSAGE AND ADMINISTRATION).

The following convention was used for frequency of adverse drug reactions: Very common ($\geq 1/10$); Common ($\geq 1/100$ to $< 1/10$); Uncommon ($\geq 1/1,000$ to $< 1/100$); Rare ($\geq 1/10,000$ to $< 1/1,000$); Very rare ($< 1/10,000$), not known (cannot be estimated from the available data).

Infections and Infestations	
Uncommon	Gastroenteritis, laryngitis
Blood and lymphatic system disorders	
Uncommon	Eosinophilia
Endocrine disorders	
Uncommon	Hyperparathyroidism
Metabolism and nutrition disorders	
Common	Hypocalcaemia
Uncommon	Hypercalcaemia, hyperglycaemia, hyperphosphataemia, hypophosphataemia, anorexia, appetite increased
Not known	Decreased appetite
Nervous system disorders	
Very Common	Headache
Uncommon	Dizziness, taste alteration
Ear and Labyrinth disorders	
Uncommon	Vertigo
Gastrointestinal disorders	
Very Common	Abdominal pain, diarrhoea, nausea, vomiting
Common	Constipation, dyspepsia, flatulence
Uncommon	Ileus, subileus, intestinal obstruction, eructation, indigestion, irritable bowel syndrome, dry mouth, oesophagitis, stomatitis, loose stools, tooth disorder, gastro-intestinal disorder NOS*
Rare	Intestinal perforation
Skin and subcutaneous tissue disorders	
Uncommon	Alopecia, sweating increased
Musculoskeletal and connective tissue disorders	
Uncommon	Arthralgia, myalgia, osteoporosis
General disorders and administration site conditions	
Uncommon	Asthenia, chest pain, fatigue, malaise, peripheral oedema, pain, thirst
Investigations	
Uncommon	Blood aluminium increased, increase in GGT, increases in hepatic transaminases, alkaline phosphatase increased, weight decrease.
Not known	Lanthanum deposition in the gastrointestinal tract

* Not otherwise specified

Frequency, type and severity of adverse reactions in children have not been fully established. In particular, uncertainty exists on the accumulation in bone and risk of growth retardation with treatment in children

Post marketing experience: During post-approval use of FOSRENOL, cases of Allergic Skin Reactions (including skin rashes, urticaria and pruritus) have been reported which show a close temporal relationship to lanthanum carbonate therapy. In clinical trials, Allergic Skin Reactions were seen in both FOSRENOL and placebo/active comparator groups at a frequency of Very Common ($\geq 1/10$).

Although there have been a number of additional isolated reactions reported, none of these reactions are considered unexpected in this patient population.

Transient QT changes have been observed but these were not associated with any adverse events.

DOSAGE AND ADMINISTRATION

Patients should adhere to recommended diets in order to control phosphate and fluid intake. Tablets must be chewed completely and not swallowed whole. To aid with chewing the tablets may be crushed.

Adults, including elderly (>65 years)

For patients taking FOSRENOL for the first time, the starting dose may be determined individually based on serum phosphate concentration as indicated below:

Pre-treatment serum phosphate level	Recommended initial daily dose of FOSRENOL
>1.8 and ≤ 2.4 mmol/L	750 mg
>2.4 and ≤ 2.9 mmol/L	1500 mg
>2.9 mmol/L	2250 mg

FOSRENOL should be taken with or immediately after food, with the daily dose divided between meals, i.e. three times daily. Serum phosphate levels should be monitored and the dose of FOSRENOL titrated every 2-3 weeks until an acceptable serum phosphate level is reached, with regular monitoring thereafter.

Control of serum phosphate level has been demonstrated at doses from 750 mg with most patients achieving acceptable serum phosphate levels at 1500 – 3000 mg lanthanum per day.

Hepatic impairment

The effect of hepatic impairment on FOSRENOL pharmacokinetics has not been formally assessed. Due to its mechanism of action and the lack of liver metabolism, doses in hepatic impairment should not be modified, but patients should be monitored carefully (see PRECAUTIONS and PHARMACOLOGY, Pharmacokinetic Properties).

Children and Adolescents

The safety and efficacy of FOSRENOL has not been established in patients below the age of 18 years.

OVERDOSAGE

No case of overdose has been reported. The highest daily dose of lanthanum administered to healthy volunteers during Phase I studies was 4718 mg given for 3 days. The adverse events seen were mild to moderate and included nausea and headache.

PRESENTATION

FOSRENOL is supplied as chewable tablets in white cylindrical HDPE bottles fitted with polypropylene caps and is available in the following presentation and pack sizes:

FOSRENOL 500 mg: White to off-white round, flat beveled edge tablets debossed on one side with 'S405' above '500'; 45 tablets per bottle; 2 bottles per pack (pack of 90 tablets).

FOSRENOL 1000 mg: White to off-white round, flat beveled edge tablets debossed on one side with 'S405' above '1000'; 15 tablets per bottle; 6 bottles per pack (pack of 90 tablets).

Not all presentations are available locally.

STORAGE CONDITIONS

Store below 25°C.

Product owner: Takeda Pharmaceuticals International AG Ireland Branch, Dublin, Ireland

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