

Summary of Product Characteristics for Pharmaceutical Products

1. Name of the medicinal product:

TOBRASONE Eye Ointment.

2. Qualitative and quantitative composition

Each 1 g of ointment contains

Tobramycin sulphate

Eq. to Tobramycin..... 3 mg

Dexamethasone..... 1 mg

For a full list of excipients, see section 6.1.

3. Pharmaceutical form

Eye ointment.

White to off-white ointment.

4. Clinical particulars

4.1 Therapeutic indications

Tobrasone Eye is indicated for steroid-responsive inflammatory ocular conditions for which a corticosteroid is indicated and where superficial bacterial ocular infection or a risk of bacterial ocular infection exists.

Ocular steroids are indicated in inflammatory conditions of the palpebral and bulbar conjunctiva, cornea and anterior segment of the globe where the inherent risk of steroid use in certain infective conjunctivitides is accepted to obtain a diminution in edema and inflammation. They are also indicated in chronic anterior uveitis and corneal injury from chemical, radiation or thermal burns, or penetration of foreign bodies

The use of a combination drug with an anti-infective component is indicated where the risk of superficial ocular infection is high or where there is an expectation that potentially dangerous numbers of bacteria will be present in the eye.

4.2 Posology and method of administration

To apply the ointment: Tilt your head back slightly and pull down your lower eyelid to create a small pocket. Squeeze a ribbon of ointment from the tube into this pocket. Blink your eye gently and then keep it closed for 1 or 2 minutes. Wipe excess ointment from your eyelashes using a clean tissue.

Do not touch the tip of the ointment tube or place it directly on your eye. A contaminated tip can infect your eye, which could lead to serious vision problems.

If you use this medicine for longer than 10 days, you may need frequent vision tests to check the pressure inside your eyes.

In case of concomitant therapy with other topical ocular medicinal products, an interval of 5 minutes should be allowed between successive applications. Eye ointments should be administered last.

4.3 Contraindications

- Hypersensitivity to the active substances or to any of the excipients.
- Herpes simplex keratitis.
- Vaccinia, varicella, and other viral infection of cornea or conjunctiva.
- Fungal diseases of ocular structures or untreated parasitic eye infections.
- Mycobacterial ocular infections.

4.4 Special warnings and precautions for use

Gently closing the eyelid and nasolacrimal occlusion after instillation is recommended. This may reduce the systemic absorption of medicinal products administered via the ocular route and result in a decrease in systemic side effects.

Sensitivity to topically administered aminoglycosides may occur in some patients. Severity of hypersensitivity reactions may vary from local effects to generalized reactions such as erythema, itching, urticarial, skin rash, anaphylaxis, anaphylactoid reactions, or bullous reactions. If hypersensitivity develops during use of this medicine, treatment should be discontinued.

Cross-hypersensitivity to other aminoglycosides can occur, and the possibility that patients who become sensitized to topical tobramycin may also be sensitive to other topical and/or systemic aminoglycosides should be considered.

Serious adverse reactions including neurotoxicity, ototoxicity and nephrotoxicity have occurred in patients receiving systemic aminoglycoside therapy. Caution is advised when Tobrasone Eye Ointment are used concomitantly with systemic aminoglycosides.

Caution should be exercised when prescribing Tobradex Eye Drops/Eye Ointment to patients with known or suspected neuromuscular disorders such as myasthenia gravis or Parkinson's disease. Aminoglycosides may aggravate muscle weakness because of their potential effect on neuromuscular function.

Prolonged use of topical ophthalmic corticosteroids may result in ocular hypertension and/or glaucoma, with damage to the optic nerve, reduced visual acuity and visual field defects, and posterior subcapsular cataract formation. In patients receiving prolonged ophthalmic corticosteroid therapy, intraocular pressure should be checked routinely and frequently. This is especially important in

pediatric patients, as the risk of corticosteroid-induced ocular hypertension may be greater in children and may occur earlier than in adults. The risk of corticosteroid-induced raised intraocular pressure and/or cataract formation is increased in predisposed patients (e.g. diabetes).

Cushing's syndrome and/or adrenal suppression associated with systemic absorption of ophthalmic dexamethasone may occur after intensive or long-term continuous therapy in predisposed patients, including children and patients treated with CYP3A4 inhibitors (including ritonavir and cobicistat). In these cases, treatment should not be discontinued abruptly, but progressively tapered.

Corticosteroids may reduce resistance to and aid in the establishment of bacterial, viral or fungal or parasitic infections and mask the clinical signs of infection.

Fungal infection should be suspected in patients with persistent corneal ulceration. If fungal infection occurs, corticosteroids therapy should be discontinued.

Prolonged use of antibiotics such as tobramycin may result in overgrowth of non-susceptible organisms, including fungi. If superinfection occurs, appropriate therapy should be initiated.

Topical ophthalmic corticosteroids may slow corneal wound healing. Topical NSAIDs are also known to slow or delay healing. Concomitant use of topical NSAIDs and topical steroids may increase the potential for healing problems.

In those diseases causing thinning of the cornea or sclera, perforations have been known to occur with the use of topical corticosteroids.

4.5 Interaction with other medicinal products and other forms of interaction

Concomitant use of topical steroids and topical NSAIDs may increase the potential for corneal healing problems.

CYP3A4 inhibitors including ritonavir and cobicistat may increase systemic exposure resulting in increased risk of adrenal suppression/Cushing's syndrome. (See Section 4.4). The combination should be avoided unless the benefit outweighs the increased risk of systemic corticosteroid side-effects, in which case patients should be monitored for systemic corticosteroid effects.

4.6 Fertility, pregnancy, and lactation

Fertility

Studies have not been conducted to evaluate the effect of tobramycin on human or animal fertility. There is limited clinical data to evaluate the effect of dexamethasone on male or female fertility. Dexamethasone was free of adverse effects on fertility in a chorionic gonadotropin primed rat model.

Pregnancy

There are no or limited amount of data from the topical ocular use of tobramycin and dexamethasone in pregnant women. Tobramycin does cross the placenta into the fetus after intravenous dosing in pregnant women. Tobramycin is not expected to cause ototoxicity from in utero exposure. Prolonged or repeated corticoid use during pregnancy has been associated with an increased risk of intra-uterine growth retardation. Infants born of mothers who have received substantial doses of corticosteroids during pregnancy should be observed carefully for signs of hypoadrenalism.

Studies in animals have shown reproductive toxicity after systemic administration of tobramycin and dexamethasone. These effects were observed at exposures considered sufficiently in excess of the maximum human ocular dosage delivered from the maternal use of the product. Tobramycin has not been shown to induce teratogenicity in rats or rabbits. The ocular administration of 0.1% dexamethasone resulted in fetal anomalies in rabbits.

Tobrasone eye ointment is not recommended during pregnancy

Lactation

Tobramycin is excreted in human milk after systemic administration. No data is available on the passage of dexamethasone into human breast milk. It is unknown whether tobramycin and dexamethasone are excreted in human milk following topical ocular administration. It is not likely that the amount of Tobramycin and Dexamethasone would be detectable in human milk or be capable of producing clinical effects in the infant following topical use of the product.

A risk to the breastfed child cannot be excluded. A decision must be made whether to discontinue breast-feeding or to discontinue/abstain from therapy taking into account the benefit of breast-feeding for the child and the benefit of therapy for the woman.

4.7 Effects on ability to drive and use machines.

Temporary blurred vision or other visual disturbances may affect the ability to drive or use machines. If blurred vision occurs after instillation, the patient must wait until the vision clears before driving or using machinery

4.8 Undesirable effects

The following adverse reactions have been reported during clinical trials with Tobrasone Eye Ointment and are classified according to the

subsequent convention: 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 $<1/1,000$) and very rare ($<1/10,000$). Within each frequency-grouping, adverse reactions are presented in order of decreasing seriousness.

System organ classification	Adverse reactions
Eye disorders	<i>Uncommon:</i> intraocular pressure increased, eye pain, eye pruritus, ocular discomfort, eye irritation <i>Rare:</i> keratitis, eye allergy, vision blurred, dry eye, ocular hyperaemia
Gastrointestinal disorders	<i>Rare:</i> dysgeusia

Additional adverse reactions identified from post-marketing surveillance of the innovator brand include the following. Frequencies cannot be estimated from the available data.

System organ classification	Adverse reactions
Immune system disorders	anaphylactic reaction, hypersensitivity
Nervous system disorders	dizziness, headache
Eye disorders	eyelid oedema, erythema of eyelid, mydriasis, lacrimation increased
Gastrointestinal disorders	nausea, abdominal discomfort
Skin and subcutaneous tissue disorders	erythema multiforme, rash, swelling face, pruritus

4.9 Overdose

Due to the characteristics of this preparation, no toxic effects are to be expected with an ocular overdose of this product, or in the event of accidental ingestion of the contents of one bottle or tube

5. Pharmacological properties

5.1 Pharmacodynamic properties

Pharmacotherapeutic group: anti-inflammatory agents and antiinfectives in combination; corticosteroids and antiinfectives in combination.

ATC code: S01CA01.

Mechanism of action

Topical corticosteroids exert an anti-inflammatory action and have been used for the treatment for anterior inflammation since the 1950s. Aspects of the inflammatory process such as edema, fibrin deposition, capillary dilation, leukocyte migration, capillary proliferation, deposition of collagen, scar formation, and fibroblastic proliferation are suppressed. Topical corticosteroids are effective in acute inflammatory conditions of the conjunctiva, sclera, cornea, lids, iris, and anterior segment of the globe as well as in ocular allergic conditions.

Dexamethasone is one of the most potent corticosteroids; it is 5 to 14 times more potent than prednisolone and 25 to 75 times more potent than cortisone and hydrocortisone. Of paramount importance with regard to local therapy is the fact that dexamethasone is over 2,000 times more soluble than hydrocortisone or prednisolone. The exact

mechanism of anti-inflammatory action of dexamethasone is unknown. It inhibits multiple inflammatory cytokines and produces multiple glucocorticoid and mineralocorticoid effects.

Dexamethasone is a potent corticoid. Corticoids suppress the inflammatory response to a variety of agents and they can delay or slow healing. Since corticoids may inhibit the body's defense mechanism against infection, a concomitant antimicrobial drug may be used when this inhibition is considered to be clinically significant. Tobramycin is an antibacterial drug. It inhibits the growth of bacteria by inhibiting protein synthesis.

Mechanism of resistance

Resistance to tobramycin occurs by several different mechanisms including (1) alterations of the ribosomal subunit within the bacterial cell; (2) interference with the transport of tobramycin into the cell, and (3) inactivation of tobramycin by an array of adenylating, phosphorylating, and acetylating enzymes. Genetic information for production of inactivating enzymes may be carried on the bacterial chromosome or on plasmids. Cross resistance to other aminoglycosides may occur.

Breakpoints

The breakpoints and the in vitro spectrum as mentioned below are based on systemic use. These breakpoints might not be applicable on topical ocular use of the medicinal product as higher concentrations are obtained locally and the local physical/chemical circumstances can influence the activity of the product on the site of administration. In accordance with EUCAST, the following breakpoints are defined for tobramycin:

- Enterobacteriaceae S \leq 2 mg/L, R $>$ 4 mg/L
- Pseudomonas spp. S \leq 4 mg/L, R $>$ 4 mg/L
- Acinetobacter spp. S \leq 4 mg/L, R $>$ 4 mg/L
- Staphylococcus spp. S \leq 1 mg/L, R $>$ 1 mg/L
- Not species-related S \leq 2 mg/L, R $>$ 4 mg/L

Clinical efficacy against specific pathogens

The information listed below gives only an approximate guidance on probabilities whether microorganisms will be susceptible to tobramycin in Tobradex. Bacterial species that have been recovered from external ocular infections of the eye such as observed in conjunctivitis are presented here.

The prevalence of acquired resistance may vary geographically and with time for selected species and local information on resistance is desirable, particularly when treating severe infections. As necessary, expert advice should be sought when the local prevalence of resistance is such that the utility of tobramycin in at least some types of infections is questionable.

COMMONLY SUSCEPTIBLE SPECIES

- Aerobic Gram-positive microorganisms:
- Bacillus megaterium
- Bacillus pumilus
- Corynebacterium macginleyi

- *Corynebacterium pseudodiphtheriticum*
- *Kocuria kristinae*
- *Staphylococcus aureus* (methicillin susceptible – MSSA)
- *Staphylococcus epidermidis* (coagulase-positive and –negative)
- *Staphylococcus haemolyticus* (methicillin susceptible – MSSH)
- Streptococci (including some of the group A beta-hemolytic species, some nonhemo-lytic species, and some *Streptococcus pneumoniae*)

Aerobic Gram-negative microorganisms :

- *Acinetobacter calcoaceticus*
- *Acinetobacter junii*
- *Acinetobacter ursingii*
- *Citrobacter koseri*
- *Enterobacter aerogenes*
- *Escherichia coli*
- *H. aegyptius*
- *Haemophilus influenzae*
- *Klebsiella oxytoca*
- *Klebsiella pneumoniae*
- *Morganella morganii*
- *Moraxella catarrhalis*
- *Moraxella lacunata*
- *Moraxella osloensis*
- Some *Neisseria* species
- *Proteus mirabilis*
- Most *Proteus vulgaris* strains
- *Pseudomonas aeruginosa*
- *Serratia liquifaciens*

Anti-bacterial activity against other relevant pathogens

SPECIES FOR WHICH ACQUIRED RESISTANCE MIGHT BE A PROBLEM

- *Acinetobacter baumannii*
- *Bacillus cereus*
- *Bacillus thuringiensis*
- *Kocuria rhizophila*
- *Staphylococcus aureus* (methicillin resistant – MRSA)
- *Staphylococcus haemolyticus* (methicillin resistant –MRSH)
- *Staphylococcus*, other coagulase-negative spp.
- *Serratia marcescens*

INHERENTLY RESISTANT ORGANISMS

Aerobic Gram-positive microorganisms

- *Enterococcus faecalis*
- *Streptococcus mitis*
- *Streptococcus pneumoniae*
- *Streptococcus sanguis*
- *Chryseobacterium indologenes*

Aerobic Gram-negative microorganisms

- Haemophilus influenzae
- Stenotrophomonas maltophilia

Anaerobic Bacteria

- Propionibacterium acnes

Bacterial susceptibility studies demonstrate that in some cases, microorganisms resistant to gentamicin retain susceptibility to tobramycin.

PK/PD relationship

A specific PK/PD relationship has not been established for Tobradex.

Dexamethasone has

demonstrated dose-independent pharmacokinetics in published animal studies.

Published *in vitro* and *in vivo* studies have shown that tobramycin features a prolonged post-antibiotic effect, which effectively suppresses bacterial growth despite low serum concentrations. Systemic administration studies of tobramycin have reported higher maximum concentrations with once daily compared to multiple daily dosing regimens. However, the weight of current evidence suggests that once daily systemic dosing is equally as efficacious as multiple-daily dosing. Tobramycin exhibits a concentration-dependent antimicrobial kill and greater efficacy with increasing levels of antibiotic above the MIC or minimum bactericidal concentration (MBC).

Pediatric patients

The safety and efficacy of Tobradex in children have been established by broad clinical experience, but only limited data are available.

Geriatric patients

No overall clinical differences in safety or efficacy have been observed between the elderly and other adult populations.

5.2 Pharmacokinetic properties

Absorption

Tobramycin is poorly absorbed across the cornea and conjunctiva when administered by topical ocular route. A peak concentration of 3 micrograms/mL in aqueous humor after 2 hours was attained followed by a rapid decline after topical administration of 0.3% tobramycin. However, Tobradex delivers 542 ± 425 micrograms/mL tobramycin in human tears at 2 minutes after ocular dosing, a concentration that generally exceeds the MIC of the most resistant isolates (MICs >64 micrograms/mL).

Peak dexamethasone concentrations in aqueous humor after administration of Tobradex were attained approximately at 2 hours with a mean value 32 ng/mL.

Systemic absorption of tobramycin after Tobradex administration was poor with plasma concentrations generally below the limit of quantitation.

Plasma concentrations of dexamethasone was observed but were very low with all values less than 1 ng/mL after Tobradex administration.

The bioavailability of oral dexamethasone ranged from 70 to 80% in normal subjects and patients.

Distribution

For tobramycin, systemic volume of distribution is 0.26 L/kg in man. Human plasma protein binding of tobramycin is low at less than 10%.

For dexamethasone, the volume of distribution at steady state was 0.58 L/kg after intravenous administration. The plasma protein binding of dexamethasone is 77%.

Biotransformation

Tobramycin is not metabolized while dexamethasone is principally metabolized to 6beta- hydroxydexamethasone along with the minor metabolite, 6beta-hydroxy-20-dihydrodexamethasone.

Elimination

Tobramycin is excreted rapidly and extensively in the urine via glomerular filtration, and primarily as unchanged drug. Systemic tobramycin clearance was 1.43 ± 0.34 mL/min/kg for normal weight patients after intravenous administration and its systemic clearance decreased proportionally to renal function. The half-life for tobramycin is approximately 2 hours.

With dexamethasone after intravenous administration, the systemic clearance was 0.125 L/hr/kg with 2.6% of the dose recovered as unchanged parent drug while 70% of the dose was recovered as metabolites. The half-life has been reported as 3 to 4 hours but was found to be slightly longer in males. This observed difference was not attributed to changes in dexamethasone systemic clearance but to differences in volume of distribution and body weight.

Linearity/non-linearity

Ocular or systemic exposure with increasing dosing concentrations of tobramycin after topical ocular administration of tobramycin has not been tested. Therefore, the linearity of exposure with topical ocular dose could not be established. Mean C_{max} for dexamethasone at a topical ocular dose concentration of 0.033% with 0.3% tobramycin appeared lower than with Tobradex with a value of approximately 25 ng/mL but this decrease was not proportional to dose.

Hepatic and renal impaired

The pharmacokinetics of tobramycin or dexamethasone with Tobradex administration has not been studied in these patient populations.

Effect of age on pharmacokinetics

There is no change in tobramycin pharmacokinetics in older patients when compared to younger adults. No correlation between age and plasma concentrations of dexamethasone was observed after oral administration of dexamethasone as well.

Pediatric patients

Aminoglycosides including topical ocular tobramycin has been commonly used among children, infants and neonates to treat serious Gram-negative infections. Clinical pharmacology of tobramycin in children has been described after systemic administration. Dexamethasone pharmacokinetics in pediatrics appears not to differ from adults after intravenous dosing.

5.3 Preclinical safety data

Non-clinical data revealed no special hazard for humans from topical ocular exposure to tobramycin or dexamethasone based on conventional repeated-dose topical ocular toxicity studies, genotoxicity or carcinogenicity studies. Effects in non-clinical reproductive and developmental studies with tobramycin and dexamethasone were observed only at exposures considered sufficiently in excess of the maximum human ocular dosage indicating little relevance to clinical use for low-dose short- term courses of therapy

6. Pharmaceutical particulars

6.1 List of excipients

Glycerin USP
Liquid paraffin BP
Propylene Glycol BP

6.2 Incompatibilities

Not applicable.

6.3 Shelf life

24 months.

6.4 Special precautions for storage:

Store below 30°C
Keep in a cool dry place. Do not refrigerate.

6.5 Nature and contents of container

5 gm Aluminum collapsible liquor coating tube sealed with HDPE screw cap with the pack insert is packed in Primary Carton.

6.6 Special precautions for disposal and other handling:

No special requirements.

7. Marketing authorization holder and manufacturing site addresses

Marketing authorization holder:

Galaxy Pharmaceutical Ltd.
Doctor's Park, 3rd Parklands Avenue,
P.O.Box 39107-00623,
Nairobi, Kenya.
Telephone: 020 3748551/2/3/4.
Email: info@galaxypharma.co.ke

Manufacturing site address:

Hanuchem Laboratories
1317 – 20, Manpura, Baddi,
Dist. Solan (HP.) 173205.
India.

8. Marketing authorization number

CTD9279.

9. Date of first registration

29/11/2022

10. Date of revision of the text:

16/09/2023

11. Dosimetry:

Not Applicable

12. Instructions for Preparation of Radiopharmaceuticals:

Not Applicable