

SUMMARY OF PRODUCT CHARACTERISTICS

1. Name of the medicinal product

INNOFIX-200 (Cefixime Tablets USP 200 mg)

2. Qualitative and quantitative composition

Each film coated tablet contains:

Cefixime USP as Trihydrate

Eq. to Anhydrous Cefixime 200mg

3. Pharmaceutical form

Solid oral dosage form, film coated tablet

White to off white coloured, round biconvex film coated tablet.

4. Clinical particulars

4.1 Therapeutic indications

Cefixime Tablet is an orally active cephalosporin antibiotic which has marked *in vitro* bactericidal activity against a wide variety of Gram-positive and Gram-negative organisms.

It is indicated for the treatment of the following acute infections when caused by susceptible micro-organisms:

Upper Respiratory Tract Infections (URTI): e.g. otitis media; and other URTI where the causative organism is known or suspected to be resistant to other commonly used antibiotics, or where treatment failure may carry significant risk.

Lower Respiratory Tract Infection: e.g. bronchitis.

Urinary Tract Infections: e.g. cystitis, cystourethritis, uncomplicated pyelonephritis.

Clinical efficacy has been demonstrated in infections caused by commonly occurring pathogens including *Streptococcus pneumoniae*, *Streptococcus pyogenes*, *Escherichia coli*, *Proteus mirabilis*, *Klebsiella* species, *Haemophilus influenzae* (beta-lactamase positive and negative), *Branhamella catarrhalis* (beta- lactamase positive and negative) and *Enterobacter* species. Cefixime is highly stable in the presence of beta-lactamase enzymes.

Most strains of enterococci (*Streptococcus faecalis*, group D Streptococci) and Staphylococci (including coagulase positive and negative strains and meticillin- resistant strains) are resistant to Cefixime. In addition, most strains of *Pseudomonas*, *Bacteriodes fragalis*, *Listeria monocytogenes* and *Clostridia* are resistant to Cefixime.

4.2 Posology and method of administration

Adults

The recommended dose for adults is 200-400 mg daily according to the severity of infection, taken as a single dose (400 mg may also be taken as two divided doses) (see section 5.1).

Elderly patients

Elderly patients may be given the same dose as recommended for adults. Renal function should be assessed and dosage should be adjusted in severe renal impairment (See above and section 4.4).

Adolescents ≥ 12 years of age

Adolescents ≥ 12 years of age may be given the same dose as recommended for adults.

Children from 6 months to 11 years of age

It is recommended that children from 6 months to 11 years of age be given Cefixime as an oral suspension because 200 mg cannot be adequately dosed for this age group. The recommended dosage for children in this age group is 8 mg / kg body weight / day administered as a single dose or in two divided doses.

Children less than 6 months of age

The safety and efficacy of cefixime has not been established in children less than 6 months of age.

Renal insufficiency

Cefixime may be administered in the presence of impaired renal function in adult patients. Normal dose and schedule may be given in adult patients with creatinine clearances of 20 ml/min or greater. In patients whose creatinine clearance is less than 20 ml/min, it is recommended that a dose of 200 mg once daily should not be exceeded. The dose and regimen for patients who are maintained on chronic ambulatory peritoneal dialysis or haemodialysis should follow the same recommendation as that for patients with creatinine clearances of less than 20 ml/min.

There are insufficient data regarding use of cefixime in the pediatric and adolescent age group in the presence of renal insufficiency: the use of cefixime in these patient-groups is not recommended.

Method of administration

Cefixime tablets are for oral administration only. Cefixime tablets should be taken with a sufficient amount of water. Cefixime may be taken with or without food (see section 5.2).

Duration of treatment

The usual course of treatment is 7 days. This may be continued for up to 14 days if required.

4.3 Contraindications

Hypersensitivity to cefixime, other cephalosporin antibiotics or to any of the excipients.

Previous, immediate and/or severe hypersensitivity reaction to penicillin or any beta-lactam antibiotic.

4.4 Special warnings and precautions for use

Cefixime should be given with caution to patients who have shown hypersensitivity to other drugs. Cephalosporins should be given with caution to penicillin-sensitive patients, as there is some evidence of partial cross-allergenicity between the penicillins and cephalosporins. Patients have had severe reactions (including anaphylaxis) to both classes of drugs. Special care is indicated in patients who have experienced any allergic reaction to penicillins or any other beta-lactam antibiotics as cross-reactions may occur (for contraindications due to known hypersensitivity reactions see section 4.3).

If severe hypersensitivity reactions or anaphylactic reactions occur after administration of cefixime, the use of cefixime should be discontinued immediately and appropriate emergency measures should be initiated.

Renal insufficiency

Cefixime should be administered with caution in adult patients with creatinine clearance < 20 ml / min (see sections 4.2 and 5.2). There are insufficient data regarding use of cefixime in the pediatric and adolescent age group in the presence of renal insufficiency: the use of cefixime in these patient-groups is not recommended.

Prolonged use of cefixime may result in the overgrowth of non-susceptible organisms.

Treatment with broad spectrum antibiotics alters the normal flora of the colon and may permit overgrowth of *Clostridia*. Studies indicate that a toxin produced by *Clostridium difficile* is a primary cause of antibiotic-associated diarrhoea.

Pseudomembranous colitis is associated with the use of broad-spectrum antibiotics (including macrolides, semi-synthetic penicillins, lincosamides and cephalosporins including cefixime);

it is therefore important to consider its diagnosis in patients who develop diarrhoea in association with the use of antibiotics.

In patients who develop severe diarrhoea during or after use of cefixime, the risk of life threatening pseudo-membranous colitis should be taken into account (see section 4.8). The use of cefixime should be discontinued and appropriate treatment measures should be established. Management of pseudomembranous colitis should include sigmoidoscopy, appropriate bacteriologic studies, fluids, electrolytes and protein supplementation. If the colitis does not improve after the drug has been discontinued, or if the symptoms are severe, oral vancomycin is the drug of choice for antibiotic-associated pseudomembranous colitis produced by *C. difficile*. Other causes of colitis should be excluded. The use of medicinal products inhibiting the intestinal peristalsis is contra-indicated.

4.5 Interaction with other medicinal products and other forms of interaction

A false positive reaction for glucose in the urine may occur with Benedict's or Fehling's solutions or with copper sulphate test tablets, but not with tests based on enzymatic glucose oxidase reactions.

A false positive direct Coombs' test has been reported during treatment with cephalosporin antibiotics, therefore it should be recognized that a positive Coombs' test may be due to the drug.

In common with other cephalosporins, increases in prothrombin time have been noted in a few patients. Care should therefore be taken in patients receiving anticoagulation therapy.

4.6 Fertility, pregnancy and lactation

Pregnancy:

For cefixime, no clinical data on exposed pregnancies are available. Animal studies do not indicate direct or indirect harmful effects with respect to pregnancy, embryonal/foetal development, parturition or postnatal development (see section 5.3).

Caution should be exercised when prescribing to pregnant women. Cefixime should not be used in pregnant mothers unless considered essential by the physician.

Lactation:

It is unknown whether cefixime is excreted in human breast milk. Animal studies have shown excretion of cefixime in breast milk. A decision on whether to continue/discontinue breast-feeding or to continue/discontinue therapy with cefixime should be made taking into account the benefit of breast-feeding to the child and the benefit of cefixime therapy to the woman.

However, until further clinical experience is available, cefixime should not be prescribed to breast-feeding mothers.

4.7 Effects on ability to drive and use machines

Cefixime has no known influence on the ability to drive and use machines. However, side effects may occur (See also section 4.8), which may influence the ability to drive and use machines.

4.8 Undesirable effects

In this section, the following convention has been used for the classification of undesirable effects in terms of frequency:

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: $< 1/10,000$

MedDRA System Organ Class	Adverse Drug Reaction	Frequency
Infections and infestations	Super infection bacterial, super infection fungal	Rare
	Antibiotic-associated colitis (see section 4.4)	Very rare
Blood and lymphatic system disorders	Eosinophilia	Rare
	Leucopenia, agranulocytosis, pancytopenia, thrombocytopenia, haemolytic anaemia	Very rare
Immune system disorders	Hypersensitivity	Rare
	Anaphylactic shock, serum sickness	Very rare
Metabolism and nutrition disorders	Anorexia	Rare
Nervous system disorders	Headache	Uncommon
	Vertigo	Rare
	Psychomotor hyperactivity	Very rare
Gastrointestinal disorders	Diarrhoea	Common
	Abdominal pain, nausea, vomiting	Uncommon
	Flatulence	Rare

Hepatobiliary disorders	Hepatitis, cholestatic jaundice	Very rare
Skin and subcutaneous tissue disorders	Rash	Uncommon
	Angioneurotic oedema, pruritus	Rare
	Stevens-Johnson syndrome, toxic epidermal necrolysis	Very rare
Renal and urinary disorders	Interstitial nephritis	Very rare
General disorders and administration	Mucosal inflammation, pyrexia	Rare
Investigations	Hepatic enzyme increased (transaminase, alkaline)	Uncommon
	Blood urea increased	Rare
	Blood creatinine increased	Very rare

4.9 Overdose

There is no experience with overdoses with Cefixime.

5. Pharmacological properties

5.1 Pharmacodynamic properties

Pharmacotherapeutic group: ATC code: J01DD08

Mode of Action

Cefixime is an antibacterial agent of the cephalosporin class. Like other cephalosporins, cefixime exerts antibacterial activity by binding to and inhibiting the action of penicillin-binding proteins involved in the synthesis of bacterial cell walls. This leads to bacterial cell lysis and cell death.

PK/PD relationship

The time that the plasma concentration of cefixime exceeds the MIC of the infecting organism has been shown to best correlate with efficacy in PK/PD studies.

Mechanisms of resistance

Bacterial resistance to cefixime may be due to one or more of the following mechanisms:

- Hydrolysis by extended-spectrum beta-lactamases and / or by chromosomally-encoded (AmpC) enzymes that may be induced or de-repressed in certain aerobic gram-negative bacterial species
- Reduced affinity of penicillin-binding proteins
- Reduced permeability of the outer membrane of certain gram-negative organisms restricting access to penicillin-binding proteins
- Drug efflux pumps

More than one of these mechanisms of resistance may co-exist in a single bacterial cell. Depending on the mechanism(s) present, bacteria may express cross-resistance to several or all other beta-lactams and / or antibacterial drugs of other classes.

Breakpoints

Clinical minimum inhibitory concentration (MIC) breakpoints established by EUCAST (May 2009) for Cefixime are:

- *H.influenzae*: sensitive ≤ 0.12 mg/L, resistant > 0.12 mg/L
- *M.catarrhalis*: sensitive ≤ 0.5 mg/L, resistant > 1.0 mg/L
- *Neisseria gonorrhoeae*: sensitive ≤ 0.12 mg/L, resistant > 0.12 mg/L
- *Enterobacteriaceae*: sensitive ≤ 1.0 mg/L, resistant > 1.0 mg/L (for uncomplicated urinary tract infections only). The breakpoints for Enterobacteriaceae will detect reduced susceptibility mediated by most clinically important beta-lactamases in Enterobacteriaceae. Occasional ESBL-producing strains will be reported susceptible. For purposes of infection control, epidemiology and surveillance, laboratories may wish to use specific tests to screen for and confirm ESBL-production.
- Non-species related breakpoints: insufficient data.

Susceptibility

The prevalence of resistance may vary geographically and over 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 the agent in at least some types of infections is questionable.

Commonly susceptible species

<p>Aerobes, Gram positive:</p> <p><i>Streptococcus pneumoniae</i> (Penicillin-susceptible)</p> <p><i>Streptococcus pyogenes</i></p>
<p>Aerobes, Gram negative:</p> <p><i>Escherichia coli</i> %</p> <p><i>Haemophilus influenzae</i></p> <p><i>lebsiella</i> species %</p> <p><i>Moraxella catarrhalis</i></p> <p><i>Proteus mirabilis</i>%</p>
<p>Species for which resistance may be a problem</p>
<p><i>Enterobacter</i> species</p>
<p>Resistant species</p>
<p><i>Clostridium difficile</i></p> <p><i>Bacteroides fragilis</i></p> <p><i>Enterococci</i></p> <p><i>Pseudomonas</i> species</p> <p><i>Staphylococcus aureus</i>⁺</p> <p><i>Streptococcus pneumonia</i> (Penicillin resistant)</p>

% Extended spectrum beta-lactamase (ESBL) producing isolates are always resistant

⁺Cefixime has poor activity against staphylococci (regardless of susceptibility to methicillin)

5.2 Pharmacokinetic properties

Absorption:

The absolute oral bioavailability of cefixime is in the range of 22-54%. Absorption is not significantly modified by the presence of food. Cefixime may therefore be given without regard to meals.

Distribution:

Serum protein binding is well characterized for human and animal sera; cefixime is almost exclusively bound to the albumin fraction, the mean free fraction being approximately 30%. Protein binding of cefixime is only concentration dependent in human serum at very high concentrations which are not seen following clinical dosing.

From *in vitro* studies, serum or urine concentrations of 1 mg/L or greater were considered to be adequate for most common pathogens against which cefixime is active. Typically, the peak serum levels following the recommended adult or paediatric doses are between 1.5 and 3 mg/L. Little or no accumulation of cefixime occurs following multiple dosing.

Metabolism and elimination:

Cefixime is predominantly eliminated as unchanged drug in the urine. Glomerular filtration is considered the predominant mechanism. Metabolites of cefixime have not been isolated from human serum or urine.

Transfer of ¹⁴C-labelled cefixime from lactating rats to their nursing offspring through breast milk was quantitatively small (approximately 1.5% of the mothers' body content of cefixime in the pup). No data are available on secretion of cefixime in human breast milk. Placental transfer of cefixime was small in pregnant rats dosed with labeled cefixime.

Special age groups:

The pharmacokinetics of cefixime in healthy elderly (age > 64 years) and young volunteers (11-35) compared the administration of 400 mg doses once daily for 5 days. Mean C_{max} and AUC values were slightly greater in the elderly. Elderly patients may be given the same dose as the general population (see section 4.2).

5.3 Preclinical safety data

There are no findings from chronic toxicity investigations suggesting that any side effects unknown to date could occur in humans. Furthermore, *invivo* and *invitro* studies did not yield any indication of a potential to cause mutagenicity. Long-term studies on carcinogenicity have not been conducted.

Reproduction studies have been performed in mice and rats at doses up to 400 times the human dose and have revealed no evidence of impaired fertility or harm to the foetus due to cefixime. In the rabbit, at doses up to 4 times the human dose, there was no evidence of a teratogenic effect; there was a high incidence of abortion and maternal death, which is an expected consequence of the known sensitivity of rabbits to antibiotic-induced changes in the population of the microflora of the intestine.

6. Pharmaceutical particulars

6.1 List of excipients

- Microcrystalline Cellulose
- Sodium Starch Glycolate
- Colloidal Silicon Dioxide
- Talc
- Magnesium stearate
- Ready Mix Coating

6.2 Incompatibilities

Not applicable

6.3 Shelf life

24 months.

6.4 Special precautions for storage

Do not Store above 30°C. Protect from light

Keep out of reach of children

6.5 Nature and contents of container

Alu/Alu blister packs

“1 x 10” Tablets packed in a carton along with a PIL.

6.6 Special precautions for disposal and other handling

Any unused product or waste material should be disposed of in accordance with local requirements.

7. Marketing authorization holder & Manufacturer

Manufactured by

Innova Captab Limited

1281/1, Hilltop Industrial Estate,

Near EPIP,Phase –I ,Jharmajari, BADDI

Distt. Solan ,H.P, INDIA

8. Marketing authorization number

08476/09800/NMR/2022

9. Date of authorization

Mar 19, 2023