

1.3 Product information

1.3.1 Summary of Product Characteristics (SmPC)

1. Name of the medicinal product

Ciprofloxacin Hydrochloride Tablets USP 500mg

2. Qualitative and quantitative composition

One caplet contains Ciprofloxacin Hydrochloride Tablets USP 500mg.

For a full list of excipients, see section 6.1.

3. Pharmaceutical form

Caplet.

Almost white Coated Caplet with break line and, Plain on both side

4. Clinical particulars

4.1 Therapeutic indications

Ciprofloxacin 500 mg film-coated tablets are indicated for the treatment of the following infections. Special attention should be paid to available information on resistance to ciprofloxacin before commencing therapy.

Consideration should be given to official guidance on the appropriate use of antibacterial agents.

Adults

Lower respiratory tract infections due to Gram-negative bacteria

- exacerbations of chronic obstructive pulmonary disease
- broncho-pulmonary infections in cystic fibrosis or in bronchiectasis
- pneumonia
- Chronic suppurative otitis media
- Urinary tract infections
- Genital tract infections
- Gonococcal urethritis and cervicitis due to susceptible *Neisseria gonorrhoeae*
- Epididymo-orchitis including cases due to susceptible *Neisseria gonorrhoeae*
- Pelvic inflammatory disease including cases due to susceptible *Neisseria gonorrhoeae* In the above genital tract infections when thought or known to be due to *Neisseria gonorrhoeae* it

is particularly important to obtain local information on the prevalence of resistance to ciprofloxacin and to confirm susceptibility based on laboratory testing.

- Infections of the gastro-intestinal tract (e.g. travellers' diarrhoea)
- Intra-abdominal infections
- Infections of the skin and soft tissue caused by Gram-negative bacteria
- Malignant external otitis
- Infections of the bones and joints
- Treatment of infections in neutropenic patients

Paediatric population

Broncho-pulmonary infections in cystic fibrosis caused by *Pseudomonas aeruginosa*.

Complicated urinary tract infections and pyelonephritis

Inhalation anthrax (post-exposure prophylaxis and curative treatment)

Ciprofloxacin may also be used to treat severe infections in children and adolescents when this is considered to be necessary.

Treatment should be initiated only by physicians who are experienced in the treatment of cystic fibrosis and/or severe infections in children and adolescents.

4.2 Posology and method of administration

Posology

The dosage is determined by the indication, the severity and the site of the infection, the susceptibility to ciprofloxacin of the causative organism(s), the renal function of the patient and, in children and adolescents the body weight.

Treatment of some infections (e.g. pelvic inflammatory disease, intra-abdominal infections, infections in neutropenic patients and infections of bones and joints) may require co-administration with other appropriate antibacterial agents depending on the pathogens involved.

Adults

| Indications | | Daily dose in mg | Total duration of treatment (potentially including initial parenteral treatment with ciprofloxacin) | |
|---|---|--|--|---------------|
| Infections of the lower respiratory tract | | 500mg twice daily to 750 mg twice daily | 7 to 14 days | |
| Infections of the upper respiratory tract | Acute exacerbation of chronic sinusitis | 500 mg twice daily to 750 mg twice daily | 7 to 14 days | |
| | Chronic suppurative otitis media | 500 mg twice daily to 750 mg twice daily | 7 to 14 days | |
| | Malignant external otitis | 750 mg twice daily | 28 days up to 3 months | |
| Urinary tract infections | Uncomplicated cystitis | 250mg twice daily to 500 mg twice daily | 3 days | |
| | In pre-menopausal women, 500 mg single dose may be used | | | |
| | Complicated cystitis, Uncomplicated pyelonephritis | 500 mg twice daily | 7 days | |
| | Complicated pyelonephritis | 500 mg twice daily to 750 mg twice daily | at least 10 days, it can be continued for longer than 21 days in some specific circumstances (such as abscesses) | |
| | Prostatitis | 500 mg twice daily to 750 mg twice daily | 2 to 4 weeks (acute) to 4 to 6 weeks (chronic) | |
| Genital tract infections | Gonococcal and Urethritis cervicitis | 500 mg as a single dose | 1day (single dose) | (single dose) |
| | Epididymo-orchitis and pelvic inflammatory diseases | 500 mg twice daily to 750 mg twice daily | at least 14 days | |
| Infections of the skin and soft tissue | | 500mg twice daily to 750 mg twice daily | 7 to 14 days | |

| | | |
|---|--|---|
| Bone and joint infections | 500 twice daily to 750 mg twice daily | max. of 3 months |
| Treatment of infections or prophylaxis of infections in neutropenic patients Ciprofloxacin should be co-administered with appropriate antibacterial agent(s) in accordance to official guidance. | 500 mg twice daily to 750 mg twice daily | Therapy should be continued over the entire period of neutropenia |
| Prophylaxis of invasive infections due to <i>Neisseria meningitidis</i> | 500 mg as a single dose | 1 days (single dose) |
| Inhalation anthrax post-exposure prophylaxis and curative treatment for persons able to receive treatment by oral route when clinically appropriate. Drug administration should begin as soon as possible after suspected or confirmed exposure | 500 mg twice daily | 60 days from the confirmation of <i>Bacillus anthracis</i> exposure |

Paediatric population

| Indications | Daily dose in mg | Total duration of treatment (potentially including initial parenteral treatment with ciprofloxacin) |
|---|--|---|
| Cystic fibrosis | 20 mg/kg body weight twice daily with a maximum of 750 mg per dose | 10 to 14 days |
| Complicated urinary tract infections and pyelonephritis | 10 mg/kg body weight twice daily to 20 mg/kg body weight twice daily with a maximum of 750 mg per dose | 10 to 21 days |
| Inhalation anthrax post-exposure prophylaxis and curative treatment for persons able to receive treatment by oral route when clinically appropriate. Drug administration should begin as soon as possible after suspected or confirmed exposure | 10 mg/kg body weight twice daily to 15 mg/kg body weight twice daily with a maximum of 500 mg per dose | 60 days from the confirmation of <i>Bacillus anthracis</i> exposure |
| Other severe infections | 20 mg/kg body weight twice daily with a maximum of 750 mg per dose | According to the type of infections |

Elderly Patients

Elderly patients should receive a dose selected according to the severity of the infection and the patient's creatinine clearance.

Renal and hepatic impairment

Recommended starting and maintenance doses for patients with impaired renal function:

| Creatinine clearance [mL/min/1.73 m²] | Serum creatinine [µmol/L] | Oral Dose [mg] |
|---|--------------------------------------|--|
| > 60 | < 124 | See Usual Dosage |
| 30-60 | 124 to 168 | 250-500 mg every 12 h |
| < 30 | > 169 | 250-500 mg every 24 h |
| Patients on haemodialysis | > 169 | 250-500 mg every 24 h (after dialysis) |
| Patients on peritoneal dialysis | > 169 | 250-500 mg every 24 h |

In patients with impaired liver function no dose adjustment is required.

Dosing in children with impaired renal and/or hepatic function has not been studied.

Method of administration:

The tablets are to be swallowed un-chewed with fluid. They can be taken independent of meal times. If taken on an empty stomach, the active substance is absorbed more rapidly. Ciprofloxacin tablets should not be taken with dairy products (e.g. milk, yoghurt) or mineral-fortified fruit-juice (e.g. calcium-fortified orange juice).

In severe cases or if the patient is unable to take tablets (e.g. patients on enteral nutrition), it is recommended to commence therapy with intravenous ciprofloxacin until a switch to oral administration is possible.

4.3 Contraindications

Hypersensitivity to the active substance, to other quinolones. Concomitant administration of ciprofloxacin and tizanidine.

4.4 Special warnings and precautions for use**Severe infections and mixed infections with Gram-positive and anaerobic pathogens**

Ciprofloxacin monotherapy is not suited for treatment of severe infections and infections

that might be due to Gram-positive or anaerobic pathogens. In such infections ciprofloxacin must be co-administered with other appropriate antibacterial agents.

Streptococcal Infections (including *Streptococcus pneumoniae*)

Ciprofloxacin is not recommended for the treatment of streptococcal infections due to inadequate efficacy.

Genital tract infections

Gonococcal urethritis, cervicitis, epididymo-orchitis and pelvic inflammatory diseases may be caused by fluoroquinolone-resistant *Neisseria gonorrhoeae* isolates.

Therefore, ciprofloxacin should be administered for the treatment of gonococcal urethritis or cervicitis only if ciprofloxacin-resistant *Neisseria gonorrhoeae* can be excluded.

For epididymo-orchitis and pelvic inflammatory diseases, empirical ciprofloxacin should be considered in combination with another appropriate antibacterial agent (e.g. a cephalosporin) unless ciprofloxacin-resistant *Neisseria gonorrhoeae* can be excluded. If clinical improvement is not achieved after 3 days of treatment, the therapy should be reconsidered.

Urinary tract infections

Resistance to fluoroquinolones of *Escherichia coli* – the most common pathogen involved in urinary tract infections – varies across the European Union. Prescribers are advised to take into account the local prevalence of resistance in *Escherichia coli* to fluoroquinolones. The single dose of ciprofloxacin that may be used in uncomplicated cystitis in pre-menopausal women is expected to be associated with lower efficacy than the longer treatment duration. This is all the more to be taken into account as regards the increasing resistance level of *Escherichia coli* to quinolones.

Intra-abdominal infections

There are limited data on the efficacy of ciprofloxacin in the treatment of post-surgical intra-abdominal infections.

Travellers' diarrhoea

The choice of ciprofloxacin should take into account information on resistance to ciprofloxacin in relevant pathogens in the countries visited.

Infections of the bones and joints

Ciprofloxacin should be used in combination with other antimicrobial agents depending on the results of the microbiological documentation.

Inhalational anthrax

Use in humans is based on *in-vitro* susceptibility data and on animal experimental data together with limited human data. Treating physicians should refer to national and/or international consensus documents regarding the treatment of anthrax.

Paediatric population

The use of ciprofloxacin in children and adolescents should follow available official guidance. Ciprofloxacin treatment should be initiated only by physicians who are experienced in the treatment of cystic fibrosis and/or severe infections in children and adolescents.

Ciprofloxacin has been shown to cause arthropathy in weight-bearing joints of immature animals. Safety data from a randomised double-blind study on ciprofloxacin use in children (ciprofloxacin: n=335, mean age = 6.3 years; comparators: n=349, mean age = 6.2 years; age range = 1 to 17 years) revealed an incidence of suspected drug-related arthropathy (discerned from joint-related clinical signs and symptoms) by Day +42 of 7.2% and 4.6%. Respectively, an incidence of drug-related arthropathy by 1-year follow-up was 9.0% and 5.7%. The increase of suspected drug-related arthropathy cases over time was not statistically significant between groups. Treatment should be initiated only after a careful benefit/risk evaluation, due to possible adverse events related to joints and/or surrounding tissue.

Broncho-pulmonary infections in cystic fibrosis

Clinical trials have included children and adolescents aged 5-17 years. More limited experience is available in treating children between 1 and 5 years of age.

Complicated urinary tract infections and pyelonephritis

Ciprofloxacin treatment of urinary tract infections should be considered when other treatments cannot be used, and should be based on the results of the microbiological documentation.

Clinical trials have included children and adolescents aged 1-17 years. **Other specific severe infections**

Other severe infections in accordance with official guidance, or after careful benefit-risk evaluation when other treatments cannot be used, or after failure to conventional therapy and when the microbiological documentation can justify ciprofloxacin use.

The use of ciprofloxacin for specific severe infections other than those mentioned above has not been evaluated in clinical trials and the clinical experience is limited.

Consequently, caution is advised when treating patients with these infections.

4.5 Interaction with other medicinal products and other forms of interaction

Effects of other products on ciprofloxacin:

Drugs known to prolong QT interval

Ciprofloxacin, like other fluoroquinolones, should be used with caution in patients receiving drugs known to prolong QT interval (e.g. Class IA and III anti-arrhythmics, tricyclic antidepressants, macrolides, antipsychotics).

Chelation Complex Formation

The simultaneous administration of ciprofloxacin (oral) and multivalent cation-containing drugs and mineral supplements (e.g. calcium, magnesium, aluminium, iron), polymeric phosphate binders (e.g. sevelamer), sucralfate or antacids, and highly buffered drugs (e.g. didanosine tablets) containing magnesium, aluminium, or calcium reduces the absorption of ciprofloxacin. Consequently, ciprofloxacin should be administered either 1-2 hours before or at least 4 hours after these preparations. The restriction does not apply to antacids belonging to the class of H₂ receptor blockers.

Food and Dairy Products

Dietary calcium as part of a meal does not significantly affect absorption. However, the concurrent administration of dairy products or mineral-fortified drinks alone (e.g. milk, yoghurt, calcium-fortified orange juice) with ciprofloxacin should be avoided because absorption of ciprofloxacin may be reduced.

Probenecid

Probenecid interferes with renal secretion of ciprofloxacin. Co-administration of probenecid and ciprofloxacin increases ciprofloxacin serum concentrations.

Metoclopramide

Metoclopramide accelerates the absorption of ciprofloxacin (oral) resulting in a shorter time to reach maximum plasma concentrations. No effect was seen on the bioavailability of ciprofloxacin.

Omeprazole

Concomitant administration of ciprofloxacin and omeprazole containing medicinal products results in a slight reduction of C_{max} and AUC of ciprofloxacin

Effects of ciprofloxacin on other medicinal products:

Tizanidine

Tizanidine must not be administered together with ciprofloxacin (see section 4.3). In a clinical study with healthy subjects, there was an increase in serum tizanidine concentration (C_{max} increase: 7-fold, range: 4 to 21-fold; AUC increase: 10-fold, range: 6 to 24-fold) when given concomitantly with ciprofloxacin. Increased serum tizanidine concentration is associated with a potentiated hypotensive and sedative effect.

Methotrexate

Renal tubular transport of methotrexate may be inhibited by concomitant administration of ciprofloxacin, potentially leading to increased plasma levels of methotrexate and increased risk of methotrexate-associated toxic reactions. The concomitant use is not recommended.

Theophylline

Concurrent administration of ciprofloxacin and theophylline can cause an undesirable increase in serum theophylline concentration. This can lead to theophylline-induced side effects that may rarely be life threatening or fatal. During the combination, serum theophylline concentrations should be checked and the theophylline dose reduced as necessary.

Other xanthine derivatives

On concurrent administration of ciprofloxacin and caffeine or pentoxifylline (oxpentifylline), raised serum concentrations of these xanthine derivatives were reported.

Phenytoin

Simultaneous administration of ciprofloxacin and phenytoin may result in increased or reduced serum levels of phenytoin such that monitoring of drug levels is recommended.

Ciclosporin

A transient rise in the concentration of serum creatinine was observed when ciprofloxacin and ciclosporin containing medicinal products were administered simultaneously. Therefore, it is frequently (twice a week) necessary to control the serum creatinine concentrations in these patients.

Lidocaine

It was demonstrated in healthy subjects that concomitant use of lidocaine containing medicinal products with ciprofloxacin, a moderate inhibitor of CYP450 1A2 isozyme, reduces clearance of intravenous lidocaine by 22%. Although lidocaine treatment was well tolerated, a possible interaction with ciprofloxacin associated with side effects may occur upon concomitant administration.

Clozapine

Following concomitant administration of 250 mg ciprofloxacin with clozapine for 7 days, serum concentrations of clozapine and N-desmethylclozapine were increased by 29% and 31%, respectively. Clinical surveillance and appropriate adjustment of clozapine dosage during and shortly after coadministration with ciprofloxacin are advised.

Sevelamer

The bioavailability of ciprofloxacin is reduced by the concomitant administration with sevelamer (up to 50%), therefore, it is recommended that the two should not be taken concomitantly.

Sildenafil

C_{max} and AUC of sildenafil were increased approximately twofold in healthy subjects after an oral dose of 50 mg given concomitantly with 500 mg ciprofloxacin. Therefore, caution should be used prescribing ciprofloxacin concomitantly with sildenafil taking into consideration the risks and the benefits.

Zolpidem

Co-administration of ciprofloxacin may increase blood levels of zolpidem; concurrent use is not recommended.

4.6 Fertility, pregnancy and lactation

The data that are available on administration of ciprofloxacin to pregnant women indicates no malformative or foeto/neonatal toxicity of ciprofloxacin. Animal studies do not indicate direct or indirect harmful effects with respect to reproductive toxicity. In juvenile and prenatal animals exposed to quinolones, effects on immature cartilage have been observed, thus, it cannot be excluded that the drug could cause damage to articular cartilage in the human immature organism / foetus.

Breast-feeding

Ciprofloxacin is excreted in breast milk. Due to the potential risk of articular damage, ciprofloxacin should not be used during breast-feeding.

4.7 Effects on ability to drive and use machines

Due to its neurological effects, ciprofloxacin may affect reaction time. Thus, the ability to drive or to operate machinery may be impaired.

4.8 Undesirable effects

Summary of the safety profile

The most commonly reported adverse drug reactions (ADRs) are nausea and diarrhoea.

Tabulated list of adverse reactions

ADRs derived from clinical studies and post-marketing surveillance with Ciprofloxacin (oral, intravenous, and sequential therapy) sorted by categories of frequency are listed below. The frequency analysis takes into account data from both oral and intravenous administration of ciprofloxacin.

| System Organ Class | 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 | Frequency not known (cannot be estimated from available data) |
|--------------------|-------------------------------|------------------------------------|-----------------------------------|----------------------|---|
| Infections and | | Mycotic superinfection | | | |

| | | | | | |
|--------------------------------------|--|--------------|--|---|--|
| Blood and Lymphatic System Disorders | | Eosinophilia | Leukopenia Anaemia Neutropenia Leukocytosis Thrombocytopenia Thrombocytæmia | Haemolytic anaemia Agranulocytosis Pancytopenia (life-threatening) Bone marrow depression (life- | |
| Immune System Disorders | | | Allergic reaction Allergic oedema / angioedema | Anaphylactic reaction Anaphylactic shock (life-threatening) Serum sickness-like reaction | |

| | | | | | |
|---|--|---|---|---|--|
| Nervous System Disorders | | Headache Dizziness Sleep disorders Taste disorders | Par- and Dyaesthesia Hypoaesthesia Tremor Seizures (including status epilepticus) Vertigo | Migraine Disturbed coordination Gait disturbance Olfactory nerve disorders pseudotumour cerebri | Peripheral neuropathy and polyneuropathy |
| Eye Disorders | | | Visual disturbances | Visual colour distortions | |
| Ear and Labyrinth Disorders | | | Tinnitus Hearing loss / Hearing impaired | | |
| Cardiac Disorders | | | Tachycardia | | Ventricular arrhythmia and torsades de pointes, ECG QT prolonged |
| Vascular Disorders | | | Vasodilatation Hypotension | Vasculitis | |
| Respiratory, Thoracic and Mediastinal Disorders | | | Dyspnoea (including asthmatic condition) | | |

| | | | | | |
|---|--------------------|---|---|--|---|
| Gastrointestinal Disorders | Nausea Diarrhea | Vomiting Gastrointestinal and abdominal pains Dyspepsia | Antibiotic associated diarrhoea including pseudomembranous colitis | Pancreatitis | |
| Hepatobiliary Disorders | | Increase in transaminases Increased bilirubin | Hepatic impairment Cholestatic icterus Hepatitis | Liver necrosis (very rarely progressing to life-threatening) | |
| Skin and Subcutaneous Tissue Disorders | | Rash Pruritus Urticaria | Photosensitivity reactions | Petechiae Erythema multiforme Erythema nodosum Stevens-Johnson syndrome Toxic epidermal necrolysis | Acute generalised exanthematous pustulosis (AGEP) Drug Reaction with Eosinophilia and Systemic Symptoms (DRESS) |
| Musculoskeletal, Connective Tissue and Bone Disorders | | Musculoskeletal pain (e.g. extremity pain, back pain, chest pain) Arthralgia | Myalgia Arthritis Increased muscle tone and cramping | Muscular weakness Tendinitis Tendon rupture (predominantly | |
| | | | | Achilles tendon) Exacerbation of symptoms of myasthenia gravis | |
| Renal and Urinary Disorders | | Renal impairment | Renal failure Haematuria Crystalluria Tubulointerstitial nephritis | | |
| General Disorders and Administration Site Conditions | | Asthenia Fever | Oedema Sweating (hyperhidrosis) | | |

| | | | | | |
|----------------|--|--|---|--|--|
| Investigations | | Increase in blood alkaline phosphatase | Prothrombin level abnormal Increased amylase | | International normalised ratio increased (in patients treated with Vitamin K |
|----------------|--|--|---|--|--|

4.9 Overdose

An overdose of 12 g has been reported to lead to mild symptoms of toxicity. An acute overdose of 16 g has been reported to cause acute renal failure. Symptoms in overdose consist of dizziness, tremor, headache, tiredness, seizures, hallucinations, confusion, abdominal discomfort, renal and hepatic impairment as well as crystalluria and haematuria.

Reversible renal toxicity has been reported.

Apart from routine emergency measures, it is recommended to monitor renal function, including urinary pH and acidify, if required, to prevent crystalluria. Patients should be kept well hydrated. Only a small quantity of ciprofloxacin (<10%) is eliminated by haemodialysis or peritoneal dialysis.

In the event of overdose, symptomatic treatment should be implemented. ECG monitoring should be undertaken, because of the possibility of QT interval prolongation.

5. Pharmacological properties

5.1 Pharmacodynamic properties

Pharmacotherapeutic group: Ciprofloxacin is a synthetic 4-quinolone derivative antibacterial agent of the fluoroquinolone class., ATC code: J 01 MA 02. **Mechanism of action**

As a fluoroquinolone antibacterial agent, ciprofloxacin acts on the DNA-DNA-gyrase complex and topoisomerase IV.

Spectrum of activity:

Breakpoints:

BSAC: S [1mg/L; R μ 2mg/l, except Pseudomonas R μ 8mg/ml and UTI R μ 8mg/L. NCCLS: S [1mg/l; I = 2mg/l; R μ 4mg/l.

Susceptibility

The prevalence of the acquired resistances can vary for some species geographically and with time. Therefore, it is important to obtain information on local resistance patterns, particularly when treating more severe infections.

The information provided below gives only an approximate guidance on probabilities whether micro-organisms will be susceptible to ciprofloxacin or not.

| Organism | Prevalence of Resistance |
|--|--------------------------|
| Sensitive: | |
| Gram-positive bacteria | |
| <i>Staphylococcus aureus</i> (methicillin sensitive) | 0-14% |
| <i>Streptococcus agalactiae</i> | 0-17% |
| Gram-negative bacteria | |
| <i>Acinetobacter baumannii</i> | 6-93% |
| <i>Acinetobacter</i> spp. | 14-70% |
| <i>Aeromonas hydrophila</i> | |

| | |
|----------------------------------|-------|
| <i>Campylobacter jejuni/coli</i> | 0-82% |
| <i>Citrobacter freundii</i> | 0-4% |
| <i>Enterobacter aerogenes</i> | |
| <i>Enterobacter cloacae</i> | 0-3% |
| <i>Enterobacter</i> spp | 3-13% |
| <i>Escherichia coli</i> | 2-7% |
| <i>Haemophilus influenzae</i> | 0-1% |
| <i>Klebsiella</i> spp. | 2-21% |
| <i>Moraxella catarrhalis</i> | |
| <i>Morganella morganii</i> | 1-2% |
| <i>Neisseria gonorrhoeae</i> | 5% |
| <i>Proteus mirabilis</i> | 0-10% |
| <i>Proteus vulgaris</i> | 4% |
| <i>Providencia</i> spp. | 4% |
| <i>Pseudomonas aeruginosa</i> | 1-28% |
| <i>Salmonella</i> spp. | |
| <i>Serratia liquefaciens</i> | |
| <i>Serratia marcescens</i> | 23% |

| | |
|--|--------|
| Anaerobes* | |
| <i>Peptococcus spp.</i> | - |
| <i>Peptostreptococcus spp.</i> | - |
| <i>Veillonella parvula</i> | - |
| Other pathogens | |
| <i>Legionella pneumophila</i> | - |
| Intermediate | |
| <i>Viridans streptococci</i> | 5-9% |
| <i>Streptococcus pneumoniae</i> | 2.8% |
| <i>Streptococcus pyogenes</i> | 2.8% |
| Other pathogens | |
| <i>Chlamydia spp</i> | - |
| Resistant | |
| Gram-positive aerobes | |
| <i>Enterococcus spp</i> | - |
| <i>Staphylococcus aureus</i> (methicillin resistant) | 48-90% |
| Gram-negative aerobes | |
| <i>Stenotrophomonas maltophilia</i> | - |
| <i>Flavobacterium meningosepticum</i> | - |
| <i>Nocardia asteroides</i> | - |
| Anaerobes | |
| <i>Bacteroides fragilis</i> | - |
| <i>Bacteroides thetaiotaomicron</i> | - |
| <i>Clostridium difficile</i> | - |

* Ciprofloxacin is not considered the drug of first choice for treatment of infections with anaerobes.

5.2 Pharmacokinetic properties

Absorption

After oral administration, ciprofloxacin is predominantly absorbed from the duodenum and upper jejunum, and reaches peak serum concentrations within 60-90 min. After single doses of 250mg and 500mg Cmax values are about 0.8-2.0mg/1 and 1.5-2.9mg/1 respectively.

The absolute bioavailability is approximately 70 to 80%. C_{max}- and AUC-values are proportionally increased with the dose.

Food intake has no effect on the plasma concentration profile of ciprofloxacin.

Distribution

The steady-state volume of distribution of ciprofloxacin is 2-3 l/kg. Since the protein binding of ciprofloxacin is low (20-30%) and the substance is predominantly present in the blood plasma in non-ionised form, almost the entire quantity of the administered dose can diffuse freely into the extravasal space. As a result, the concentrations in certain body fluids and tissues may be markedly higher than the corresponding serum concentrations. **Metabolism**

/ Elimination

Ciprofloxacin is essentially excreted in unchanged form, mostly in the urine. Renal clearance lies between 3 and 5ml/min/kg, and total clearance amounts to 8-10ml/min/kg. Both glomerular filtration and tubular secretion play a part in the elimination of ciprofloxacin.

Small concentrations of 4 metabolites were found: desethylene ciprofloxacin (M 1), sulphociprofloxacin (M 2), oxociprofloxacin (M 3) and formylciprofloxacin (M 4). M 1 to M 3 show antibacterial activity comparable with or smaller than nalidixic acid. M 4 with the lowest quantity has an antimicrobial activity very much corresponding to norfloxacin.

5.3 Preclinical safety data

Like other gyrase inhibitors, ciprofloxacin may induce joint damage during the growth phase of juvenile animals. Other preclinical effects were observed only at exposures, sufficiently in excess of the maximum human exposure, that make concern for human safety negligible in respect of animal data.

6. Pharmaceutical particulars

6.1 List of excipients

Maize Starch
Microcrystalline Cellulose (PH101) Povidone
(PVP K-30)
Pregelatinated Starch
Methyl Paraben
Propyl Paraben
Anhydrous Colloidal silicon dioxide (Aerosil 200)
Sodium Starch Glycolate
Talc
Magnesium Stearate
Colour con Opadry White Isopropyl
Alcohol

6.2 Incompatibilities

Not applicable.

6.3 Shelf life

3 years

6.4 Special precautions for storage

Do not store above 30°C.

6.5 Nature and contents of container

ALU/ALU blisters.

6.6 Special precautions for disposal and other handling

None

7. Applicant

CHEZ RESOURCES PHARMA. LTD

7 Calabar street Fegee
Onitsha
Anambra State

8. Reference/Authorisation number(s)

Not applicable

9. Date of first authorisation/renewal of the authorisation

Not applicable

10. Date of revision of the text

20 February 2020.