

# Zyrtec Oral Solution 0.1%

## 1. NAME OF THE MEDICINAL PRODUCT

Zyrtec Oral Solution 0.1%

## 2. QUALITATIVE AND QUANTITATIVE COMPOSITION

Each 1 ml of solution contains 1 mg of cetirizine dihydrochloride.

Excipients with known effect:

- one ml of solution contains 450 mg sorbitol (solution at 70 %, non crystallising)
- one ml of solution contains 1.35 mg methylparahydroxybenzoate
- one ml of solution contains 0.15 mg propylparahydroxybenzoate

For the full list of excipients, see section 6.1

## 3. PHARMACEUTICAL FORM

Oral solution

Clear and colourless liquid with slightly sweet taste and a banana flavour

## 4. CLINICAL PARTICULARS

### 4.1 Therapeutic indications

Zyrtec Oral Solution 0.1% is indicated in adults and children aged 2 years and above:

- for the relief of nasal and ocular symptoms of seasonal and perennial allergic rhinitis.
- for the relief of symptoms of chronic idiopathic urticaria.

### 4.2 Posology and method of administration

#### Posology

10 mg once daily (10 ml oral solution (2 full spoons)).

#### Special population

##### *Elderly*

Data do not suggest that the dose needs to be reduced in elderly subjects provided that the renal function is normal.

##### *Renal impairment*

There are no data to document the efficacy/safety ratio in patients with renal impairment. Since cetirizine is mainly eliminated via renal route (see section 5.2), in cases no alternative treatment can be used, the dosing intervals must be individualized according to renal function. Refer to the following table and adjust the dose as indicated. To use this dosing table an estimate of the patient's creatinine clearance ( $Cl_{cr}$ ) in ml/min is needed. The  $Cl_{cr}$  (ml/min) may be estimated from serum creatinine (mg/dl) determination using the following formula:

$$Cl_{cr} = \frac{[140 - \text{age (years)}] \times \text{weight (kg)}}{72 \times \text{serum creatinine (mg/dl)}} \quad (\times 0.85 \text{ in women})$$

#### Dosing adjustments for adult patients with impaired renal function

Group	Creatinine clearance (ml/min)	Dosage and frequency
Normal	≥80	10mg once daily
Mild	50-79	10mg once daily
Moderate	30-49	5 mg once daily
Severe	<30	5 mg once every 2 days
End-stage renal disease - Patients undergoing dialysis	<10	Contraindicated

#### *Hepatic impairment*

No dose adjustment is needed in patients with solely hepatic impairment. In patients with hepatic impairment and renal impairment, adjustment of the dose is recommended (see *Renal impairment* above).

#### *Paediatric population*

Children aged from 2 to 6 years: 2.5 mg twice daily (2.5 ml oral solution twice daily (a half spoon twice daily)).

Children aged from 6 to 12 years: 5 mg twice daily (5 ml oral solution twice daily (a full spoon twice daily)).

Adolescents over 12 years of age: 10 mg once daily (10 ml oral solution once daily (2 full spoons)).

In paediatric patients suffering from renal impairment, the dose will have to be adjusted on an individual basis taking into account the renal clearance, age and body weight of the patient.

#### Method of administration:

The solution can be swallowed as such.

### **4.3 Contraindications**

Cetirizine is contraindicated in:

- hypersensitivity to the active substance, to any of the excipients listed in section 6.1, to hydroxyzine or to any piperazine derivatives
- patients with severe renal impairment with a creatinine clearance below 10 ml/min.

### **4.4 Special warnings and precautions for use**

At therapeutic doses, no clinically significant interactions have been demonstrated with alcohol (for a blood alcohol level of 0.5 g/L). Nevertheless, precaution is recommended if alcohol is taken concomitantly.

Caution should be taken in patients with predisposition factors of urinary retention (e.g. spinal cord lesion, prostatic hyperplasia) as cetirizine may increase the risk of urinary retention.

Caution is recommended in epileptic patients and patients at risk of convulsions.

Methyl parahydroxybenzoate and propyl parahydroxybenzoate may cause allergic reactions (possibly delayed).

Patients with rare hereditary problems of fructose intolerance should not take Zyrtec Oral Solution 0.1%.

Response to allergy skin tests are inhibited by antihistamines and a wash-out period (of 3 days) is required before performing them.

Pruritus and/or urticaria may occur when cetirizine is stopped, even if those symptoms were not present before treatment initiation. In some cases, the symptoms may be intense and may require treatment to be restarted. The symptoms should resolve when the treatment is restarted.

#### Paediatric population

Due to the amount of some excipients in the formulation, the use of the product is not recommended in children aged less than 2 years.

### **4.5 Interaction with other medicinal products and other forms of interaction**

Due to the pharmacokinetic, pharmacodynamic and tolerance profile of cetirizine, no interactions are expected with this antihistamine. Actually, neither pharmacodynamic nor significant pharmacokinetic interaction was reported in drug-drug interactions studies performed, notably with pseudoephedrine or theophylline (400mg/ day).

The extent of absorption of cetirizine is not reduced with food, although the rate of absorption is decreased.

In sensitive patients, the concurrent use of alcohol or other CNS depressants may cause additional reductions in alertness and impairment of performance although cetirizine does not potentiate the effect of alcohol (0.5 g/l blood levels).

### **4.6 Fertility, pregnancy and lactation**

#### Pregnancy

For cetirizine prospectively collected data on pregnancy outcomes do not suggest potential for maternal or foetal/embryonic toxicity above background rates.

Animal studies do not indicate direct or indirect harmful effects with respect to pregnancy, embryonal/foetal development, parturition or postnatal development. Caution should nevertheless be exercised when prescribing to pregnant women.

#### Breastfeeding

Cetirizine passes into breast milk. A risk of side effects in breastfed infants cannot be excluded. Cetirizine is excreted in human milk at concentrations representing 25% to 90% of those measured in plasma, depending on sampling time after administration. Therefore, caution should be exercised when prescribing cetirizine to lactating women.

#### Fertility

Limited data is available on human fertility but no safety concern has been identified.

Animal data show no safety concern for human reproduction.

### **4.7 Effects on ability to drive and use machines**

Objective measurements of driving ability, sleep latency and assembly line performance have not demonstrated any clinically relevant effects at the recommended dose of 10 mg. However, patients who experience somnolence should refrain from driving, engaging in potentially hazardous activities or operating machinery. They should not exceed the recommended dose and should take their response to the medicinal product into account.

### **4.8 Undesirable effects**

## Clinical studies

### Overview

Clinical studies have shown that cetirizine at the recommended dosage has minor undesirable effects on the CNS, including somnolence, fatigue, dizziness and headache. In some cases, paradoxical CNS stimulation has been reported.

Although cetirizine is a selective antagonist of peripheral H<sub>1</sub>-receptors and is relatively free of anticholinergic activity, isolated cases of micturition difficulty, eye accommodation disorders and dry mouth have been reported.

Instances of abnormal hepatic function with elevated hepatic enzymes accompanied by elevated bilirubin have been reported. Mostly this resolves upon discontinuation of the treatment with cetirizine dihydrochloride.

### Listing of ADRs

Double blind controlled clinical trials comparing cetirizine to placebo or other antihistamines at the recommended dosage (10 mg daily for cetirizine), of which quantified safety data are available, included more than 3200 subjects exposed to cetirizine.

From this pooling, the following adverse reactions were reported for cetirizine 10 mg in the placebo-controlled trials at rates of 1.0 % or greater:

<b>Adverse reactions (WHO-ART)</b>	<b>Cetirizine 10 mg (n = 3260)</b>	<b>Placebo (n = 3061)</b>
<b>General disorders and administration site conditions</b>		
Fatigue	1.63%	0.95%
<b>Nervous system disorders</b>		
Dizziness	1.10%	0.98%
Headache	7.42%	8.07%
<b>Gastro-intestinal disorders</b>		
Abdominal pain	0.98%	1.08%
Dry mouth	2.09%	0.82%
Nausea	1.07%	1.14%
<b>Psychiatric disorders</b>		
Somnolence	9.63%	5.00%
<b>Respiratory, thoracic and mediastinal disorders</b>		
Pharyngitis	1.29%	1.34%

Although statistically more common than under placebo, somnolence was mild to moderate in the majority of cases. Objective tests as demonstrated by other studies have demonstrated that usual daily activities are unaffected at the recommended daily dose in healthy young volunteers.

### Paediatric population

Adverse reactions at rates of 1 % or greater in children aged from 6 months to 12 years, included in placebo-controlled clinical trials are:

<b>Adverse reactions (WHO-ART)</b>	<b>Cetirizine 10 mg (n = 1656)</b>	<b>Placebo (n = 1294)</b>
<b>Gastro-intestinal disorders</b>		
Diarrhoea	1.0%	0.6%
<b>Psychiatric disorders</b>		
Somnolence	1.8%	1.4%
<b>Respiratory, thoracic and mediastinal disorders</b>		
Rhinitis	1.4%	1.1%
<b>General disorders and administration site conditions</b>		
Fatigue	1.0%	0.3%

### Post-marketing experience

In addition to the adverse reactions reported during clinical studies and listed above, the following undesirable effects have been reported in post-marketing experience. Undesirable effects are described according to MedDRA System Organ Class and by estimated frequency based on post-marketing experience.

Frequencies are defined as follows:

Very common	≥1/10
Common	≥1/100 to <1/10
Uncommon	≥1/1000 to <1/100
Rare	≥1/10000 to <1/1000
Very rare	<1/10000
Not known	(cannot be estimated from the available data)

- Blood and lymphatic disorders:  
Very rare: thrombocytopenia
- Immune system disorders:  
Rare: hypersensitivity  
Very rare: anaphylactic shock
- Metabolism and nutrition disorders  
Not known: increased appetite
- Psychiatric disorders:  
Uncommon: agitation  
Rare: aggression, confusion, depression, hallucination, insomnia  
Very rare: tics  
Not known: suicidal ideation, nightmare
- Nervous system disorders:  
Uncommon: paraesthesia  
Rare: convulsions  
Very rare: dysgeusia, dyskinesia, dystonia, syncope, tremor  
Not known: amnesia, memory impairment
- Eye disorders:  
Very rare: accommodation disorder, blurred vision, oculogyration
- Ear and labyrinth disorders  
Not known: vertigo
- Cardiac disorders:  
Rare: tachycardia
- Gastro-intestinal disorders:  
Uncommon: diarrhoea
- Hepatobiliary disorders:  
Rare: hepatic function abnormal (increased transaminases, alkaline phosphatase,  $\gamma$ -GT and bilirubin )  
Not known: hepatitis
- Skin and subcutaneous tissue disorders:  
Uncommon: pruritus, rash  
Rare: urticaria  
Very rare: angioneurotic oedema, fixed drug eruption

Not known: acute generalised exanthematous pustulosis

- Musculoskeletal and connective tissue disorders:  
Not known: arthralgia
- Renal and urinary disorders:  
Very rare: dysuria, enuresis  
Not known: urinary retention
- General disorders and administration site conditions:  
Uncommon: asthenia, malaise  
Rare: oedema
- Investigations:  
Rare: weight increased

Description of selected adverse reactions

After discontinuation of cetirizine, pruritus (intense itching) and/or urticaria have been reported

## 4.9 Overdose

### Symptoms

Symptoms observed after an overdose of cetirizine are mainly associated with CNS effects or with effects that could suggest an anticholinergic effect.

Adverse events reported after an intake of at least 5 times the recommended daily dose are: confusion, diarrhoea, dizziness, fatigue, headache, malaise, mydriasis, pruritus, restlessness, sedation, somnolence, stupor, tachycardia, tremor, and urinary retention.

### Management

There is no known specific antidote to cetirizine.

Should overdose occur, symptomatic or supportive treatment is recommended. Gastric lavage may be considered shortly after ingestion of the drug.

Cetirizine is not effectively removed by haemodialysis.

## 5. Pharmacological properties

### 5.1 Pharmacodynamic properties

Pharmacotherapeutic group: Antihistamine for systemic use, piperazine derivatives, ATC code: R06A E07

### Mechanism of action

Cetirizine, a human metabolite of hydroxyzine, is a potent and selective antagonist of peripheral H<sub>1</sub>-receptors. *In vitro* receptor binding studies have shown no measurable affinity for other than H<sub>1</sub>-receptors.

### Pharmacodynamic effects

In addition to its anti-H<sub>1</sub> effect, cetirizine was shown to display anti-allergic activities: at a dose of 10 mg once or twice daily, it inhibits the late phase recruitment of eosinophils, in the skin and conjunctiva of atopic subjects submitted to allergen challenge.

### Clinical efficacy and safety

Studies in healthy volunteers show that cetirizine, at doses of 5 and 10 mg strongly inhibits the wheal and flare reactions induced by very high concentrations of histamine into the skin, but the correlation with efficacy is not established.

In a six-week, placebo-controlled study of 186 patients with allergic rhinitis and concomitant mild to moderate asthma, cetirizine 10 mg once daily improved rhinitis symptoms and did not alter pulmonary function. This study supports the safety of administering cetirizine to allergic patients with mild to moderate asthma.

In a placebo-controlled study, cetirizine given at the high daily dose of 60 mg for seven days did not cause statistically significant prolongation of QT interval.

At the recommended dosage, cetirizine has demonstrated that it improves the quality of life of patients with perennial and seasonal allergic rhinitis.

### Paediatric population

In a 35-day study in children aged 5 to 12, no tolerance to the antihistaminic effect (suppression of wheal and flare) of cetirizine was found. When a treatment with cetirizine is stopped after repeated administration, the skin recovers its normal reactivity to histamine within 3 days.

## **5.2 Pharmacokinetic properties**

### Absorption

The steady - state peak plasma concentrations is approximately 300 ng/ml and is achieved within  $1.0 \pm 0.5$  h. The distribution of pharmacokinetic parameters such as peak plasma concentration ( $C_{max}$ ) and area under curve (AUC) is unimodal.

The extent of absorption of cetirizine is not reduced with food, although the rate of absorption is decreased. The extent of bioavailability is similar when cetirizine is given as solutions, capsules or tablets.

### Distribution

The apparent volume of distribution is 0.50 l/kg. Plasma protein binding of cetirizine is  $93 \pm 0.3$  %. Cetirizine does not modify the protein binding of warfarin.

### Biotransformation

Cetirizine does not undergo extensive first pass metabolism.

### Elimination

The terminal half-life is approximately 10 hours and no accumulation is observed for cetirizine following daily doses of 10 mg for 10 days. About two third of the dose are excreted unchanged in urine.

### Linearity/Non-linearity

Cetirizine exhibits linear kinetics over the range of 5 to 60 mg.

*Renal impairment:* The pharmacokinetics of the drug was similar in patients with mild impairment (creatinine clearance higher than 40 ml/min) and healthy volunteers. Patients with moderate renal impairment had a 3-fold increase in half-life and 70 % decrease in clearance compared to healthy volunteers.

Patients on hemodialysis (creatinine clearance less than 7 ml/min) given a single oral 10 mg dose of cetirizine had a 3-fold increase in half-life and a 70 % decrease in clearance compared to normals. Cetirizine was poorly cleared by haemodialysis. Dosing adjustment is necessary in patients with moderate or severe renal impairment (see section 4.2).

*Hepatic impairment:* Patients with chronic liver diseases (hepatocellular, cholestatic, and biliary cirrhosis) given 10 or 20 mg of cetirizine as a single dose had a 50 % increase in half-life along with a 40 % decrease in clearance compared to healthy subjects.

Dosing adjustment is only necessary in patients with hepatic impairment if concomitant renal impairment is present.

*Elderly:* Following a single 10 mg oral dose, half-life increased by about 50 % and clearance decreased by 40 % in 16 elderly subjects compared to the normal subjects. The decrease in cetirizine clearance in these elderly volunteers appeared to be related to their decreased renal function.

*Paediatric population:* The half-life of cetirizine was about 6 hours in children of 6-12 years and 5 hours in children 2-6 years. In infants and toddlers aged 6 to 24 months, it is reduced to 3.1 hours.

### **5.3 Preclinical safety data**

Non-clinical data reveal no special hazard for humans based on conventional studies of safety pharmacology, repeated dose toxicity, genotoxicity, carcinogenic potential, toxicity to reproduction.

## **6. Pharmaceutical particulars**

### **6.1 List of excipients**

Sorbitol solution at 70% (non-crystallising)

Glycerol (85%)

Propylene glycol

Saccharin sodium

Methyl parahydroxybenzoate

Propyl parahydroxybenzoate

Banana flavour 54.330/A

Sodium acetate

Glacial acetic acid

Purified water

### **6.2 Incompatibilities**

Not applicable

### **6.3 Shelf life**

See outer packaging for storage and expiry date.

### **6.4 Special precautions for storage**

See outer packaging for storage and expiry date.

### **6.5 Special precautions for disposal and other handling**

No special requirements

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

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