MUCINAC 600 Tablets (Acetylcysteine)

Composition

MUCINAC 600 Tablets

Each effervescent tablet contains:

Acetylcysteine..... 600 mg

Dosage Form

Oral Tablet

Pharmacology

Pharmacodynamics

Acetylcysteine, also known as N-acetylcysteine is the N-acetyl derivative of the natural amino acid, L-cysteine, which in the body serves as a substrate for the synthesis of glutathione.

As a Mucolytic Agent

The viscosity of pulmonary mucus secretions depends on the concentrations of mucoprotein. The latter increases with increasing purulence owing to the presence of cellular debris. The mucolytic action of N-acetylcysteine is related to repolymerization, in which the disulphide bonds in macro molecules present in mucous are opened.

In addition to the fact that N-acetylcysteine is able to normalize a state of glutathione depletion it can conjugate with different toxic compounds.

As an Antioxidant

Increasing evidence shows that oxidative stress plays a major role in the development of various human diseases. The imbalance between oxidants and antioxidants is caused by an increased number of oxidants and/or deficiencies in the antioxidant system.

All tissues are vulnerable to lesions caused by toxic agents, but due to its location, anatomy and function, the surface epithelium of the lungs is among the most vulnerable. Oxidative stress has been implicated in the pathogenesis of a variety of pulmonary diseases. Reactive oxygen species (ROS) are normally present in the lungs and are essential for life. Simultaneously, there is an extensive network of intra- and extracellular antioxidants. An increased number of ROS and/or (relative) reductions in the antioxidative defence mechanisms may lead to a variety of pathological alterations. Maintaining adequate intracellular levels of glutathione is essential for overcoming the harmful effects of toxic agents. Reduced levels of total glutathione, one of the most important antioxidants in the lungs, in the epithelial lining fluid (ELF) have been found in acute respiratory distress syndrome (ARDS), asymptomatic HIV infection, and interstitial lung diseases like idiopathic

pulmonary fibrosis (IPF), cystic fibrosis, and recipients of lung transplants.

The availability of amino acids for glutathione synthesis is a fundamental factor in its regulation. Cellular amounts of glutamic acid and glycine, but not cysteine, are plentiful. Consequently, glutathione synthesis depends on the availability of cysteine. Glutathione levels may be increased by introducing additional cysteine.

N-acetylcysteine exerts an indirect antioxidant effect related to its role as a glutathione precursor. N-acetylcysteine protects the respiratory epithelium against the aggressive activity of toxic agents by acting as a precursor of glutathione, thereby avoiding pulmonary tissue lesions.

Pharmacokinetics

N-acetylcysteine is rapidly absorbed following an oral dose and is distributed over the entire organism. The highest tissue levels are achieved in the liver, kidney and lungs. N-acetylcysteine is mostly de-acetylated to cysteine in the liver. This will mainly be processed in the amino acid metabolism. Also reversible disulphide compounds are formed with amino acids and proteins with free sulfhydryl groups. Finally, high doses are mostly converted in inorganic sulphate and renally excreted.

Indications

Mucinac 600 is indicated as a mucolytic agent for the adjunctive therapy of respiratory tract disorders characterized by excessive, viscous mucus secretions, such as in bronchitis, emphysema, mucovsicidoses and bronchiectases.

Dosage and Administration

Dosage

One 600 mg oral **MUCINAC 600 Tablets** daily is recommended for adults and adolescents, aged 14 years and older.

Administration

1. Drop the tablet in half glass of water
2. allow the tablet to dissolve completely
3. wait about one and a half minute for water to get clear
4. stir the water and drink immediately

Pediatric Population

Children under 2 years of age

MUCINAC 600 Tablets are contraindicated for use in children under 2 years of age.

Children 2 years of age and older, and adolescents

The safety and efficacy is not established in children aged 2 years and older and adolescents. Other forms and strengths of N-acetylcysteine are more suitable for these patient groups.

Contraindications

- N-acetylcysteine is contraindicated in those patients who are sensitive to it.
- Children under the age of 2 years
- Children and pregnant women with phenylketonuria

Warnings and Precautions

As a Mucolytic Agent

After proper administration of N-acetylcysteine, an increased volume of liquefied bronchial secretions may occur. When cough is inadequate, the airway must be maintained open by mechanical suction, if necessary. Where there is a mechanical block due to a foreign body or local accumulation, the airway should be cleared by endotracheal aspiration, with or without bronchoscopy. Asthmatics under treatment with N-acetylcysteine should be watched carefully. Most patients with bronchospasm are quickly relieved by the use of a bronchodilator. If bronchospasm progresses, the medication should be discontinued immediately.

Bronchospasms may occur with the use of N-acetylcysteine. If bronchospasms occur, the medicinal product should be discontinued immediately.

In very rare cases, the occurrence of serious skin reactions such as Stevens-Johnson syndrome and Lyell's syndrome have been reported when N-acetylcysteine was used in the same time period. In most cases at least one co-suspected drug could be identified, which was more likely the cause of the mucocutaneous syndrome. If new skin or mucosal changes are seen immediate medical advice should be sought and treatment with N-acetylcysteine should be discontinued.

Mainly at the beginning of the treatment with N-acetylcysteine bronchial secretion can become fluid and increase in volume. When a patient is unable to effectively cough up the secretions, postural drainage and bronchoaspiration have to be performed.

Occasionally, severe and persistent vomiting occurs as a symptom of acute acetaminophen overdose. Treatment with oral N-acetylcysteine may aggravate the vomiting. Patients at risk of gastric haemorrhage (e.g., oesophageal varices, peptic ulcers, etc.) should be evaluated concerning the risk of upper gastrointestinal haemorrhage versus the risk of developing hepatic toxicity, and treatment with N-acetylcysteine given accordingly.

In homozygous patients with phenylketonuria the amount of phenylalanine supplied by aspartame in this product should be considered in their dietary prescription.

Pediatric Population

Mucolytics can block the airways of children under the age of 2 due to physiological characteristics of the respiratory system in this age group. The ability to cough up mucus may be limited. Therefore mucolytics should not be used in children younger than 2 years. The safety and efficacy is not established in children aged 2 years and older and in adolescents.

The effervescent tablets should be dissolved fully before intake.

Not fully dissolved tablets present a risk of choking and aspiration, particularly to elderly patients.

Drug Interactions

Simultaneous dissolution of **MUCINAC 600 Tablets** Effervescent Tablets with other medicines is not recommended.

The inactivation of antibiotics by N-acetylcysteine has so far only been reported in *in vitro* tests, in which the relevant substances are directly mixed.

Nevertheless, when oral antibiotics are required it is advisable to take these two hours before or after N-acetylcysteine.

N-acetylcysteine should not be administered concomitantly with antitussive medicinal products.

N-acetylcysteine may increase the vasodilatory effect of nitroglycerin. Caution is advised.

Activated charcoal may decrease the effect of the N-acetylcysteine associated with reduced absorption.

Interaction with Laboratory Tests

N-acetylcysteine may affect the result for colorimetric salicylate determinations.

Pregnancy

N-acetylcysteine effervescent tablets are contraindicated in pregnant women with phenylketonuria due to the aspartame content. There is a limited amount of data on the use of N-acetylcysteine in pregnant women. Animal studies do not indicate reproductive toxicity. N-acetylcysteine passes the placenta. Available data do not indicate a risk for the child. The use of **MUCINAC 600 Tablets** during pregnancy should be considered if necessary.

Lactation

It is not known whether this drug is excreted in human milk. But in therapeutic doses of N-acetylcysteine effervescent tablets no effects on breastfed infants are anticipated. **MUCINAC 600 Tablets** can be used during breastfeeding.

Fertility

Based on available preclinical experience, there are no indications for possible effects of the use of N-acetylcysteine on fertility.

Undesirable Effects

Table 1. mentions all the adverse effects as per the organ class after systemic use of oral.

Table 1: Adverse Effects seen with N-acetylcysteine in Various Clinical Trials

Organ class	**Adverse effect**			
	Uncommon (≥1/1000 to <1/100)	**Rare** (≥1/10.000 to <1/1000)	**Very rare** (<1/10.000)	**Not known**

Immune system Disorders	Hypersensitivity reactions*		Anaphylactic shock, anaphylactic/ anaphylatoid reactions	
Nervous system Disorders	Headache			
Ear and labyrinth Disorders	Tinnitus			
Vascular disease			Haemorrhage	
Gastrointestinal disorders	Stomatitis, abdominal pain, nausea, vomiting, diarrhea	Dyspepsia		
Skin and subcutaneous tissue disorders				Facial edema
General disorders and administration site disorders	Pyrexia			
Investigations	Hypotension			

* Hypersensitivity reactions include bronchospasm, dyspnea, pruritus, urticarial, rash, angioedema and tachycardia.

A decrease in platelet aggregation in the presence of N-acetylcysteine is confirmed in several studies. The clinical significance of this is not yet established.

In patients with peptic ulcer or peptic ulcer history N-acetylcysteine may have an unfavorable effect on the gastric mucosa.

Generally, N-acetylcysteine is well tolerated. However, mild effects such as nausea and vomiting may be observed. Adverse reactions include tinnitus, headache, chills and hemoptysis. Rarely, hypersensitivity reactions like urticaria or bronchospasm may be seen.

If you experience any side-effects, talk to your doctor or pharmacist or write to drugsafety@cipla.com. You can also report side effects directly via the national pharmacovigilance program of India by calling on 1800 180 3024.

By reporting side-effects, you can help provide more information on the safety of this product.

Overdosage

To date no toxic overdose has been reported for the oral pharmaceutical forms of N-acetylcysteine.

Voluntary test subjects are treated for three months with a dose of 11.6 mg N-acetylcysteine per day without observation of any serious side effects.

Oral doses up to 500 mg N-acetylcysteine per kg body weight have been tolerated with no signs of

intoxication.

Symptoms

Overdoses may cause gastrointestinal symptoms such as nausea, vomiting and diarrhea.

Treatment in Case of Overdose

Symptomatic treatment if necessary.

Storage and Handling Instructions

Storage: Store below 25°C

Packaging Information

MUCINAC 600 TABLETS..... Strip of 10 effervescent tablets

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