	Biomedical Limited, **1, Ohimege Road, Industrial Estate, Ga-Imam, Ilorin, Kwara State**		
	Doc No. BML/CES/S004	**Date rev 06/2020**	**Next rev date: 05/2025**

Summary of Product Characteristics

For

Biomedical Cough Expectorant

(Ammonium chloride+Diphenhydramine hydrochloride + Sodium citrate+ Menthol)

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1. NAME OF MEDICINAL PRODUCT

Biomedical Cough Expectorant

2. QUALITATIVE AND QUANTITATIVE DESCRIPTION

Each 5ml of the syrup contains

Ammonium chloride 135mg

Diphenhydramine hydrochloride 14mg Sodium citrate 57mg Menthol 1.1mg

3. PHARMACEUTICAL FORM

A reddish black translucent viscous liquid with raspberry flavour in 100ml amber PET bottle with pilfer proof cap and graduated dose measurement cup to facilitate easy dosing

4. CLINICAL PARTICULARS

4.1 Therapeutic Indications

Biomedical Cough Expectorant is an antitussive and expectorant cough mixture. It is indicated for the relief of cough, sneezing, nasal congestion, nasal discharge, itchy and watery red eyes, hay fever and cold.

4.2 Posology and method of administration

Posology

The safety and efficacy of all active pharmaceutical ingredients used in the formulation of Biomedical cough expectorant has been established in adults and paediatric populations when taken at the prescribed doses

Method of Administration

Age group	**Dose**
1-5yr	2.5ml three times daily
6-12yrs	5ml three times daily
Adults	10ml three times daily

Or as directed by the physician. Note: A maximum of four doses per day should not be exceeded.

4.3 Contraindications

Known hypersensitivity to any ingredient of the product.

4.4 Special warnings and Precautions for Use

Driving and Operation of Machinery

Biomedical Cough Expectorant should not be taken in this case as some of the active ingredients of can cause extreme sedation.

Alcohol

Avoid concomitant use of alcohol with this medication.

4.5 Drug Interactions

Anxiolytics

Concomitant use of Biomedical Cough Expectorant with alcohol, tricyclic antidepressant, opioids, benzodiazepines, anticholinergic and muscle relaxants lead to exaggerated sedation due to the presence of diphenhydramine hydrochloride.

4.6 Pregnancy and Lactation

Pregnancy

There are no known defects with the use of any of the active ingredients of Biomedical Cough Expectorant in pregnancy. Although, there have been insinuations that diphenhydramine causes birth defects when used in the first trimester, but the veracity of the claim is not substantial as the different studies undertaken to establish this claim do not all agree.

Lactation

Biomedical Cough Expectorant would not be expected to cause any adverse effects in breastfed infants. Larger doses or more prolonged use may however cause effects in infants or decrease the milk supply. Mother may need to consider moderate dose after the last feeding of the day to minimize any effects of the drug.

4.7 Effects on ability to drive and use machine

Biomedical Cough Expectorant can cause sedation and it should not be taken if there are plans to operate machine or drive.

4.8 Undesirable effects

There are no serious or deleterious effects with taking Biomedical Cough Expectorant. The observed side effects with the ingredients of Biomedical Cough Expectorant are such that do clear out as the treatment plan ends.

Diphenhydramine hydrochloride

Common side effects include dizziness, sedation, psychomotor impairment, cognitive impairment, dry mouth, blurred vision, constipation, urinary retention, and weight gain. Less commonly, diphenhydramine is associated with agitation and insomnia.

Sodium citrate

Common side effects of Sodium citrate include diarrhoea, nausea, muscle spasms, metabolic acidosis, vomiting, stomach pain and fluid retention

Usually well tolerated, but may cause mild GI disturbances. Rarely, hypersensitivity reactions.

Menthol

Prolonged use of very high doses can lead to symptoms of menthol poisoning, such as rash, wheezing, tightness in the chest, swelling of the mouth, face or throat

4.9 Overdose

Ammonium Chloride

Over dosage of Ammonium Chloride has resulted in a serious degree of metabolic acidosis, disorientation, confusion and coma. Treatment Should metabolic acidosis occur following over dosage, the administration of an alkalinizing solution such as sodium bicarbonate or sodium lactate will serve to correct the acidosis. Over dosage with sodium salts may cause diarrhea, nausea and vomiting, hypernoia, and convulsions.

Diphenhydramine hydrochloride

The toxicities associated with diphenhydramine are dose dependent. Common signs and symptoms of overdose include confusion, urinary retention, tachycardia, blurry vision, dry mouth, irritability and hallucinations. Diphenhydramine induced QRS widening and QTc prolongation can be seen on electrocardiogram. With ingestion greater than 1g, diphenhydramine may result in delirium, psychosis, seizures, coma, and death. There is an even greater risk of seizures, coma, and death when ingestions are greater than 1.5g of diphenhydramine. Fatal deaths have also been reported with oral doses greater than 20mg/kg.

Menthol

Menthol overdose is rare, except taken at extremely large doses. Orally, the lethal dose of Menthol has been estimated as 50-150mg/kg. Chronic exposure to menthol ingestion has been reported to be associated with cutaneous, gastrointestinal and neurological manifestations. Renal dysfunction is common probably because of interstitial nephritis. An excessive amount of menthol is also reported to have caused agitation, dizziness, ataxia, hallucination, convulsion and coma.

5. PHARMACOLOGICAL PROPERTIES

5.1 Pharmacodynamics properties

Pharmacotherapeutic group: Antitussive/expectorant

ATC code:

Mechanism of Action/Pharmacodynamics effects

Ammonium chloride

Ammonium chloride is an effective expectorant due to its irritative action on the bronchial mucosa. This effect causes the production of respiratory tract fluid which in order facilitates the effective cough.

Diphenhydramine hydrochloride

The histamine H1 receptor is located on respiratory smooth muscles. When the H1 receptor is stimulated in the tissues of the respiratory smooth muscles, it causes the stimulation of sensory nerves of airways producing coughing, smooth muscle contraction of bronchi and GIT, and eosinophilic chemotaxis promoting the allergic immune response. Diphenhydramine acts as an inverse agonist at the H1 receptor, thereby reversing the effects of histamine on capillaries, reducing allergic reaction symptoms, including coughing and mucus over secretion in the airways. It has also been demonstrated that diphenhydramine produces an antitussive effect by inhibiting the cough reflex sensitivity in patients with pathological cough.

Sodium citrate

Sodium citrate is a decongestant mucolytic agent which thins and loosens mucus (phlegm), making it easier to cough out.

Menthol

Menthol is a topical agent that acts as a counter-irritant by imparting a cooling effect and by initially stimulating nociceptors and then desensitizing them

5.2 Pharmacokinetics Properties

Ammonium chloride

Ammonium chloride is absorbed from the gastro-intestinal tract. The ammonium ion is converted into urea in the liver, the anion thus liberated into the blood stream and extracellular fluid causes a metabolic acidosis and decreases the pH of the urine; this is followed by transient diuresis.

Diphenhydramine hydrochloride

Oral bioavailability of diphenhydramine is in the range of 40-60%, and peak plasma concentration occurs about 2 to 3 hours after administration. The primary route of metabolism is two successive demethylations of the amine. The resulting primary amine is further oxidized to the carboxylic acid.

The elimination half-life of diphenhydramine has not been fully elucidated but appears to range from between 2.4 to 9.3 hours in healthy adult.

Sodium citrate

Sodium citrate is a weak base. After absorption, it is metabolized to produce bicarbonate, and the generated bicarbonate is neutralized by the hydrogen ions in the blood.

Menthol

Menthol is rapidly absorbed from the small intestine and extracted in the urine predominantly (approximately 65%) as menthol glucuronide.

6. PHARMACEUTICAL PARTICULARS

6.1 List of Excipients

Sucrose, Sodium benzoate, Sorbitol, Sodium carboxyl methyl cellulose, Raspberry flavour, Allura red, Caramel

6.2 Incompatibilities

None

6.3 Shelf life

3 years

6.4 Special Precautions for Storage

Biomedical Cough Expectorant should be stored in a cool dry place at temperatures not more than 30°C

6.5 Nature and Contents of Container

Plain Amber-coloured Polyethylene terephthalates (PET) bottle with ROPP cap placed inside a paperboard carton

6.6 Special Precautions for disposal

Container and/or any unused product should be disposed in accordance with the local requirement

7. MANUFACTURER

BIOMEDICAL LTD
1, Ohimege Road, Industrial Estate
Ilorin Kwara State, PMB 1449