



Duro-Tuss® Linctus for cough

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Introduction

Cough is a protective reflex action that occurs when the airway is obstructed or irritated.¹ Its purpose is to clear the airway so that breathing can continue normally.¹ Coughs can either be described as productive (wet, chesty and producing sputum or phlegm) or non-productive (where no phlegm or sputum is produced).¹ Depending on the cause of a productive cough, patients may wheeze or feel breathless.² A productive cough should be encouraged because it enables the expectoration of secretions from the lower respiratory tract that, if retained, could impair breathing and the ability of the lungs to resist infection.¹ Allergies, irritants or bronchospasm are some of the triggers of a dry or non-productive cough.³

Bronchodilators are central to treating airway disorders.³ By opening up the airways in the lungs, oral bronchodilators help relieve symptoms such as cough, wheezing and shortness of breath.⁴ Beta-2 (β_2) receptor agonists stimulate the β_2 receptors in the muscles lining the airways, causing them to relax and making breathing easier.⁴ Salbutamol is a short-acting β_2 -receptor agonist that acts directly on the smooth muscles of airway walls resulting in rapid bronchodilation.³

Mucolytics, on the other hand, break down sputum produced in the lungs, making it less sticky and reducing its viscosity, making it easier to cough up.⁵ Bromhexine is an example of a mucolytic used to treat respiratory conditions where there is buildup of viscous sputum or phlegm.⁵

Combining salbutamol with a mucolytic such as bromhexine offers an ideal approach to a tight, chesty cough.³

Duro-Tuss® Linctus

Active ingredients

Each 5 ml of Duro-Tuss® Linctus contains 2.41 mg salbutamol sulphate and 4 mg bromhexine hydrochloride.⁶

Indication

Duro-Tuss® Linctus is indicated for the relief of cough associated with bronchospasm (wheezing).⁶

Dosing and administration

Duro-Tuss® Linctus should be dosed every six to eight hours using the 5 ml dosing syringe provided.⁶

The Duro-Tuss® Linctus dose is age-dependent and may be used in patients from two years of age (Table I).⁶

Table I: Dosage information

Children 2–6 years	2.5–5 ml, three to four times a day
Children 6–12 years	5 ml, three to four times a day
Adults	10 ml, three to four times a day

The recommended dose of Duro-Tuss® Linctus should not be exceeded.⁶

Mechanism of action

Salbutamol is a β_2 -selective adrenergic bronchodilator that stimulates the β_2 -adrenergic receptors in the lungs to relax bronchial smooth muscle, thereby relieving bronchospasm.^{3,6,7} It also inhibits the release of bronchoconstrictor mediators from mast cells, and enhances mucociliary clearance and reduces bronchial oedema.³

Bromhexine hydrochloride has been shown to reduce the viscosity of non-infected secretions from mucous cells in the respiratory tract in vitro.⁶ It acts as a secretolytic or mucolytic, making the phlegm less sticky and viscous and easier to expectorate.³

Pharmacokinetics

Salbutamol is readily absorbed from the gastrointestinal tract and is subject to first-pass metabolism in the liver and possibly the gut wall. The onset of action is within 30 minutes, reaching peak effect between two to three hours after the dose. Salbutamol has a duration of action of up to six hours. The plasma half-life is approximately four to six hours.⁶

Bromhexine hydrochloride is well absorbed from the gastrointestinal tract, with peak plasma concentrations occurring after about one hour. Bromhexine undergoes extensive first-pass metabolism in the liver, with a bioavailability of 20%. It has a terminal elimination half-life of 13 to 40 hours.⁶

Salbutamol: bronchodilatory effect and safety summary

- Salbutamol is 29 times more selective for β_2 -receptors than β_1 -receptors giving it higher specificity for pulmonary β -receptors.⁷
- Despite its selectivity, the presence of β_2 -receptors in the heart does not rule out cardiovascular side effects.⁸ However, most cardiac events appear to be of little clinical significance in patients receiving the recommended doses of salbutamol.⁸
- In contrast, the bronchodilator orciprenaline lacks β_2 -selectivity and has been associated with an increased risk of cardiac adverse reactions such as tachycardia and palpitations.⁹
- Unlike the mode of action of β_2 -receptor agonists, the bronchodilatory mechanism of theophylline is not fully understood, but it is thought to block phosphodiesterase, which subsequently relaxes the muscles in the air passages.⁴ Theophylline, however, is a medication with a narrow therapeutic index and doses must be titrated carefully, and strict monitoring is usually required.¹⁰
- A study comparing salbutamol to theophylline in wheezing infants demonstrated comparable bronchodilatory efficacy between the two. However, salbutamol was found to be better tolerated, associated with a lower combined incidence of restlessness, tremor and tachycardia in the salbutamol group (20%) than in the theophylline group (31.6%).¹¹
- Due to the pharmacology of salbutamol and the presence of β_2 -receptors in the heart, the recommended dosage of salbutamol should not be exceeded.^{6,7,12}

To ensure the recommended dose of Duro-Tuss® Linctus is not exceeded, the 5 ml dose syringe included in the package should be used. Drinking directly from the bottle ("swigging") should be discouraged as the average 'swig' is between 14 to 25 ml, which can be up to three times the recommended dose.¹³⁻¹⁵

Duro-Tuss® Linctus safety

Contraindications

Duro-Tuss® Linctus is contraindicated in patients:⁶

- with known hypersensitivity to salbutamol, bromhexine or any other ingredients in Duro-Tuss® Linctus.
- with cardiac dysrhythmias or tachycardia.
- receiving monoamine oxidase inhibitors (MAOIs) or within 14 days of MAOIs termination.

Precautions

Salbutamol sulphate

- Use with caution in hyperthyroidism, myocardial insufficiency, susceptibility to QT-interval prolongation, hypertension, diabetes mellitus, and severe asthma.⁶
- Plasma-potassium concentrations should be monitored in severe asthma as hypokalaemia may occur. The risk can be potentiated by hypoxia and acidosis or the concomitant use with other medicines that cause hypokalaemia or cardiac dysrhythmias.⁶
- High doses may increase the risk of severe side effects, including cardiac dysrhythmias. Therefore, the maximum dose should not be exceeded.⁶

Bromhexine hydrochloride

- Use with care in patients with a history of peptic ulceration.⁶
- Care is also advisable in asthmatic patients.⁶
- Clearance of bromhexine or its metabolites may be reduced in patients with severe hepatic or renal impairment.⁶

Drug interactions

Concomitant administration of Duro-Tuss® Linctus with sympathomimetics, diuretics, corticosteroids or xanthines, e.g. theophylline, increases the risk of hypokalaemia.⁶

Side effects

Salbutamol is generally well-tolerated, while bromhexine is associated with a low level of toxicity.³ Fine tremor, tachycardia and palpitations associated with salbutamol are usually dose-related.¹⁶ Please refer to the prescribing information of Duro-Tuss® Linctus for a complete list of side effects.

Conclusion

Oral bronchodilators such as β_2 -receptor agonists help relieve symptoms such as cough, wheezing and shortness of breath.⁴ Combining salbutamol (a short-acting β_2 -receptor agonist) with bromhexine (a mucolytic), such as that provided in Duro-Tuss® Linctus, offers an ideal solution to effectively manage a tight, chesty cough.^{3,6}

References

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