A Review on Newly Invented Drug Rapiblyk: Used for treatment of Supraventricular Tachycardia

ABSTRACT: Rapiblyk it may contain landiolol is mainly prescribed for the treatmnent for short-term management of supraventricular tachycardia that are including atrial fibrillation and atrial flutter to lowers the ventricular rate. Rapiblyk is approved by 22November 2024 by FDA. They are available dosage form in the Lyophilized powder for injection use and manufacture is AOP Orphan Pharmaceuticals GmbH. Rapiblyk molecular formula is $C^{25}H^{39}N^{3}O^{8}$ and Molecular weight is 509.6 g/mol. The most frequently reported side effect of Rapiblyk is low blood pressure. Rapiblyk drug get contain Active Ingredient is Landiolol and Inactive Ingredients is Mannitol and sodium hydroxide used for pH adjustment. Keep unreconstituted or new vials stored at a temperature of 20°C to 25°C.

KEYWORDS: Rapiblyk, Landiolol, Supraventricular Tachycardia, Lower the Ventricular Rate

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INTRODUCTION:-

Rapiblyk Contain landiolol is prescribed for short-term management of supraventricular tachycardia, including atrial fibrillation and atrial flutter, to lower the ventricular rate. This fast-acting beta-adrenergic blocker is designed to reduce heart rate (negative chronotropic effect) while having a minimal effect on blood pressure. It is delivered as an intravenous infusion under medical supervision. (2)

As a selective beta-1-adrenoreceptor antagonist, Rapiblyk acts by targeting beta-1 receptors primarily located in the heart. This action blocks the effects of epinephrine and norepinephrine, which normally increase heart rate, resulting in a slower and more controlled heart rhythm.(2)

FDA Approval: Yes (initially approved on November 22, 2024) based on favourable clinical trial results.

- **Brand Name:** Rapiblyk
- **Generic Name:** Landiolol
- **Dosage Form:** Lyophilized powder for injection
- **Manufacturer:** AOP Orphan Pharmaceuticals GmbH
- **Indication/ Treatment :** Treatment of supraventricular tachycardia (3)
- **Molecular Formula:** C25H39N3O8
- **Molecular Weight:** 509.6 g/mol (4)

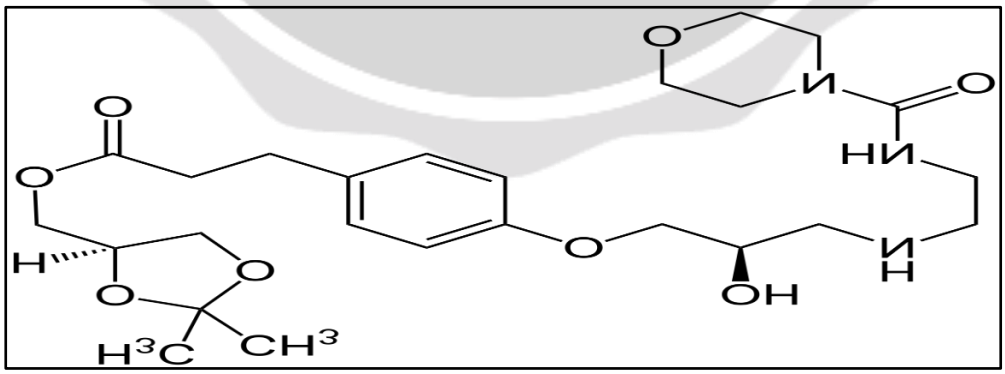

Fig.01 Structure of Landiolol (5)

Recommended Dosage (1)

RAPIBLYK is administered as a continuous intravenous infusion, with dosage adjustments made as needed to manage heart rate. Data on its use beyond 24 hours are limited.

Table.01 Recommended Dosage and Dose Interval

Dose Intervals	Normal cardiac function	Impaired cardiac function
Starting dose	9 mcg/kg/min	1 mcg/kg/min
Titration interval	10 min	15 min
Titration step	9 mcg/kg/min	1 mcg/kg/min
Maximum dose	36 mcg/kg/min	36 mcg/kg/min

A dosage of 9 mcg/kg/min of landiolol corresponds to 9.6 mcg/kg/min of landiolol hydrochloride. (1)

Side effects of Rapiblyk:

The most frequently reported side effect of Rapiblyk is low blood pressure (hypotension), occurring most of the patients in those whose receiving a placebo, as observed in the placebo-controlled clinical trials.(2)

Warnings and precautions:

Risk of Low Blood Pressure (Hypotension), Bradycardia, and Heart Failure: Patients receiving Rapiblyk will be closely monitored for any signs of cardiovascular side effects. If adverse effects occur, the dosage may be adjusted or the medication discontinued and advice from the physicians. (2)

Risk of Respiratory Complications:

Caution is advised for patients with reactive airway diseases, as beta-blockers are generally not recommended for this group. Due to Rapiblyk selective beta-1 activity, the dose can be carefully adjusted to the lowest effective level. If bronchospasm develops, the infusion must be stopped immediately and a beta-2 agonist may be administered with careful monitoring of ventricular rates. (2)

Diabetes and Hypoglycaemia: Rapiblyk may mask symptoms of low blood sugar and influence blood glucose levels, requiring close monitoring in diabetic patients. (2)

Abrupt Discontinuation: Sudden cessation of beta-blocker therapy can lead to severe angina exacerbation, heart attack, or ventricular arrhythmias, especially in patients with coronary artery disease. Patients should be monitored for signs of myocardial ischemia during withdrawal of the medication. (2)

Rapiblyk is not recommended for use in patients with the following conditions: (2)

- Severe sinus bradycardia, sick sinus syndrome, or heart block beyond the first degree
- Decompensated heart failure
- Cardiogenic shock, as it can exacerbate cardiovascular collapse and potentially lead to cardiac arrest
- Pulmonary hypertension, due to the risk of cardiorespiratory instability
- Known allergy to landiolol or any of its inactive components

Before starting this medication, inform your healthcare provider if you: (2)

- Have liver impairment
- Are pregnant or planning to become pregnant
- Are breastfeeding or intend to breastfeed
- Rapiblyk is given as a continuous intravenous infusion, with the dosage adjusted as necessary to manage heart rate. Its use is generally limited to 24 hours due to limited data on longer durations.

Preparation Instruction

Rapiblyk is provided in a single-dose vial containing 280 mg of landiolol (equivalent to 300 mg of landiolol hydrochloride). Reconstitute the vial with 50 mL of 0.9% Sodium Chloride Injection, USP, or 5% Dextrose Injection, USP. Gently swirl the vial to fully dissolve its contents. (2)

Storage Instructions (2)
Keep unreconstituted or new vials stored at a temperature of 20°C to 25°C (68°F to 77°F). Short-term temperature fluctuations between 15°C and 30°C (59°F to 86°F) are allowed.

Ingredients (2)

- **Active Ingredient:** Landiolol
- **Inactive Ingredients:** Mannitol and sodium hydroxide (used for pH adjustment)

Company (2)

Rapiblyk AOP Orphan Pharmaceuticals GmbH Leopold-Ungar-Platz 2 1190 Vienna Austria.

Administration (1)
After reconstitution, the solution contains 280 mg of landiolol in 50 mL, resulting in a concentration of 5.6 mg/mL.

The infusion rate can be determined using the formula:
Infusion rate (mL/hour) = target dose (mcg/kg/min) × body weight (kg) ÷ 93

Dosage Forms and Strengths
Injection: A white to nearly white lyophilized powder provided in a single-dose vial, containing 280 mg of landiolol (equivalent to 300 mg of landiolol hydrochloride).

CONTRAINDICATIONS / RAPIBLYK should not be used in patients with:

- Severe sinus bradycardia, sick sinus syndrome, or heart block beyond the first degree refer to Warnings and Precautions.
- Decompensated heart failure [refer to Warnings and Precautions.
- Cardiogenic shock, as it can lead to further cardiovascular collapse and potentially result in cardiac arrest
- Pulmonary hypertension, due to the risk of cardiorespiratory instability
- Known hypersensitivity, including anaphylactic reactions, to landiolol or any of its inactive components.

Warnings and Precautions (1)

1 Hypotension
Patients with hemodynamic instability, hypovolemia, or on medications that interact with RAPIBLYK have an elevated risk of hypotension. Blood pressure should be monitored closely, especially if baseline blood pressure is low. If hypotension occurs, reduce or discontinue RAPIBLYK. Blood pressure is expected to return to normal within 30 minutes after stopping the medication.

2 Cardiac Failure
Beta-blockers, including RAPIBLYK, can reduce myocardial contractility, potentially leading to heart failure or cardiogenic shock. At the first sign of cardiac failure, discontinue RAPIBLYK and initiate supportive care.

3 Bradycardia
Patients with conditions like first-degree atrioventricular block, sinus node dysfunction, or conduction disorders are at greater risk of developing bradycardia, including sinus pause, heart block, severe bradycardia, or cardiac arrest. Monitor heart rate and rhythm during RAPIBLYK administration. If bradyarrhythmia occurs, reduce the dose or discontinue the medication.

4 Reactive Airways Disease
Beta-blockers are generally not recommended for patients with reactive airway diseases. However, due to RAPIBLYK's selective beta-1 activity and adjustable dosing, it may be used at the lowest effective dose. If

bronchospasm develops, immediately stop the infusion and consider administering a beta-2 agonist with careful monitoring of ventricular rates.

5 Infusion Site Reactions
Reactions such as pain, swelling, and redness may occur at the infusion site. Avoid using small veins or butterfly catheters. If a reaction develops, switch to an alternative infusion site and prevent extravasation.

6 Diabetes Mellitus and Hypoglycemia
Beta-blockers may mask early symptoms of hypoglycemia, such as tachycardia, and increase the risk of severe or prolonged hypoglycemia, especially in diabetic patients, fasting individuals (e.g., during surgery or vomiting), or children. Monitor for hypoglycaemia in patients on RAPIBLYK.

7 Prinzmetal's Angina
Beta-blockers may worsen angina in patients with Prinzmetal's angina due to unopposed alpha receptor-mediated coronary vasoconstriction.

8 Pheochromocytoma
In patients with pheochromocytoma, use RAPIBLYK only alongside an alpha-blocker, administered first. Using beta-blockers alone in this setting can cause a paradoxical increase in blood pressure due to reduced beta receptor-mediated vasodilation in skeletal muscles.

9 Hyperkalemia
Beta-blockers, including RAPIBLYK, can elevate serum potassium levels, increasing the risk of hyperkalaemia, particularly in patients with renal impairment. Intravenous beta-blockers have been linked to life-threatening hyperkalaemia in haemodialysis patients. Monitor electrolytes during therapy.

10 Peripheral Circulatory Disorders
RAPIBLYK may aggravate conditions like Raynaud's disease, Raynaud's syndrome, or peripheral vascular disease.

11 Abrupt Discontinuation
Sudden withdrawal of RAPIBLYK can lead to severe angina, myocardial infarction, or ventricular arrhythmias in patients with coronary artery disease. Monitor for signs of myocardial ischemia during discontinuation.

12 Metabolic Acidosis
Beta-blockers have been associated with hyperkalemic renal tubular acidosis. Acidosis may also reduce cardiac contractility.

13 Hyperthyroidism
Beta-blockers can mask symptoms of hyperthyroidism, such as tachycardia. Abrupt discontinuation of beta-blockers may trigger a thyroid storm. Monitor for signs of thyrotoxicosis when stopping therapy.

14 Severe Hypersensitivity Reactions
Beta-blockers may heighten the risk of severe anaphylactic reactions in patients with a predisposition to such allergies, increasing sensitivity to allergens from accidental, diagnostic, or therapeutic exposure.

References:-

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