**Dosage and Administration**

**Adults:**
Glormin may be administered without regards to meals.

Hypertension: The recommended daily dose is 50 mg. This dose may be increased to 100 mg/day. Effective control will be established after one or two weeks of therapy.

Angina: The recommended daily dose is 100 mg in 1 or 2 doses.

Arrhythmias: The recommended daily dose is 50-100 mg, given as a single dose.

Myocardial Infarction: Following early intervention by intravenous injection, Glormin 50 mg orally about 15 minutes following intravenous injection, then 50 mg after 12 hours, and then later by 100 mg orally to be given once daily, for 6-9 days post myocardial infarction.

For patients who present some days after suffering an acute myocardial infarction, Glormin 100 mg daily is recommended for long-term prophylaxis of myocardial infarction.

**Children:**
Glormin is not recommended for use in children.

**Elderly:**
Dosage reduction may be necessary, especially in patients with impaired renal function.

**Dosage in Renal Failure**
Glormin is mainly excreted unchanged in urine, therefore, dosage adjustment is required in cases of severe renal function impairment.

Mild impairment (Creatinine clearance >35 ml/min): No change in dosage.

Moderate impairment (Creatinine clearance 15-35 ml/min): The recommended dose is 50 mg daily.

Severe impairment (Creatinine clearance <15 ml/min): The recommended dose is 25 mg daily or 50 mg every other day.

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**Atenolol**

**Composition**
Glormin Tablets 100 mg: Each tablet contains Atenolol 100 mg.
Glormin Tablets 50 mg: Each tablet contains Atenolol 50 mg.
Glormin Tablets 25 mg: Each tablet contains Atenolol 25 mg.

**Properties**
Atenolol is a selective beta-1 blocker i.e. it acts preferentially on beta-1 adrenergic receptors in the heart. As with other beta-blockers, the mode of action of atenolol in the treatment of hypertension is unclear. It is probably the action of atenolol in reducing cardiac rate and contractility, which makes it effective in eliminating or reducing the symptoms of patients with angina.

**Pharmacokinetics**
Following oral administration approximately 40-50% of the dose reaches the systemic circulation with peak plasma concentration occurring 2-4 hours after dosing. Atenolol penetrates tissues poorly due to its low lipid solubility and its concentration in the brain is low. Plasma protein binding is low (approximately 3%). The plasma half-life is about 6 hours but it may increase in severe renal impairment since the kidney is the major route of elimination.

Glormin is effective for at least 24 hours after a single oral daily dose. This simplicity of dosing improves compliance by its acceptability to patients.

**Indications**
Glormin is indicated for:
Hypertension.
Angina pectoris.
Cardiac arrhythmias.
Myocardial infarction (Early and late intervention).
**Contraindications**
As with other beta-blockers, Glormin should not be used in patients with asthma or history of obstructive airways disease, pulmonary edema, uncontrolled heart failure, Prinzmetal’s angina, marked bradycardia, hypotension, sinus node dysfunction, second- or third degree AV block, cardiogenic shock, metabolic acidosis, severe peripheral arterial disease, and untreated phaeochromocytoma.

**Precautions**
Glormin should be given with caution to patients with first-degree AV block. Glormin should not be discontinued abruptly in patients suffering from angina. It may increase sensitivity to allergens and result in more severe reaction to a variety of allergens and may also reduce response to the usual doses of adrenaline used to treat the allergic reactions.

Should also be given with caution to patients with renal failure, diabetes, myasthenia gravis and those with history of hypersensitivity to atenolol.

**Use in Pregnancy and Lactation**
Administration of atenolol to pregnant women in the management of mild to moderate hypertension, has been associated with intra-uterine growth restriction, neonatal hypoglycaemia and bradycardia and the risk is greater in severe hypertension. Thus, utmost caution must be exercised and the use of Glormin in women who are, or may become pregnant requires that the anticipated benefit be weighed against the possible risks, particularly in the first and second trimesters. Atenolol is excreted in significant amounts in breast milk; thus caution should be exercised when Glormin is administered to nursing women.

**Side effects**
Glormin is well tolerated as with all medicines atenolol can cause unwanted side effects, the following have been reported:

- bradycardia; heart failure deterioration; postural hypotension which may be associated with syncope; cold extremities. In susceptible patients: precipitation of heart block; intermittent claudication; Raynaud’s phenomenon.

- confusion; dizziness; headache; mood changes; nightmares; psychoses and hallucinations; sleep disturbances of the type noted with other beta-blockers.

- dry mouth; gastrointestinal disturbances. Elevations of transaminase levels have been seen infrequently; rare cases of hepatic toxicity, including intrahepatic cholestasis have been reported.

- purpura; thrombocytopenia.

- alopecia; dry eyes; psoriasiform skin reactions; exacerbation of psoriasis; skin rashes.

- paraesthesia, sexual impotence

- bronchospasm may occur in patients with bronchial asthma or a history of asthmatic complaints.

- Visual disturbances, hypersensitivity reactions, including angioedema and urticaria; fatigue.

The patient should consult the physician incase of the experience of the above-mentioned side effects or any other unusual side effects.

**Drug Interactions**
Combined use of beta-blockers and calcium channel blockers may lead to bradycardia and AV block, severe hypotension and heart failure.

Combined use with cardiac glycosides may increase AV block and bradycardia.

Beta-blockers may exacerbate the rebound hypertension, which can follow the withdrawal of clonidine.

If the two drugs are co-administered, the beta-blocker should be withdrawn several days before discontinuing clonidine. If replacing clonidine by beta-blocker therapy, the introduction of beta-blocker should be delayed for several days after clonidine administration has stopped.

Combined use with antiarrhythmics may increase risk of myocardial depression, bradycardia and AV block.

Concomitant use of sympathomimetic agents, e.g. adrenaline, may counteract the effect of beta-blockers.

Concomitant use of NSAIDs may decrease the hypotensive effects of beta-blockers.

Concomitant use of antidiabetics may enhance hypoglycaemic effect.
Concomitant use of diuretics may enhance hypotensive effect.
Use of anaesthetics with beta-blockers may lead to enhanced hypotensive effect.
Use of anxiolytics and hypnotics may enhance the hypotensive effect of beta-blockers.
Theophylline and beta-blockers should be avoided on pharmacological grounds (bronchospasm).

**Overdosage**
The symptoms of overdosage may include bradycardia, hypotension, acute cardiac insufficiency and bronchospasm.
General treatment should include: close supervision, treatment in an intensive care ward, the use of gastric lavage, activated charcoal and a laxative to prevent absorption of any drug still present in the gastrointestinal tract, the use of plasma or plasma substitutes to treat hypotension and shock. The use of haemodialysis or haemoperfusion may be considered.
Excessive bradycardia can be countered with atropine 1-2 mg intravenously and/or a cardiac pacemaker. If necessary, this may be followed by a bolus dose of glucagon 10 mg intravenously. If required, this may be repeated or followed by an intravenous infusion of glucagon 1-10 mg/hour depending on response. If no response to glucagon occurs or if glucagon is unavailable, a beta-adrenoceptor stimulant such as dobutamine 2.5 to 10 micrograms/kg/minute by intravenous infusion may be given. Dobutamine, because of its positive inotropic effect could also be used to treat hypotension and acute cardiac insufficiency. It is likely that these doses would be inadequate to reverse the cardiac effects of beta-blocker blockade if a large overdose has been taken. The dose of dobutamine should therefore be increased if necessary to achieve the required response according to the clinical condition of the patient.
Bronchospasm can usually be reversed by bronchodilators.

**Presentation**
Glormin 100 mg Tablets in packs of 28 and 504 tablets.
Glormin 50 mg Tablets in packs of 28 and 504 tablets.
Glormin 25 mg Tablets in packs of 28 and 504 tablets.
Store below 25°C in dry place. Protect from light.