4.12: Beta-1 Antagonists

Metoprolol is a selective Beta-1 antagonist.

**Mechanism of Action:** Metoprolol primarily blocks Beta-1 receptors in the heart, causing decreased heart rate and decreased blood pressure. However, higher doses can also block Beta-2 receptors in the lungs, causing bronchoconstriction.

**Indications:** Metoprolol is commonly used to treat high blood pressure, chest pain due to poor blood flow to the heart, as an early intervention during a myocardial infarction (MI), and in several heart conditions involving an abnormally fast heart rate.

**Nursing Considerations:** Don’t crush extended-release (ER) formulations. Always check patient’s apical pulse rate before giving drug. Withhold the drug and call the prescriber immediately if the heart rate is slower than 60 beats/minute, unless other parameters are provided. In diabetic patients, monitor glucose level closely because the drug masks common signs and symptoms of hypoglycemia. The most serious potential adverse effects are shortness of breath, bradycardia, and worsening heart failure. Other adverse effects include fatigue, dizziness, depression, insomnia, nightmares, gastrointestinal upset, erectile dysfunction, dyspnea, and wheezing.

**Black Box Warning:** When stopping therapy, the dosage should be tapered over 1 to 2 weeks because abrupt discontinuation may cause chest pain or myocardial infarction (MI).

**Patient Teaching & Education:** Patients should be instructed to take the medication as prescribed. They should be advised that abrupt cessation of medication therapy may result in life-threatening cardiac arrhythmias. Patients should also be taught how to self-check pulse and blood pressure to assess the effectiveness of medication therapy. Additionally, they should be cautioned against sudden changes in position due to orthostatic blood pressure changes. Patients may experience increase sensitivity to cold and should be cautioned to avoid caffeinated substances.[1]
Now let’s take a closer look at the medication grid on metoprolol in Table 4.12. [2]

Table 4:12 Metoprolol Medication Grid

<table>
<thead>
<tr>
<th>Class/Subclass</th>
<th>Prototype/Generic</th>
<th>Administration Considerations</th>
<th>Therapeutic Effects</th>
<th>Side/Adverse Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beta-1 antagonist</td>
<td>Selective B blocker: metoprolol</td>
<td>Do not crush extended-release (ER) formulations. Always assess apical HR and if less than 60, do not administer and call the prescriber unless other parameters are provided. Monitor blood sugar in diabetic patients because drug can mask symptoms of hypoglycemia.</td>
<td>Decreases blood pressure or controls rapid heart rate.</td>
<td>Most serious: - Hypotension - Bradycardia - Worsening heart failure (HF) Other: - CNS: fatigue, dizziness, depression, insomnia, nightmares - GI upset - GU: erectile dysfunction - Respiratory: dyspnea and wheezing</td>
</tr>
</tbody>
</table>

1. uCentral from Unbound Medicine. https://www.unboundmedicine.com/ucentral
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