What is the best beta-blocker for systolic heart failure?

**EVIDENCE-BASED ANSWER**

**A**

Three beta-blockers—carvedilol, metoprolol succinate, and bisoprolol—reduce mortality equally (by about 30% over one year) in patients with Class III or IV systolic heart failure.

Evidence summary

A 2013 network meta-analysis compared beta-blockers with placebo or standard treatment by analyzing 21 randomized trials with a total of 23,122 patients. Investigators found that beta-blockers as a class significantly reduced mortality after a median of 12 months (odds ratio=0.71, 95% confidence interval [CI], 0.64-0.80; number needed to treat [NNT]=23).

They also compared atenolol, bisoprolol, bucindolol, carvedilol, metoprolol, and nebivolol with each other and found no significant difference in risk of death, sudden cardiac death, death resulting from pump failure, or tolerability.

Three drugs are more effective and tolerable than others

A 2013 stratified subset meta-analysis used data from landmark randomized controlled trials (RCTs) that evaluated beta-blockers vs placebo in patients with systolic heart failure to compare metoprolol succinate (MERIT-HF) vs placebo with bisoprolol (CIBIS-II), carvedilol (COPERNICUS), and nebivolol (SENIORS-SHF) vs placebo (TABLE). Three of the drugs—bisoprolol, carvedilol, and metoprolol succinate—showed similar reductions relative to placebo in all-cause mortality, hospitalization for heart failure, and tolerability. Investigators concluded that the 3 drugs have comparable efficacy and tolerability, whereas nebivolol is less effective and tolerable.

Carvedilol vs beta-1-selective beta-blockers

Another 2013 meta-analysis of 8 RCTs with 4563 adult patients 18 years or older with systolic heart failure compared carvedilol with the beta-1-selective beta-blockers atenolol, bisoprolol, nebivolol, and metoprolol. Investigators found that carvedilol significantly reduced all-cause mortality (relative risk=0.85; 95% CI, 0.78-0.93; NNT=23) compared with beta-1-selective beta-blockers.

However, 4 trials (including COMET, N=3029) compared carvedilol with short-acting metoprolol tartrate, which may have skewed results in favor of carvedilol. Moreover, 2 trials comparing carvedilol with bisoprolol and 2 trials comparing carvedilol with nebivolol found no significant difference in all-cause mortality.

Recommendations

The 2010 Heart Failure Society of America Comprehensive Heart Failure Practice Guideline notes that the marked beneficial effects of beta blockade with carvedilol, bisoprolol, and controlled- or extended-release metoprolol have been well-demonstrated.
Carvedilol, metoprolol succinate, and bisoprolol all reduce mortality by about 30% over one year in patients with Class III or IV systolic heart failure.

References

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