High-priced drugs used to treat diabetic macular edema not cost-effective

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The anti-vascular endothelial growth factor drugs ranibizumab and aflibercept, used to treat vision loss from diabetic macular edema (DME), and approximately 20 to 30 times more expensive than bevacizumab, are not cost-effective for treatment of DME compared to bevacizumab unless their prices decrease substantially, according to a study published online by *JAMA Ophthalmology*.

Anti-vascular endothelial growth factor (VEGF) medicines have revolutionized DME treatment. A recent randomized clinical trial comparing anti-VEGF agents for patients with decreased vision from DME found that at 1 year aflibercept (2.0 mg) achieved better visual outcomes than repackaged (compounded) bevacizumab (1.25 mg) or ranibizumab (0.3 mg); the worse the starting vision, the greater the treatment benefit with aflibercept.

These agents also vary substantially in cost. On the basis of 2015 costs, aflibercept was $1,850, ranibizumab, $1,170, and repackaged (compounded) bevacizumab, approximately $60 per dose. Considering that these medicines may be given 9 to 11 times in the first year of treatment and, on average, 17 times during 5 years, total costs can be substantial. In 2010, when these intravitreous agents were being used predominantly for age-related macular degeneration, ophthalmologic use of VEGF therapy cost approximately $2 billion or one-sixth of the entire Medicare Part B drug budget. In 2013, Medicare Part B expenditures for aflibercept and ranibizumab alone totaled $2.5 billion.

Adam R. Glassman, M.S., of the Jaeb Center for Health Research, Tampa, Fla., and colleagues examined the incremental cost-effectiveness ratios (ICERs) of aflibercept, bevacizumab, and ranibizumab for the treatment of DME with an analysis of efficacy, safety, and resource utilization data at 1-year follow-up from the Diabetic Retinopathy Clinical Research (DRCR) Network Comparative Effectiveness Trial. The researchers determined the ICERs for all trial participants and subgroups with baseline vision of approximate Snellen (an eye chart) equivalent 20/32 to 20/40 (better vision) and baseline vision of approximate Snellen equivalent 20/50 or worse (worse vision). One-year trial data were used to calculate cost-effectiveness for 1 year for the 3 anti-VEGF agents; mathematical modeling was then used to project 10-year cost-effectiveness results.

The study included 624 participants; 209 in the aflibercept group, 207 in the bevacizumab group, and 208 in the ranibizumab group. The researchers found that in eyes with visual acuities (VAs) of 20/50 or worse because of DME, aflibercept produced greater average VA gains compared with bevacizumab or ranibizumab. The analysis suggested that the VA benefits of aflibercept translate into modest quality-of-life improvements but at a high cost relative to bevacizumab, with the ICERs substantially higher than thresholds per quality-adjusted life-year (QALY) frequently cited in cost-effectiveness literature and U.S. guidelines. The authors add that it is unlikely that any realistic differences in VA achieved with the 3 agents during years 2 to 10 (in the range of changes seen in prior studies) would alter their relative cost-effectiveness.

In eyes with decreased vision from DME, treatment costs of aflibercept and ranibizumab would need to decrease by 69 percent and 80 percent, respectively, to reach a cost-effectiveness threshold of $100,000 per QALY compared with bevacizumab during a 10-year horizon.

"From a societal perspective, bevacizumab as first-line therapy for DME would confer the greatest value, along with substantial cost savings vs the other agents. These results highlight the challenges that physicians, patients, and policymakers face when safety and efficacy results are at odds with cost-effectiveness results," the researchers write.

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