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Proactive vs. Reactive Therapeutic Drug Monitoring of Infliximab in Crohn's Disease

Dr. Abdussalam:
For ReachMD, this is Audio Abstracts, produced in collaboration with the Crohn's & Colitis Foundation. I'm Dr. Abdullah Abdussalam, gastroenterologist with CHI Health/Creighton University. I'm also a member of the Crohn's & Colitis Foundation's Rising Educators, Academics, and Clinicians Helping IBD group, or REACH–IBD. Today, I'll be reviewing an article published in the Inflammatory Bowel Diseases journal titled "Proactive Versus Reactive Therapeutic Drug Monitoring of Infliximab in Crohn's Disease: A Cost-Effectiveness Analysis in a Simulated Cohort."

Although infliximab is widely used in the treatment of Crohn's Disease, 50 percent of patients eventually lose response to it. So to compare proactive therapeutic drug monitoring to reactive therapeutic monitoring and the cost effectiveness of each dosing strategy, the authors used a stochastic simulation model of 100,000 patients with Crohn's Disease being treated with infliximab. Notably, the model assumed patients were on infliximab monotherapy.

The model tracked antibody levels, drug levels, flares, and changes in therapy over a 5-year period.

To achieve a representative simulation reflecting the population from the TAXIT trial, initial infliximab concentrations were set as 15 percent undetectable, 33 percent low concentrations, 29 percent therapeutic levels, and 23 percent high concentrations.

To account for true societal costs, 40 percent of the average wholesale price of biologics was used, and medical costs were based on the CMS physician fee schedule.

In the proactive monitoring simulation, infliximab concentration and antibody levels were measured every 6 months. Low concentrations were dose-escalated by 2.5 mg/kg up to a max of 10 mg/kg. Those with asymptomatic high antibody levels and undetected drug concentrations were transitioned to adalimumab.

The reactive drug monitoring group only had levels checked in the event of a flare. The control group never had levels checked, and dose-escalation decisions were made based on symptoms.

In each group, when a patient was switched from infliximab, they entered into a separate Markov cohort model for the duration of the study. In this model, costs were monitored as patients went through therapy with other biologics and potentially surgery.

Based on this approach, the study found that the proactive therapeutic drug monitoring strategy led to fewer flares of Crohn's Disease than the reactive strategy. Proactive drug monitoring was also found to be marginally cost-effective compared to reactive monitoring as it yielded an incremental cost-effectiveness ratio of $146,494 per quality-adjusted life year

Factors that affect cost-effectiveness include risk of disease flares, cost of biologics, and cost of drug monitoring. In particular, the study found that as the cost of the drug or the cost of testing goes down, then the cost effectiveness of proactive monitoring improves Conversely, rising costs of biologics or drug monitoring decreases cost-effectiveness of a proactive therapeutic drug monitoring strategy.

Also affecting cost effectiveness is flare rate. A low flare rate in spite of low drug levels makes proactive drug-monitoring less cost effective.

It's important to note, however, that the results of this simulation modeling study are sensitive to model inputs and assumptions. Another limitation of the study is the use of only infliximab monotherapy in the model; it is unclear how the use of combination therapy would affect these results.

If you're interested in this topic or others on Crohn's disease or ulcerative colitis, the Inflammatory Bowel Diseases Journal, which is the official journal of the Crohn's & Colitis Foundation that supports the Foundation's mission, provides the most impactful and cutting-edge clinical topics and research findings related to inflammatory bowel diseases to clinicians and researchers. For more information on the Foundation, please visit crohnscolitisfoundation.org.

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