Cell-Free DNA Epigenomic-Based Test Is Predicted to Be Cost-Effective to Manage New-Onset Type 2 Diabetes Patients for Risk of Pancreatic Cancer

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OBJECTIVES: This study aims to assess the clinical and economic benefits of early detection of pancreatic cancer (PC) in patients with new-onset type 3c diabetes (NOD) using a blood-based, cell-free DNA epigenomic test (Avantect; ClearNote Health, CA). Recent findings indicate that NOD increases the risk of PC by 6-8 times within the first three years post-diagnosis.

METHODS: A Markov model was created to compare two strategies: no screening and screening higher-risk NOD patients using a blood-based cell-free DNA epigenomic test. Using criteria from Sharma et al. (Gastroenterology 2018), approximately 20% of the NOD patients were considered at higher risk for PC. The risk for developing PC, survival, and cost data were obtained from the US Surveillance, Epidemiology, and End Results (SEER), and Medicare databases.

RESULTS: The cell-free DNA epigenomic test proves cost-effective in NOD high-risk patients, with an Incremental Cost-Effectiveness Ratio (ICER) of $5,173 and a Willingness to Pay of $100,000.

The model predicts that in a cohort of 10,000 patients with NOD, 1% would be diagnosed with PC in the no-screening strategy, with only 7.1% of cases treatable with surgery. In contrast, 71 PC cases are predicted to be detected with cfDNA testing. These cases would be more likely to be detected at an earlier, more treatable stage, with 32.4% eligible for surgical resection.

The clinical benefit of using the blood test in NOD vs. no screening is reflected in an IQALE of 0.02485.

CONCLUSIONS: Testing higher-risk patients with NOD for pancreatic cancer using a blood-based cell-free DNA epigenomic test is predicted to be cost-effective compared to the standard of care (no testing). Initiating this test within three years of a diabetes diagnosis likely increases the detection of treatable pancreatic cancer cases, thereby potentially improving patient survival outcomes.