

Abstract

Background & Aims: Current guidelines recommend long-term image-based surveillance for patients with low-risk intraductal papillary mucinous neoplasms (IPMNs). This simulation study aimed to examine the comparative cost-effectiveness of continued vs. discontinued surveillance after various ages and define the optimal age to stop the surveillance.

Methods: We constructed the Markov model with a lifetime horizon to simulate the clinical course of IPMN patients receiving magnetic resonance imaging-based surveillance. We calculated incremental cost-effectiveness ratios (ICERs) for continued vs. discontinued surveillance after various ages stratified by sex and the diameter of the main pancreatic duct (MPD). We determined the optimal age to stop the surveillance as the lowest age at which the ICER exceeded the willingness-to-pay threshold of \$100,000 per quality-adjusted life year. To estimate model parameters, we utilized a clinical cohort of IPMN patients and a national database including pancreatic cancer patients receiving pancreatectomy as well as the published data.

Results: In cases with the MPD < 5 mm, the optimal age to stop the surveillance was 84 years for males compared to 77 years for females. In cases with the MPD = 5-9.9 mm, the ICERs remained below the willingness-to-pay threshold both for males and females. The ICERs almost plateaued until age 75 years for all subgroups but females with the MPD = 5-9.9 mm representing a continuous increase during this range.

Conclusions: The cost-effectiveness of long-term surveillance of IPMN patients depended on sex and the MPD diameter, suggesting the potential to personalize patient management from the health economic perspective.

Keywords: Health Care Costs; Pancreatic Cyst; Pancreatic Neoplasms; Risk Factors.