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Summary

A MATHEMATICAL SIMULATION MODEL DETERMINES THE OPTIMAL ENDOSCOPIC SCREENING STRATEGY FOR THE DETECTION OF HELICOBACTER PYLORI-NAÏVE GASTRIC NEOPLASM

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Mathematical simulation modeling using a large Japanese cohort of 519,368 screening esophagogastroduodenoscopy cases identified that screening every 5 years starting at age 45 is the most efficient strategy to detect Helicobacter pylori-naïve gastric neoplasms.

KEY POINTS

- H. pylori-naïve gastric neoplasms were detected in 0.021% of 519,368 screening esophagogastroduodenoscopy cases from 12 Japanese institutions between 2016 and 2022, with lesions found across all age groups from 20s to 80s.
- Among screening strategies with detection rates of 50% or higher, the 5-year interval strategy starting at age 45 had the lowest number-needed-to-test for all tumor types: 4.89 for pure signet ring cell carcinoma, 9.92 for gastric adenocarcinoma of fundic gland type, and 4.69 for undifferentiated cancer.
- With the 5-year interval strategy starting at age 45, most H. pylori-naïve gastric neoplasms were detected at less than 20mm in size and the deep submucosal invasion rate was less than 30%.
- Tumor growth rates varied by type: 2.5 mm/year for pure signet ring cell carcinoma, 2.7 mm/year for gastric adenocarcinoma of fundic gland type, 1.2 mm/year for foveolar gastric adenoma-raspberry type, and 11.7 mm/year for undifferentiated carcinoma.
- This study is relevant for clinicians and policymakers designing gastric cancer screening programs in populations with declining H. pylori infection rates.

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