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Importance of Early Diagnosis of Gastrointestinal Tumors: A Brief Review

Emily Eduarda Hellmann[1*], Ian Caldeira Ruppen[1], Fernando de Oliveira Dutra[2], André Cesar Leandro[1], Larissa da Rosa Piccoli[1], Tauane Cano Barreto[1], Ana Paula Mendes[1], Priscila De Oliveira Barros[1], Camilla Antunes Zanini[3], Sarila Hali Kloster Lopes[1], Lara Beatriz Dallaqua Bitiati[1], Bruno Tadim Carderelli[4], Henrique Marques Dagostin[5], Fernanda Romagnole Pugliese[5], Ana Carolina Langendyk Rodrigues[1] and Maria Clara Costa Calvo[1]

[1]Centro Universitario Inga Uninga, Maringa, PR, Brazil

[2]Hospital Memorial Uninga HMU, Maringa, PR, Brazil

[3]Faculdade Morgana Potrich, Mineiros, GO, Brazil

[4]Faculdade Cesumar Unicesumar, Maringa, PR Brazil

[5]Universidade Federal Rural do Semi Arido UFERSA Mossoro RN, Brazil

ABSTRACT

Gastrointestinal tumors (GITs) rank among the leading causes of cancer mortality worldwide, accounting for more than one-third of oncology-related deaths estimated for 2024. Evidence shows that five-year survival exceeds 90 % when diagnosis occurs at a localized stage but drops to below 20 % in metastatic disease. This review synthesizes recent literature on the importance of early diagnosis of GITs, explores risk-based screening strategies, and analyzes barriers to their implementation. Searches in PubMed, SciELO, and Embase covered publications from 2020 to 2025. The data demonstrate tangible benefits from colonoscopy, upper gastrointestinal endoscopy, and non-invasive tests such as the fecal immunochemical test and multitarget stool DNA, which reduce colorectal-cancer mortality by 30 %–60 %. Artificial-intelligence tools have increased the sensitivity of endoscopic detection of early lesions, while serum and microbiome biomarkers show promise for pancreatic and gastric-cancer screening. Socio-economic inequalities, procedural fear, and low health literacy nevertheless limit adherence, especially in low- and middle-income countries. Cost-effectiveness models indicate net savings when colonoscopy begins at 45 years of age, given the rising incidence of colorectal cancer in young adults. Investing in early diagnosis is therefore a cost-effective strategy that can save lives and reduce the economic burden of digestive cancers.

***Corresponding author**

Ian Caldeira Ruppen, Centro Universitario Inga Uninga, Maringa, Parana, Brazil.

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Introduction

Tumors of the gastrointestinal tract encompassing the oesophagus, stomach, liver, biliary tract, pancreas, small intestine, colon, and rectum form a heterogeneous group that leads global cancer-incidence and mortality indicators. The International Agency for Research on Cancer estimated that almost 20 million new malignancies were diagnosed in 2022, roughly one-third of which originated in the GIT (WHO, 2024). Despite therapeutic advances, most of these neoplasms are still detected at advanced stages, limiting curative treatment options and yielding five-year survival rates below 30 % [1]. Early detection is thus pivotal in digestive oncology because it permits less aggressive interventions and markedly better prognoses. Initial tumors may be treated with endoscopic resections or minimally invasive surgery, often obviating systemic chemotherapy and radiotherapy. The biological rationale for screening rests on the stepwise progression of premalignant lesions such as colorectal adenomas or gastric metaplasia to invasive carcinoma over years, creating a window for curative detection and therapy. Contemporary guidelines recommend ten-yearly colonoscopy or annual stool testing from 45 years of age for average-risk individuals.

In gastric cancer, high incidence nations such as Japan and South Korea have adopted national endoscopic programmes, cutting mortality by more than 40 %. Global implementation faces obstacles including examination costs, limited specialist resources, uneven healthcare access, and cultural resistance to screening. In Brazil, for instance, fewer than 25 % of the target population undergo colonoscopy within the recommended interval. Understanding the roots of low engagement is imperative for effective public policy design. Against this backdrop, the present article critically reviews the importance of early diagnosis of gastrointestinal tumours, describes the principal available screening methods, and discusses barriers and prospects for expanding population coverage [2-5].

Objectives

This article aims to review the importance of early diagnosis of gastrointestinal tumours, highlighting effective screening strategies, clinical benefits, and the barriers encountered.

Materials and Methods

A narrative review was conducted using articles indexed in PubMed, ScienceDirect, and SCIELO to underpin the study.

Discussion

Screening modalities for GITs have evolved substantially over the past decade. Colonoscopy remains the gold standard for colorectal-cancer prevention because it allows detection and removal of adenomatous polyps in a single procedure. Cohort studies show a 65 % reduction in disease-specific mortality among regularly screened individuals. Nevertheless, large-scale adoption is curbed by logistical constraints and patient-reported discomfort. As alternatives, DNA-based stool tests exhibit > 92 % sensitivity for advanced lesions and can be performed at home, improving adherence.

In upper-GI endoscopy, high-definition imaging, virtual chromoscopy, and artificial intelligence have raised accuracy in identifying superficial oesophageal and gastric lesions. Deep-learning models trained to recognise microscopic patterns push diagnostic sensitivity beyond 95 %, reducing inter-observer variability. Pancreatic cancer remains challenging because of its deep location and silent evolution. Current research focuses on exosome-, microRNA-, and circulating DNA methylation-based biomarkers that could anticipate diagnosis by up to 12 months. Phase-II trials report 87 % sensitivity for tumours ≤ 2 cm, though specificity still needs improvement [6-10].

Cost-effectiveness is equally crucial. Economic models suggest that starting colorectal screening at 45 years yields 0.7 quality-adjusted life-years at an incremental cost of US$ 14 500 well below cost-effectiveness thresholds in middle-income countries. For gastric cancer, risk-stratified strategies targeting Helicobacter pylori infection and family history prove more sustainable than universal programmes. Cultural and socio-economic barriers remain decisive. Qualitative studies in Brazil identify fear of sedation, anxiety about results, and low risk perception as main reasons for refusal. Community-health-worker education and SMS reminders boosted faecal-occult-blood-test coverage by 18 % in northeastern municipalities. Finally, digital Technologies patient-navigation apps and tele-endoscopy emerge as strategies to overcome geographical disparities, offering initial triage in remote areas with subsequent referral to specialist centres [11-18].

Conclusion

Early diagnosis of gastrointestinal tumours is essential for lowering the global cancer burden. Robust evidence shows that structured screening programmes enhance survival, decrease mortality, and are financially viable, especially when targeted at high-risk populations. To spread these benefits broadly, it is imperative to tackle access barriers, improve health education, and invest in diagnostic infrastructure. Integrating new Technologies artificial intelligence, molecular biomarkers, and digital-health platforms offers unprecedented opportunities to expand screening coverage and quality.

Such tools can ease the burden on specialists by automating exam interpretation and tailoring risk stratification. Even so, effective adoption depends on health policies that ensure equitable access and financial sustainability. We recommend formulating national guidelines that harmonise scientific evidence with local realities, incorporating community education, professional training, and adequate funding. Building robust population-based cancer registries is likewise critical for monitoring programme impact and continually refining adopted strategies. In short, investing in early diagnosis of gastrointestinal tumours is an investment in longevity and quality of life. The convergence of science, public policy, and social engagement is the most promising path to transform the landscape of digestive cancers in the coming decades.

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