Screening for upper gastrointestinal cancer in Hong Kong

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Introduction

Gastric and oesophageal cancers are both highly lethal but often overlooked diseases in Hong Kong. During the early stages of these cancers, patients are typically asymptomatic or exhibit only mild symptoms, leading to late diagnoses, delayed treatment, and poor prognoses. Although the prevalences of both cancers have declined in recent decades, coinciding with a reduction in the number of smokers,[1] the likelihood of advanced metastasis at diagnosis and the associated mortality rates remain substantially higher relative to cancers such as prostate cancer.[2] In 2021, 1306 cases of gastric cancer were newly diagnosed[1]; 631 patients succumbed to the disease in the same year, making it the sixth leading cause of cancer-related deaths in Hong Kong.[1] From 2017 to 2021, the mortality-to-incidence ratios were 0.48 for men and 0.44 for women, reflecting a low 5-year survival rate.[3] Although the prevalence of oesophageal cancer has declined in recent years, its mortality rate remains high.[4] In 2021, 397 new cases of oesophageal cancer were diagnosed, and 299 deaths were reported in the same year.[5] By 2021, it was the tenth leading cause of cancer-related deaths in Hong Kong.[6]

Oesophagogastroduodenoscopy indications in Hong Kong

Among all gastrointestinal (GI) cancers, population screening in Hong Kong is only available for colorectal cancer (via the faecal immunochemical test). Due to the comparatively lower incidences of upper GI cancers, no formal screening programme currently exists. Diagnosis of these cancers mainly relies on opportunistic endoscopic screening in patients who present with non-localising symptoms. Non-invasive screening tools for upper GI cancers are currently lacking, despite some promising modalities under investigation. A recent study validated a scoring system that incorporates weighted risk factors based on their contribution to gastric cancer development.[7] However, in Hong Kong's public hospitals, oesophagogastroduodenoscopy (OGD) is primarily indicated for suspected or confirmed cases of peptic ulcer disease, GI bleeding, oesophageal or gastric cancer; it is also indicated for symptoms such as indigestion, acid reflux, or dysphagia.[8] By the time diagnostic symptoms appear, most patients display advanced cancer beyond curative treatment, resulting in poor survival outcomes. Thus, a comprehensive screening model for upper GI cancers is urgently needed.

Global screening strategies

Screening approaches for gastric and oesophageal cancers considerably vary worldwide, shaped by regional factors such as cancer prevalence, healthcare infrastructure, and medical policies. The local incidences of these cancers serve as the main determinants of screening strategies.

In regions with higher incidence rates, broader population-based screening is often utilised. In Japan, population-based screening is conducted using endoscopic and radiographic examinations, as outlined in the Japanese Guidelines for Gastric Cancer Screening.[9] Endoscopic screening was added in 2014, despite challenges related to accessibility.[9] Similarly, in Korea, biennial screening for gastric cancer is conducted among individuals aged >40 years[10] via barium swallow, computed tomography, or endoscopy.[11] In China where gastric cancer is also prevalent, screening strategies focus on high-risk populations through endoscopic examinations and serum pepsinogen testing[12]; high-risk groups are identified based on geographical prevalence.[12] Regarding oesophageal cancer, similar targeted approaches are implemented. In regions with high rates of oesophageal squamous cell carcinoma, such as the Taihang Mountain range in China, population-

based screening includes endoscopic examinations and cytology testing.[13]

Hong Kong, exhibiting comparatively lower incidences of both gastric and oesophageal cancers, highlights the limitations of a one-size-fits-all approach to cancer screening. A microsimulation model projecting population-wide gastric cancer screening in low-prevalence regions, such as the US, indicated a cost per quality-adjusted life year exceeding US$100 000, suggesting that such an approach is economically inefficient.[14] Therefore, opportunistic screening focused on high-risk individuals is considered a more cost-effective strategy in these settings.

Countries where the incidence of gastric cancer is lower (eg, the US, the UK, and Singapore) do not implement routine population-wide screening programmes. Screening in these regions is more selective, targeting high-risk individuals, such as those with a family history of gastric cancer or carriers of *Helicobacter pylori*. In the US, targeted oesophageal cancer screening is recommended for individuals with Barrett's oesophagus, given their increased risk of oesophageal adenocarcinoma.[15] The frequency of endoscopic surveillance is determined by the severity of dysplasia identified in Barrett's oesophagus.[15] Medium-incidence countries have demonstrated potential benefits from targeting specific high-risk populations, often based on age.[16]

This variability in screening protocols underscores the need for region-specific strategies that consider local disease prevalence, healthcare infrastructure, and socio-economic factors.

Currently available prediction models

Rather than assessing the risk of each cancer individually, a combined gastroesophageal risk prediction model offers a comprehensive assessment of the overall risk for developing upper GI cancers. This approach directly informs the need for OGD, providing clinicians with an objective framework to identify and prioritise patients who would benefit most from endoscopic evaluation. Only one combined gastroesophageal cancer risk prediction model has been developed for the general population.[17] Although this model demonstrates relatively high discriminatory capability, as validated by two separate large-cohort studies,[17,18] it may not be directly applicable to clinical practice in Hong Kong for the following reasons.

First, the model was developed and validated in the UK, primarily using data from a Western population.[17,18] Variations in cancer risk factors among ethnic groups are well documented; for example, the incidence of gastric cancer is higher in Asian populations due to gene-environment interactions.[19] Therefore, the hazard ratios for risk factors derived from the UK population may not be suitable for the Southern Chinese population in Hong Kong. A model tailored to risk factors directly relevant to the Hong Kong population would likely provide greater discriminatory capability and clinical utility.

Second, the existing model heavily relies on the presence of 'alarm symptoms' for gastroesophageal cancer reported by patients to their general practitioners, such as dysphagia, abdominal pain, and appetite loss. Although these symptoms are sensitive indicators of cancer, their use as primary predictors limits the model's effectiveness in identifying patients at elevated risk during the early stages of cancer progression. Early-stage cancers are often asymptomatic or associated with subtle symptoms that may not be clinically apparent. The incorporation of readily available and objectively measurable factors, such as demographic data and medical history, into the model could facilitate more effective stratification of patients requiring OGD screening, enabling earlier medical intervention before substantial disease progression.

Conclusion

The high mortality-to-incidence ratios associated with gastric and oesophageal cancers represent considerable public health challenges in Hong Kong. However, the current methods for cancer risk stratification and patient selection for further investigation remain inadequate. The use of de-identified clinical data from patients previously diagnosed with oesophageal and gastric cancers, accessible through the Clinical Data Analysis and Reporting System of the Hospital Authority, would enable the development of a prediction model tailored to the Hong Kong population. The incorporation of such a prediction model into routine clinical practice could enhance the early detection of upper GI cancers, facilitate timely medical intervention, and improve treatment outcomes. This approach offers a promising strategy for reducing the mortality associated with upper GI cancers in Hong Kong.

Author contributions

Concept or design: All authors.
Acquisition of data: CWK Hui, JNF Lam, KH Man.
Analysis or interpretation of data: CWK Hui, JNF Lam, KH Man.
Drafting of the manuscript: All authors.
Critical revision of the manuscript for important intellectual content: All authors.

All authors had full access to the data, contributed to the study, approved the final version for publication, and take responsibility for its accuracy and integrity.

Conflicts of interest

All authors have disclosed no conflicts of interest.

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