

Proposal of A Stomach Cancer Screening Program for A Latin American Population

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Abstract:

Gastric cancer is an importantly prevalent and incident disease with a high mortality rate, it is the fourth cause of cancer, and the second cause of death from malignant tumors in the world. Many risk factors are associated with gastric adenocarcinoma and its pathogenesis is multifactorial. Diagnosis of gastric cancer is frequently made in advanced stages of the disease, implying a poor survival rate. Early detection is of great significance and utility in reducing mortality, but there are no global screening strategies. Screening and surveillance for premalignant lesions is of special interest because of their potential progression to gastric cancer and the possibility to avoid it. Gastric cancer screening strategies are useful in places with a high incidence. Therefore, it is necessary to adopt early detection programs for gastric cancer applied to Latin America. So, we propose a program with that purpose with a comprehensive vision as a route of admission, diagnosis, management, follow-up, and evaluation of results and impact, in favor of the health status of patients at potential risk of gastric cancer.

1. Introduction:

Gastric cancer is a disease with a high mortality rate, it is the fourth cause of cancer, and the second cause of death from malignant tumors in the world. Although many risk factors are associated with gastric adenocarcinoma, there are still no definite causes. The pathogenesis is most likely multifactorial. The existence of a sequence of histological premalignant changes has been widely postulated, progressing from atrophic gastritis to intestinal metaplasia and finally to gastric adenocarcinoma, these premalignant histological changes may be necessary, but they are not clearly sufficient for the development of this entity [1,3,5]. Gastric cancer results from successive changes that the gastric mucosa undergoes since childhood, whose slow and progressive progression originates deep transformations and ultimately originates the tumor [1,2,3,4]. *Helicobacter pylori* is strongly implicated in the etiology of gastric cancer [23,25]. The risk of infection throughout life in developed countries is 40 to 60%, but it is very high in developing countries where it can reach up to 90%, as we can see in Latin America [9, 17, 25, 26].

The diagnosis of gastric cancer in advanced stages of the disease implies a worse survival rate. Early detection is of great significance and utility in reducing mortality, but there are no global screening strategies [1,5,6,7,8].

Identification of premalignant lesions is important for the purpose of screening and surveillance. The annual progression of them to gastric cancer is estimated between 0 and 1.8% for atrophic gastritis, 0 to 10% for intestinal metaplasia and 0 to 73% for dysplasia; with an annual incidence of 0.2% for atrophic gastritis, 0.25% for intestinal metaplasia, 0.6% for mild to moderate dysplasia, and 6% for severe dysplasia. Endoscopic surveillance in these cases ensure early detection and curable stages of the disease [9, 10, 11, 12, 13].

Gastric cancer screening strategies have proven to be useful in regions where there is a high incidence [13, 14, 16, 18, 19, 20, 21, 27]. Therefore, it is necessary to adopt an early detection program for gastric cancer applied to our environment.

The program presented below brings together a comprehensive vision as a route of admission, diagnosis, management, follow-up, and results in favor of the health status



of patients at potential risk of developing or with gastric cancer.

Objectives:

2.1. General:

Implement a care route that allows early detection of gastric cancer in a developing country population, seeking to reduce the complications that may occur in patients through the identification of risks, timely intervention, follow-up, accompaniment and education for the patient and his family.

2.2. Specific:

- Facilitate the follow-up of patients with risk factors for stomach cancer.
- Early identification of patients with a suspected diagnosis of stomach cancer.
- Provide systematic and organized management to reduce access barriers for patients with gastric cancer diagnosis.
- Carry out a comprehensive and protocolized management of the patient with a suspected or established diagnosis of stomach cancer, to improve survival, reduce morbidity and mortality, decrease the number of hospital admissions and improve their quality of life.
- Provide psychosocial support for patients, their families and caregivers according to the different stages of disease, facilitating feedback with specific and advanced evidence - based treatment options.

3. Justification:

Contemporarily, the initiatives for the management, control and monitoring of patients should be framed within the model determined by the triple health goal:

- IMPROVE PATIENT EXPERIENCE
- IMPROVE HEALTH OF THE POPULATION
- REDUCE THE COST PER CAPITA

In accordance with the first component, individualized care focused on quality, safety, equity, opportunity, generated by interdisciplinary professionals suitable in the provision of health services guarantees the differential framework in the care experience.

Regarding the improvement of population health, the program clearly justifies what to do in the route promulgated for early detection, care, monitoring and quantification of the impact of diagnostic and therapeutic interventions, which guarantee to maintain their vital situation in accordance with quality of life and adequate health standards.

In an integrative way, taking the patient through an adequate control path, necessarily implies the reduction of the costs derived from the care process. This aspect takes visibility with the aim of the program to improve the successful detection of factors of risk, premalignant lesions and early gastric cancer to improve prognosis and reduce morbidity and mortality related s with advanced gastric cancer, and optimize patterns treatment and close monitoring [21, 22, 23, 24, 25, 27].

Gastric cancer early detection programs have shown great utility and impact on the prognosis of gastric cancer, an example given by the Japanese program, in which approximately 1 case is detected for every 800 patients examined, half of them in the early stage (the latter explains the positive impact on mortality) . In the Western world, the overall 5-year survival after the diagnosis of gastric cancer is less than 25%, with detection programs Japan has achieved that survival in advanced gastric cancer reaches around 52%, and when an effective early detection survival reaches 95% [2, 6, 7, 8, 12, 13].

Endoscopic evaluation of the esophagus, stomach and duodenum with biopsy is the standard method for the diagnosis of cancer gastric. The technique is highly sensitive when performed by experienced specialists, and allows detection of early stages lesions [14, 15, 16, 17, 20, 21, 25, 27].

It is necessary to establish the importance of control with follow-up by an interdisciplinary group that guides the patient and his family in the identification of alarm signs, recognition of the importance of not abandoning the established treatment and follow-up , under a care scheme focused on individualization of the patient, their environment, as well as the need of health personnel to keep the patient in the best conditions of well - being and management of their pathology.

4. SCOPE:

From patient recruitment (induced demand, referral for general medicine, specialties, subspecialties, hospitalization), to referral to the specialty of oncology or discharge of the patient after follow-up.

5. Target Population:

Population older than 18 years old with uninvestigated dyspepsia and no response to optimal initial management with a proton pump inhibitor. Population over 35 years of age with dyspeptic symptoms without previous studies, regardless of the response to medical management. People with risk factors for gastric cancer, with warning signs (abnormal weight loss, persistent emesis), suspected gastric preneoplastic lesions, and / or diagnosis of gastric cancer.

6. Interdisciplinary Team:

- General Practitioner.
- Gastroenterologist.
- Chief nurse.
- Assistant Nurse.
- Oncologist.
- Oncologic surgeon.

6.1. Functions of The Professionals of The Interdisciplinary Team:

General practitioner (primary health care):

- Carry out the initial recruitment and assessment of patients with dyspeptic symptoms and suggestive of upper digestive



tract pathology that require admission to the program.

- Classify the risk and relevance of evaluation by gastroenterology, and the need for additional studies (upper digestive endoscopy).
- Establish initial therapeutic treatment according to the patient's symptoms.
- Medical follow up and adjustments to medication and habits; reassess the need for an endoscopic study.
- Generate adherence to the program and the instructions.
- Educate the patient and family.
- Initial review of the results of the studies generated in the program.
- Direct the patient to the chief nurse assigned to the program.
- Generate the necessary referrals considering the level of priority and informing about them to the chief nurse.

Gastroenterologist:

- Establish the relevance and continuity of pharmacological or interventional management, according to the risk of the patient.
- Approach, management and monitoring of gastric premalignant lesions.
- Approach, management, staging and follow-up of the patient with early gastric cancer.
- Approach and staging of the patient diagnosed with advanced stomach cancer.
- Identify and refer patients susceptible to assessment and management for oncology and oncological surgery.
- Educate the patient and family.
- Generate adherence to the program and the instructions.
- Direct the patient to the head of nursing assigned to the program.

Chief nurse:

- Coordinate the reception of the patient who subscribes the program.
- Establish and record all the communication mechanisms necessary for adequate future monitoring.
- Detect current and potential barriers in the management of each patient, individually.
- Provide education and answer questions to the patient and his family.
- Carry out phone follow-up.
- Watch adherence to monitoring and treatment, checking timely attendance controls.
- Realize and optimize the management of the results of interventions performed.
- Carry out monitoring and evaluation of the program indicators.

Assistant nurse:

- Follow-up check in and check out from the program.
- Manage the database of the program's patients.
- Carry out phone follow-up to patients, seeking adherence to the process and controls.

- Manage opportunely availability of studies results, and subsequent attention with their reports.
- Inform the head chief nurse and the gastroenterologist about relevant data for decision-making with patients (reports of studies and of pathology biopsy).

Oncologist:

- Assessment, approach, and intervention of the patient diagnosed with stomach cancer.
- Follow-up and control of the patient with gastric cancer.
- Therapeutic proposal according to the stage of the disease.
- Provide education and solve doubts to the patient and family.

Oncological Surgeon:

- Assessment, approach, and intervention of the patient diagnosed with stomach cancer.
- Follow-up and control of the patient with gastric cancer.
- Surgical therapeutic proposal according to the stage of the disease.
- Provide education and solve doubts to the patient and the family.

7. Inclusion and Exclusion Criteria:

Inclusion:

- Patients (Men or Women) ≥ 18 years old with uninvestigated dyspeptic symptoms, without response to optimal therapeutic treatment established, or with warning signs.
- Over 35 years old patients with uninvestigated dyspeptic symptoms, regardless of response to medical management.
 - Risk factors for gastric cancer.
 - Family history of gastric cancer in first-degree.
 - Hereditary genetic disorders.
 - Lynch syndrome (hereditary nonpolyposis colorectal cancer).
 - Familial adenomatous polyposis (FAP).
 - Diffuse hereditary gastric cancer.
 - Hereditary breast and ovarian cancers.
 - BRCA1 and BRCA2 mutations.
 - Li-Fraumeni syndrome.
 - Peutz-Jeghers syndrome.
 - Rich salty foods cured meats (nitrates and nitrites), smoked foods.
 - Antecedent person I of pernicious anemia or achlorhydria.
 - Smoking.
 - Alcoholism.
 - Obesity (mainly in men).
 - Atrophic chronic gastritis (*H. pylori*). Intestinal metaplasia - Mucous dysplasia.
 - MALT-type gastric lymphoma.
 - Previous gastric surgery, especially for acid-peptic disease.
 - Ménétrier's disease (hypertrophic gastropathy).
 - Blood type.
 - Epstein Barr virus.
 - Gastric adenomatous polyps.
 - Industries workers (metal, carbon, rubber, silica, lead,



asbestos).

- Common variable immunodeficiency.
- Voluntary acceptance to enter the program.

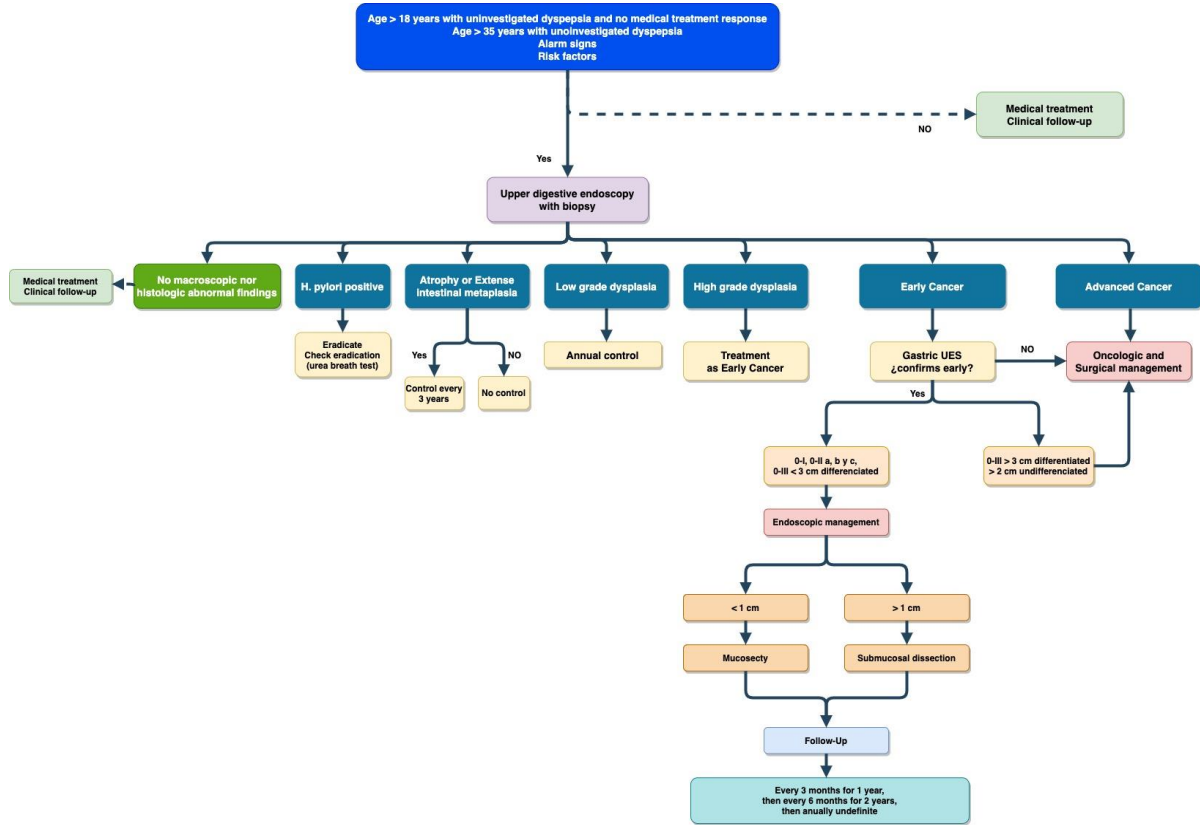
Exclusion:

- Patients under 35 years old without risk factors or warning

signs detected after an adequate clinical evaluation. Patients with dyspepsia, without abnormal endoscopic or histological findings.

studied

8. Attention Route:



Chief Nurse:

9. Process:

Step by step patient care, from entry until their release for the program of detection of gastric cancer, comprising the following steps:

9.1. Admission to the program:

9.1.1. Patient uptake:

Responsible: General practitioner (outpatient consultation, emergencies, hospitalization). Specialist physician (family medicine, internal medicine, general surgery, gastroenterology).

- Complete clinical evaluation of the patient and verification of inclusion criteria as potential members of the gastric cancer detection program.
- Feed the database of patients referred or indicated for admission to the stomach cancer detection program.
- Follow-up patients directed (outpatient, emergency and hospitalization).
- Assign an assessment appointment with the nurse to verify criteria and complete registration in the program.

9.1.2. Assessment of inclusion and exclusion criteria:

Responsible:

- Evaluate and verify inclusion and exclusion criteria of the patient.
- Comprehensively assess patients.
- Provide program information to the patient and how it works.
- Assign assessment appointment for the first time or for tracking control as required.
- Evaluate previously generated orders and / or pending studies to manage them.

9.1.3. Medical consultation for the first time:

Responsible:

Medical leader of the program (General Practitioner or Gastroenterologist):

- Carry out an assessment of symptoms, presence of risk factors and warning signs for gastric cancer.
- Evaluate response to previous treatments and their quality.
- Determine indication and relevance of performing an upper digestive endoscopic study.
- Evaluation of previous studies, including endoscopies with their respective histopathology reports.
- Determine the need and timing of specialized evaluation.
- Explain the patient and their caregiver: Current diagnosis and



plan to follow.

- Define patient follow-up according to the medical evaluation performed.

9.2. Follow-up:

Directed follow-up in accordance with identified risks, and endoscopic and histopathologic findings, defining frequency of consultations, specialized evaluation, additional studies, etc.

9.2.1. Follow-up by General Medicine (Medical Leader):

- Define need for continued follow-up in the stomach cancer detection program.
- Verify compliance with therapeutic regimen and compliance with the recommendations given in the previous consultation, and the symptomatic and clinical response.
- Evaluate results of both upper digestive endoscopy and histopathology of biopsies; determine the need for additional studies or interventions, evaluation by gastroenterology, oncology and / or oncological surgery.
- Make the necessary interventions derived from the results of studies carried out (For example *H. pylori* eradication and urea breath test to further evaluate its eradication, and new control with its report).
- Educate about effective intervention regarding modifiable risk factors for gastric cancer.
- Educate the patient and family regarding outcomes, risk factors, therapy, intervention regarding risk factors, and follow-up plan.
- Define follow-up control periodicity.

9.2.2. Follow-up by Gastroenterology:

- Perform comprehensive assessment of patients with risk factors for gastric cancer, and with abnormal findings in endoscopic and histopathological studies.
- Determine need and priority for specialized monitoring.
- Determine need and periodicity of clinical and endoscopic controls.
- Strengthen patient and family education.
- Generate the required additional study orders.
- Determine the requirement for clinical and surgical oncological assessment.

9.2.3. Monitoring by nursery:

- Carry out a comprehensive assessment of the patient evaluating the ability to comply with therapeutic regimens, knowledge and actions in the event of alarm signs.
- Review medical history to determine the established management and ordered controls and studies.
- Carry out an individualized by phone or face-to-face follow-up plan.
- Detect if there are unjustified delays in conducting studies and obtaining their results.
- Identify presence of psychosocial risk factors.
- Provide education in aspects related to the program.

- Promote treatment adherence, non-pharmacological recommendations, lifestyle changes and attendance at check-ups.

9.3. Discharge:

- There will be discharged from the program by the leading doctor or gastroenterologist patients who in the evaluation of their dyspeptic symptoms are not detected risk factors or warning signs for gastric cancer, and whose endoscopic and histopathologic examinations are normal.
- Similarly, will be discharged patients whose dyspeptic symptoms are not related to risk factors or warning signs for gastric cancer, and whose endoscopic and histopathological evaluation only demonstrate *H. pylori* infection and eradication has been carried out satisfactorily.
- Patients who do not meet the inclusion criteria for the program will be discharged.

10. Indicators and Measurement of The Impact of The Program:

The indicators to be evaluated in the measurement of impact of the program will be:

- Rate of patients with premalignant lesions: Number of patients with premalignant lesions / Total number of patients admitted to the program.
- Rate of patients with low-grade dysplasia: Number of patients with low-grade dysplasia / Total number of patients admitted to the program
- Rate of patients with high-grade dysplasia: Number of patients with high-grade dysplasia / Total number of patients admitted to the program
- Rate of patients with early gastric cancer: Number of patients with early gastric cancer / Total number of patients admitted to the program
- Rate of patients with advanced gastric cancer: Number of patients with advanced gastric cancer / Total number of patients admitted to the program
- Rate of patients with *H. pylori* infection: Number of patients with *H. pylori* / Total number of patients admitted to the program
- Eradication of *H. pylori* infection: Number of patients with negative breath urea test after eradication therapy / Total number of patients with confirmed *H. pylori*
- 1-year survival of early gastric cancer: Number of surviving patients with early gastric cancer at 1 year / Total number of patients with early gastric cancer
- 5-year survival of early gastric cancer: Number of surviving patients with early gastric cancer at 5 years / Total number of patients with early gastric cancer
- 1-year survival of advanced gastric cancer: Number of surviving patients with advanced gastric cancer at 1 year / Total number of patients with early gastric cancer
- 5-year survival of advanced gastric cancer: Number of surviving patients with advanced gastric cancer at 5 years / Total number of patients with early gastric cancer
- Adherence to the program: Number of patients who attended



at least 50% of program appointments / Total number of program patients

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