GUIDELINES FOR THE MANAGEMENT OF
DYSPEPSIA AND GASTROESOPHAGEAL REFLUX
DISEASE (GERD)

GUIDELINES COMMITTEE
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PREFACE
Acid peptic disorders have been with mankind for centuries but till date there exist numerous gaps in knowledge and controversies in the understanding of these conditions. Dyspepsia and gastroesophageal reflux disease (GERD) are the key acid-peptic disorders and account for over half of cases seen in gastroenterology practice.

In her bid to provide the necessary leadership in the management of diseases of the gastrointestinal system in Nigeria, Society for Gastroenterology and Hepatology in Nigeria (SOGHIN) appointed a committee of 3 members and charged it with the responsibility of drawing up guidelines for the management of dyspepsia and GERD.

The committee members promptly took up the challenge and approached the task by doing extensive literature search and critical review of identified articles. Similar guidelines published by other national professional societies were reviewed. The task was concluded with two meetings where the members had a very robust debate on the recommendations before coming up with this document. The peculiarities of our setting regarding culture, available resources and technology have been taken into consideration in making the recommendations.

This guideline is the first of its kind in SOGHIN and indeed Nigeria. It is expected to serve as a guidance to doctors (non-gastroenterologists and gastroenterologists) in the evaluation and treatment of patients who present with dyspepsia and GERD. The recommendations should not be construed as establishing a legal standard of care or as encouraging any particular treatment. It is intended to indicate preferred approaches to dyspepsia and GERD as established by scientifically valid research and would be revised as necessary to accommodate the rapid improvements in knowledge.

The committee members are immensely grateful to the Executive Council and all members of SOGHIN for the opportunity to serve.

INTRODUCTION
Dyspepsia is a clinical syndrome which comprises a series of symptoms that originate from the gastroduodenal region of the gastrointestinal tract. The symptoms may be episodic, recurrent or chronic and are often associated with eating, but this is not always the case. It classically presents as pain in the upper abdomen which is usually described as a burning sensation, heaviness or an ache. Other symptoms include a feeling of fullness, easy satiety after meals, anorexia, bloating, belching, nausea and vomiting.
Gastroesophageal reflux disease (GERD) is also a disorder of the upper gastrointestinal tract. It results when reflux of gastric contents across the gastroesophageal junction into the esophagus, pharynx or mouth leads to troublesome symptoms and/or complications. Its cardinal symptoms are heartburn and regurgitation. Sometimes the symptoms of dyspepsia overlap with those of GERD.

The nomenclature for dyspepsia is confusing. This is largely because some medical organizations include all upper gastrointestinal (UGI) symptoms in the term dyspepsia, then separate patients with symptoms suggesting gastro-esophageal reflux disease (GERD) for appropriate management, whereas others recognize the overlap in symptoms between the various causes of UGI symptoms but choose to separate the symptoms suggesting GERD before applying the term dyspepsia. Both approaches recommend identifying patients whose symptoms suggest GERD and managing them as having reflux disease. However, emerging data suggest that excluding all patients with any heartburn or regurgitation from the diagnosis of dyspepsia is over-simplistic and potentially misleading. Consequently, some experts are proposing the term “dyspepsia complex” to accommodate patients with dyspeptic and reflux symptoms particularly their functional variants (functional dyspepsia and functional heartburn). These experts are of the view that both conditions may be part of one disease complex.In the Rome III criteria, patients presenting with symptoms suggestive of GERD are isolated before applying the term dyspepsia and this guideline is built on that format.

Dyspepsia is one of the most common disorders in medicine, with affected patients seen on daily basis not only by gastroenterologists, but also by physicians in a variety of other fields. Most affected people do not seek medical care. Although the disorder does not affect survival, it is responsible for substantial health care costs and significantly affects quality of life.

Nigeria belongs to the group of poorer countries of the world where medical care is grossly inadequate with high rates of infant mortality and malnutrition, low life expectancy and high mortality from infectious diseases like malaria, tuberculosis and HIV/AIDS. The precarious nature of health care underscores the need for a guideline for the management of this common gastrointestinal problem. This would ensure that limited resources are neither overused, underused, nor misused.

This guideline is intended to be an educational device to provide information that may assist practitioners in providing care to patients with dyspepsia. It is not a rule and should not be construed as establishing a legal standard of care or as encouraging any particular treatment. It is intended to indicate preferred approaches to medical problems as established by scientifically valid research. Clinical decisions in any particular case involves a complex analysis of the patient's condition and available courses of action. Therefore, clinical considerations may lead a physician to take a course of action that varies from this guideline. This guideline may be revised as necessary to accommodate improvements in knowledge, emergence of new data or other aspects of clinical practice.

Rationale for Guideline

(1.) Provision of a relevant guide to the diagnosis and management of dyspepsia and GERD for primary care physicians and gastroenterologists.

(2.) Articulation of the experience and views of Nigerian experts on dyspepsia and GERD.

(3.) Adaptation of global best practices in the management of dyspepsia and GERD to Nigeria's peculiar socio-economic circumstances.

(4.) Standardization of research among different practitioners in Nigeria.

(5.) Facilitation of training and supervision of health care providers.

(6.) Judicious use of scarce resources for health care.

(7.) Identification of areas that need further research.

DYSPEPSIA

Definition:
According to the Rome III criteria, dyspepsia is defined as one or more of the following symptoms:

- Postprandial fullness
- Early satiation
- Epigastric pain
- Epigastric burning
Postprandial fullness is a feeling of prolonged persistence of food in the stomach. Early satiation is a feeling that the stomach is overfilled soon after starting to eat, out of proportion to the size of the meal being eaten, so that the meal cannot be finished. Epigastric pain refers to a subjective unpleasant sensation. Epigastric burning refers to an unpleasant sensation of heat.

Postprandial fullness and early satiation are meal related symptoms and they described as postprandial distress syndrome (PDS) while epigastric pain and epigastric burning are not necessarily meal related and they constitute epigastric pain syndrome (EPS).

Other symptoms commonly complained about by dyspeptic patients include bloating in the upper abdomen, nausea, vomiting and belching.

Heartburn and/or regurgitation are excluded from diagnostic symptom criteria for dyspepsia since they are suggestive of GERD. However, there is a high degree of overlap between GERD and dyspepsia. When such overlap occurs, the symptomatic classification of the patient would be determined by the predominant symptom.

UNINVESTIGATED DYSPEPSIA
This is a form of dyspepsia that has not been recently investigated by upper gastrointestinal endoscopy. This investigation is the standard requirement internationally for classifying dyspepsia into organic or functional.

1. For Nigerian patients with dyspepsia, stool microscopy and culture, and abdominal ultrasonography should be included because intestinal parasites and liver disease are relatively common.

Functional Dyspepsia
According to Rome III criteria, functional dyspepsia (FD) is defined as presence of at least one of the following:
- Postprandial fullness
- Early satiation
- Epigastric pain
- Epigastric burning
AND no evidence of structural disease that is likely to explain the symptoms.

Note: Criteria must be fulfilled for the past three months, with symptoms at least six months before diagnosis.

Functional dyspepsia accounts for over 60% of dyspepsia in most parts of the world, including Nigeria.

2. Functional dyspepsia can be diagnosed in a patient with dyspepsia if upper gastrointestinal endoscopy, stool examination and abdominal ultrasonography fail to reveal a potential cause for the dyspepsia.

Organic Dyspepsia

3. This is defined as dyspepsia which has been investigated and a structural, systemic or biochemical cause for the symptom revealed. The investigation should include upper gastrointestinal endoscopy, stool microscopy/culture and abdominal ultrasonography.

Causes of Organic Dyspepsia
- Peptic ulcer disease
- Reflux esophagitis
- Gastric or esophageal cancer
- Pancreatic cancer
- Drugs
- Gastroparesis
- Hepatoma
- Intestinal parasites (Giardia, Strongyloides)
- Infiltrative diseases of stomach (Crohn’s disease, Sarcoidosis)
- Metabolic disturbances (hypercalcemia, hyperkalemia)
- Pancreatitis
- Systemic disorders (Diabetes mellitus, thyroid and parathyroid diseases)

Drugs that Commonly Cause Dyspepsia
- Non steroidal anti-inflammatory drugs
- Cox-2 inhibitors
- Bisphosphonates
- Erythromycin
- Tetracyclines
- Iron
- Potassium supplements
Epidemiology
The prevalence of dyspepsia varies considerably between different populations, either due to genuine epidemiological differences or varying definitions used in different population studies. The rapid introduction of new diagnostic criteria for dyspepsia has made very difficult or virtually impossible to compare prevalence rates from different periods or geographical regions12.

In studies using “upper abdominal pain” as the definition, the prevalence of uninvestigated dyspepsia has varied between 7%-34.2%,13-21. When a broader definition of “upper abdominal symptoms” is used to define dyspepsia, a 23%-45% prevalence is observed22-29. A study in Nigeria carried out in 1996 with this definition reported a prevalence of 45%29.

Globally, functional dyspepsia accounts for over 60% of patients with dyspepsia1,11,30. There is a high degree of overlap between FD and other functional gastrointestinal disorders, namely functional heartburn and irritable bowel syndrome11,31-33.

Pathophysiology of Functional Dyspepsia
Functional is a very heterogeneous entity with multifactorial pathophysiology. Putative mechanisms include altered sensory and motor functions, hypersensitivity to mechanical gastric stimulation, impaired acid clearance and enhanced sensitivity, and visceral hypersensitivity. Other mechanisms include Helicobacter pylori infection, low-grade inflammation, and genetic susceptibility34-40.

MANAGEMENT
4. A detailed history and thorough physical examination are the first step in the evaluation of patients with dyspepsia.

History
- Age of the patient is major determinant of the management approach. Patients who are over 40 years of age should undergo early endoscopy
- Patients with one or more “alarm features” should also undergo early endoscopy. Alarm features are features that raise a suspicion of malignant disease (table).

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<thead>
<tr>
<th>Table: Alarm Features</th>
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<td>Unintended weight loss</td>
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<td>Progressive dysphagia</td>
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<td>Odynophagia</td>
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<td>Anorexia</td>
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<td>Family history of gastrointestinal malignancy</td>
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<td>Jaundice</td>
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Palpable Mass or Lymphadenopathy
5. A dominant history of heartburn, regurgitation or cough is suggestive of GERD.
6. Non steroidal anti-inflammatory drug (NSAID) use raises the possibility of NSAID-induced dyspepsia or peptic ulcer disease. A number of other drugs can cause dyspepsia (Table 1)
7. Pain radiation to the back is suggestive of a pancreatic lesion
8. Epigastric or right upper quadrant pain that is severe, episodic and lasting more than 1 hour is suggestive of cholelithiasis.

Physical Examination
Physical examination may be normal except for epigastric tenderness.
9. General examination should be conducted in search of anaemia, lymphadenopathy, masses and other alarm features.
Guidelines for the Management of GERD

Esophageal Syndromes
- Typical reflux syndromes (Heartburn and Regurgitation)
- Reflux chest pain
- Established association
- Reflux cough

Extra-esophageal syndromes
- Proposed association

GERD is a condition which develops when the reflux of stomach contents causes troublesome symptoms and/or complications and/or extra-esophageal syndromes and/or complications.


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10. Carret sign should be elicited in all cases to exclude abdominal wall pain. This is done by tensing the muscles of anterior abdominal wall and demonstrating local tenderness (positive Carret test).

Initial Laboratory Evaluation

11. All dyspeptic patients should have the following initial basic tests:
   - Stool microscopy and culture
   - Abdominal ultrasonography

Further management would be determined by three factors: age of patient, presence of alarm feature(s) and local prevalence of Helicobacter pylori infection.

12. Patients with a presumptive diagnosis of GERD should receive PPI for 8 weeks.

13. Patients on NSAID should discontinue and take PPI for 8 weeks.

14. Patients with alarm features or aged over 40 years should have early endoscopy and treatment instituted as appropriate. Biopsy for Helicobacter pylori should be obtained and eradication therapy given to positive cases.

15. Patients without alarm features and aged 40 years should be tested for H. pylori using urea breath test or stool antigen test and positive cases subjected to eradication therapy (test and treat) because of the high prevalence of H. pylori in Nigeria.

16. Those who continue to have symptoms after eradication therapy should be treated with PPI for 8 weeks.

17. Those who remain symptomatic after this would require endoscopy.

18. Patients whose symptoms have lasted for over 1 year without investigation may be offered early endoscopy.

There is evidence to show that there is improved patient satisfaction and confidence following this line of action.

Patients with Persistent Symptoms

Patients who fail to respond to above strategy would need the following additional actions:

19. Reassessment for type and severity of persisting symptoms.


21. Upper endoscopy, biopsy and testing for H. pylori. Histology should be used for the testing if patient had not previously been tested and culture used if previously tested. Duodenal biopsy may also be done if malabsorption and anaemia are part of patient's presentation.

22. Gastric emptying studies to rule out gastroparesis in patients with persistent nausea and vomiting especially at risk patients like those with diabetes mellitus.

23. Associated large bowel symptoms like diarrhea, constipation and flatulence are indications for colonoscopy.

24. Absence of any organic lesion supports a diagnosis of FD.

Treatment of Functional Dyspepsia (FD)

25. General measures such as smaller, more frequent meals, avoiding caffeine, alcohol, NSAIDs, fatty or spicy foods are usually employed though there is little evidence supporting their use. Patients should be encouraged to adopt these measures if they experience benefit from them.

26. Patients who have EPS-predominant FD should be given PPI initially, followed if necessary by prokinetic agents.

27. Patients who have PDS-predominant FD should receive prokinetic agents, followed if necessary by PPI.

28. Where there is a clear overlap of PDS and EPS, PPI and prokinetic drugs may be combined initially.

29. Patients who fail to respond to the steps stated above should receive antidepressants or anxiolytics.

30. If symptoms persist, refer patient to a gastroenterologist.

Gastroesophageal Reflux Disease

Gastroesophageal reflux disease (GERD) develops when the reflux of gastric contents into the esophagus leads troublesome symptoms and/or complications. Symptoms become troublesome when they adversely affect an individual's wellbeing. Based on this definition GERD can be classified into 2 syndromes (Figure 1).
Fig. 1: Algorithm for management of uninvestigated dyspepsia.

1. H. Pylori test/eradication treatment
2. Symptom persist: PPI
3. Symptom persist: Upper endoscopy
   - Findings do not explain symptoms
   - Findings explain symptoms
   - Organic Dyspepsia
4. Results explain symptoms
   - Excluded GERD and NSAID/drug-induced dyspepsia with history
5. Uninvestigated Dyspepsia
6. Results do not explain symptoms
   - Exclude GERD and NSAID/drug-induced dyspepsia with history
   - Stool m/c/s
   - Abd u/s
This definition is convenient for resource-poor settings because it is patient-centred and symptom-driven, and allows the disease to be diagnosed in primary care on the basis of symptoms alone, without additional deployment of scarce resources in investigations.

**Heartburn and regurgitation** are the characteristic symptoms of GERD.

**Heartburn** is a burning sensation in the retrosternal area. Regurgitation is the perception of flow of refluxed gastric content into the mouth or hypopharynx. Other features of GERD include chest pain, cough, voice changes, repeated need to clear throat, asthmatic attacks, recurrent otitis media, abdominal pain and sleep disturbance.

**Epidemiology**

Gastroesophageal reflux disease is the most common upper gastrointestinal disease in the Western world, with 10-20% of the population experiencing weekly symptoms. Lower prevalence has been reported in Asia. There are no population-based studies in Africa and indeed Nigeria. A questionnaire-based study of medical students in Nigeria showed a prevalence of 26.3%.

Risk factors for GERD include race, sex, age, obesity, alcohol consumption and hiatus hernia, cigarette smoking, and consumption of coffee and cola. Other risk factors include connective tissue disease and chronic obstructive airway disease. Caucasians have higher risk of esophagitis and Barrett's esophagus. Males have higher risk of esophagitis and Barrett's esophagus. These complications also tend to increase with increasing age. Pregnancy is a risk factor for GERD. The prevalence of GERD is increasing globally probably due to aging population, the obesity epidemic and associated changes in diet, physical activity and changes in sleep pattern.

Drugs that may predispose to GERD include anticholinergics, benzodiazepines, calcium channel blockers, dopamine, nicotine, nitrates, theophylline, estrogen, progesterone, glucagon and some prostaglandins.

**Pathophysiology**

The esophagus, lower esophageal sphincter (LES) and stomach can be likened to a simple plumbing circuit. The esophagus functions as an anterograde pump, the LES as a valve, and the stomach as a reservoir. The abnormalities that contribute to GERD can stem from any component of the circuit. A dysfunctional LES allows reflux of large amounts of gastric juice. Delayed gastric emptying can increase volume and pressure in the reservoir until the valve mechanism is overwhelmed, leading to GERD. Esophageal defense mechanisms include esophageal clearance and mucosal resistance. Esophageal clearance has a mechanical arm (esophageal peristalsis) and a chemical component (saliva) both of which limit the amount of time the esophagus is exposed to refluxed gastric juice.

The three dominant pathophysiological mechanisms causing gastroesophageal junction incompetence are: transient lower esophageal sphincter relaxations (tLESRs), a hypotensive LES and anatomic disruption of the gastroesophageal junction, often associated with a hiatal hernia. The dominant mechanism varies as a function of disease severity with tLESR predominating with mild disease and mechanisms associated with LES dysfunction and hiatal hernia predominating with more severe disease.

**Classification**

Non erosive reflux disease (NERD): This is defined by presence of troublesome reflux-associated symptoms and the absence of mucosal breaks at endoscopy. This type of GERD accounts for 60-70% of cases.

Erosive reflux disease (ERD): This is defined endoscopically by visible breaks of the distal esophageal mucosa.

Generally, symptom frequency and/or severity do not accurately predict what the endoscopic findings would be in an individual patient. Patients with upper gastrointestinal symptoms unrelated to reflux of gastric contents are excluded from GERD.

Non erosive reflux disease is the more heterogeneous type of GERD. Impedance-pH technology has helped in defining the subgroups of NERD. All the subgroups have negative upper endoscopy.
Guidelines for the Management of GERD

Fig 2. Algorithm for management of functional dyspepsia

Antidepressant/anticholinergic if refractory

PPI

Prokinetic

PDS

Eradicate H. Pylori if positive

FD

PPI + prokinetic

PDS/EPS Overlap

EPS
**True NERD** is characterized by abnormal esophageal acid exposure at impedance-pH monitoring.

**Acid hypersensitive esophagus** is characterized by normal esophageal acid exposure and positive symptom association to acid reflux at impedance-pH monitoring.

**Nonacid hypersensitive esophagus** is characterized by normal esophageal acid exposure and positive symptom association to non-acid reflux at impedance-pH monitoring.

**Functional heartburn** is not part of NERD spectrum as there is no underlying reflux of gastric contents. There is normal esophageal acid exposure, negative symptom association to any type of reflux at impedance-pH monitoring and non-response to PPI.

Previously, patients with non-acid reflux were grouped under functional heartburn if they failed to respond to PPI (Rome III). Impedance-pH technology has made it possible to isolate the non-acid hypersensitive esophagus group which clearly falls under NERD because they exhibit positive symptom association to reflux, even though PPIs do not lead to amelioration of the symptoms.

**Diagnosis**

There is no gold standard for the diagnosis of GERD. Modalities available to the clinician include history, radiology, upper gastrointestinal endoscopy, histology, PPI test and ambulatory pH monitoring (with or without impedance). An objective diagnostic tool with acceptable sensitivity and specificity remain an unmet need for clinicians and researchers.

Heartburn and regurgitation are characteristic symptoms of the typical reflux syndrome. In the absence of alarm features, the typical reflux syndrome can be diagnosed on the basis of characteristic symptoms alone. This is consistent with the Montreal consensus and suites resource-limited settings.

**Alarm Symptoms**

These are symptoms which raise a strong suspicion of malignant disease or complication. They include:

- Vomiting
- Gastrointestinal bleeding
- Anemia
- Abdominal mass
- Unexplained weight loss
- Progressive dysphagia

2. Radiology as a diagnostic tool is discouraged because of low sensitivity and specificity. It is useless in the diagnosis of NERD.

3. Endoscopy has a high specificity. However, majority of GERD patients are actually endoscopy-negative (NERD).

4. The Los Angeles classification should be used in the endoscopic characterization of reflux esophagitis. This model has gained genuine acceptance over the last 20 years.

5. Routine biopsies from the distal esophagus are not recommended specifically to diagnose GERD.

6. Screening for Helicobacter pylori is not recommended in GERD.

7. Ambulatory pH monitoring is the best method of evaluating NERD patients who do not respond to PPI.

8. Multi-channel intraluminal impedance monitoring with pH sensor (MII-pH) can detect all types of reflux, (including acidic, weakly acidic, and weakly alkaline).

9. Manometry has no place in the diagnosis of GERD. Its use is limited to exclusion of motility disorders of the esophagus and in the preoperative assessment of candidates for anti-reflux surgery. It may also localize the LES for subsequent pH monitoring.

**TREATMENT**

**Goals of Treatment:**

- Relief of symptoms
- Healing of esophagitis
- Prevention of recurrence
- Prevention of complications

**Lifestyle Modification**

10. Weight loss is recommended for GERD patients who are overweight or obese

11. Nocturnal symptoms are an indication for head of bed elevation
12. Foods like chocolate, caffeine, alcohol, acidic and/or spicy food may be avoided if they precipitate/worsen patient's symptoms.

Drugs
13. PPI for 8 weeks is the preferred treatment for healing of esophagitis and relief of symptoms.
14. PPIs are equally effective in erosive esophagitis and NERD.

A functional test is used to isolate patients with acid reflux, non acid reflux and functional heartburn\textsuperscript{23}.
15. Patients who do not respond to PPI in proper dosage and adequate duration should be referred for evaluation.
16. Maintenance treatment is recommended for patients in whom symptoms resume upon discontinuation of PPI.
17. Bedtime H2-receptor antagonist therapy can be added to daytime PPI therapy in selected patients with objective evidence of night-time if needed.
18. Antacids and alginates may be used for symptomatic relief but not for healing of esophagitis.

APPROACH TO PATIENTS WITH GERD
Patients who present with typical symptoms of GERD (heartburn and/or regurgitation) with or without atypical symptoms should be evaluated for the presence of alarm symptoms.
19. The presence of alarm symptoms qualifies them for prompt endoscopy.
20. Those who do not have alarm symptoms should receive PPI.
21. Lack of response warrants a search for other etiologies with upper gastrointestinal endoscopy (for patients with typical symptoms) or other investigations in appropriate specialties depending on the nature of the atypical symptoms.
22. If no abnormality is found, pH-impedance monitoring would be indicate; but where this facility is not available, further management will be determined by the predominant symptom (heartburn or regurgitation), using pain modulators and inhibitors of transient lower esophageal sphincter relaxation (figure 2)

SURGERY
23. Surgery is a treatment option but should not be encouraged in centers without adequate facilities, personnel and requisite experience in the standard procedures.
24. Patients who do not respond to PPI are not candidates for surgery.
25. Patients with erosive esophagitis do not require preoperative pH-monitoring.
26. Patients with NERD must have pH-monitoring prior to surgery.
Surgical therapy is as effective as medical therapy when performed by competent surgeons in carefully selected patients\textsuperscript{34}.

ADVERSE EFFECTS OF PPI
27. Adverse effects associated with short term use include headache, diarrhea and dyspepsia, which occur in less than 2% of users and are generally mild. Chronic use of PPI has been linked to certain complications arising from nutrient malabsorption and susceptibility to infections (due to prolonged acid suppression) and drug-drug interaction.
28. Patients with known osteoporosis can remain on PPI except there are other risk factors for hip fracture.
29. PPI therapy may predispose to Clostridium difficile infection\textsuperscript{35}.
30. Community acquired pneumonia is a recognized risk of short-term PPI use, but not long-term use\textsuperscript{36}.
31. Concomitant users of clopidogrel do not need to alter their PPI therapy\textsuperscript{37}.

Extraesophageal Syndromes
32. GERD may be associated with chronic cough, chronic laryngitis and asthma\textsuperscript{4,39,40}. However, these associated extraesophageal conditions are often multifactorial.
33. In the absence of heartburn or regurgitation, unexplained asthma and laryngitis are unlikely to be related to GERD 40-42.

34. A PPI trial is recommended to treat extraesophageal symptoms in patients who also have typical symptoms of GERD.

35. Medical and surgical treatment trials aimed at improving presumed reflux cough, reflux laryngitis, and reflux asthma syndromes by treating GERD are associated with uncertain and inconsistent treatment effect.

36. Reflux monitoring should be considered before a PPI trial in patients with extraesophageal symptoms who do not have typical symptoms of GERD.

Refractory GERD

Various factors affect response to PPI in GERD, including symptom frequency and severity and PPI dosing regime (once or twice daily) and correctness of diagnosis. Although there is no established consensus regarding the definition of refractory GERD in terms of symptom burden, degree of therapeutic response and PPI dose at which failure occurs, it is reasonable to accept that refractory GERD is a patient-driven phenomenon.

37. Patients with GERD are named refractory to PPI when they do not respond to PPI standard dose BID.

Potential causes may be gastrointestinal or extra-gastrointestinal. The gastrointestinal causes may or may not be reflux-related.

The main causes of reflux-related treatment failure include:

(a.) Acid Reflux: These include incorrect medication dose timing, medication non-compliance, residual pathological acid secretion, rapid PPI metabolism, a hypersecretory state, a significant anatomic abnormality like a large hiatal hernia, excess reflux during tLESR of defective esophageal mucosal barrier function.

(b.) Non Acid Reflux: from stomach or duodenum e.g. bile

Reflux of normal amounts of weakly acidic or alkaline contents into a hypersensitive esophagus

Approach to Patient with Refractory GERD:

38. Optimize PPI therapy

39. Upper endoscopy if symptoms are typical or if dyspeptic symptoms also present

40. Assessment of other etiologies if extraesophageal symptoms are present

41. Ambulatory reflux monitoring

42. Additional anti-reflux therapy for patients with objective evidence of on-going reflux e.g. surgery, TLESR inhibitors like Baclofen.

Gastroesophageal Reflux Disease in Pregnancy

Gastroesophageal reflux disease is common during pregnancy, affecting as much as 80% of pregnant women in some populations 43-45. Proposed mechanisms for this observation include reduced lower esophageal sphincter (LES) pressure probably due to increased progesterone levels, abnormal gastric emptying and delayed small bowel transit 43. The condition is usually short-lived and resolves after delivery and complications are rare 43.

43. The preferred and safest initial treatment for GERD during pregnancy is lifestyle modification through such measures as avoidance of food triggers, elevation of head of bed, avoidance of tight-fitting clothing and chewing gum, avoiding smoking, waiting for 2-3 hours after the last meal before lying down and avoiding medications that can aggravate symptoms.

Chewing gum stimulates salivary glands to secrete saliva which helps to neutralize acid. Lifestyle modifications may control mild symptoms, but drug therapy may be necessary if symptoms are not relieved by these measures.

44. If symptoms fail to abate on lifestyle modifications, calcium and magnesium antacids are considered safe in pregnancy and may be prescribed in recommended doses. Antacid use has not been shown to be unsafe, but there have been no controlled studies 46. Despite the limited data, experts have agreed that antacids should be the first pharmacological treatment for heartburn during pregnancy 47. Antacids provide fast and effective relief, and up to half of women will require only antacids to control GERD 43. High doses of aluminum-containing antacids
Fig. 3: Algorithm for treatment of GERD

1. **Guidelines for the Management of GERD**

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   **Algorithm for treatment of GERD**

   - **Trizodone**
     - **SSRIs**
     - **TCAs**
   - **Pain modulation**
     - **H2a at bedtime**
     - **Heartburn-predominant**
   - **Impedance – NO access to pH**
     - **Heartburn**
   - **Heartburn-predominant**
     - **Impedance**
   - **Normal**
     - **Exclude other etiologies**
     - **Review and compliance**
     - **Review dis disp. timing**
     - **PPI once dy for 2 months**
     - **No alarm features**
     - **Typical symptoms with or without typical symptoms**
     - **Typical symptoms**
     - **Specific**
   - **Functional**
     - **Biopsy**
     - **Upper endoscopy**
     - **Normal**
     - **Symptoms**
     - **ENT, pulmonary, allergy**
     - **Cardiologist**
     - **Acidic reflux**
     - **Regurgitation**
     - **Eosophageal**
     - **Eosophagitis**
     - **Eosophagal**
     - **Treatment**
     - **H2a at bedtime**
     - **Heartburn**
     - **Review dis disp. timing**
     - **PPI once dy for 2 months**
     - **No alarm features**
     - **Typical symptoms with or without typical symptoms**
     - **Typical symptoms**
     - **Specific**
   - **Failure**
     - **Failure**
     - **Failure**
     - **Failure**
may increase aluminum levels in women and cause fetal harm.\textsuperscript{43,47,48}

Acid suppressants (H2-receptor antagonists and proton pump inhibitors) may be used after a careful risk-benefit analysis by the physician.

**Complications of GERD**

Complications of GERD include erosive esophagitis, stricture and Barrett's esophagus. Barrett's esophagus is the only complication of GERD with malignant potential. It is associated with long duration of symptoms, age over 50 years, male sex and Caucasian race. Barrett's esophagus appears to be rare in Nigerian patients.

**RECOMMENDED AREAS FOR FURTHER RESEARCH**

1. Population-based epidemiological studies on dyspepsia and GERD with emphasis on prevalence, age and gender distribution and clinical course.
2. Well-designed studies to determine the ideal cut-off age for early endoscopy in dyspeptic patients.
3. Studies to determine the exact roles of roles of PDS and EPS as well as the role of symptoms other than PDS and EPS in dyspepsia and incorporation of such into the definition of dyspepsia. This is because differences in culture and language may engender differences in interpretation of dyspeptic symptoms.
4. Similarly, heartburn may be influenced by the type of reporting by the patients because of sociocultural issues and lack of appropriate terminology in some local languages.
5. Studies to determine the significance of certain endoscopic findings that appear "flimsy" and considered insufficient to account for observed dyspeptic symptoms.
6. Similarly, the significance of minimal esophagitis or esophageal lesions that fall below Los Angeles Grade A needs to be elucidated in Nigerian patients.
7. The role of Helicobacter pylori in Nigerian patients with FD needs further study.
8. The usefulness of PPI in Nigerians with FD needs to be elucidated.
9. This guideline should be revised on 4-yearly basis as new knowledge emerges from research.

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