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Integrating Gastrointestinal and Dental Management in Analgesic-Associated Dyspepsia

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Abstract

Dyspepsia is a prevalent gastrointestinal disorder that manifests as epigastric pain, nausea, bloating, postprandial discomfort, and burning sensations in the upper abdomen, often triggered by irregular eating patterns, stress, or the consumption of irritant foods and beverages such as coffee, spicy meals, and fatty products, but it can also be induced by prolonged use of non-steroidal anti-inflammatory drugs (NSAIDs). In Indonesia, self-medication with analgesics remains widespread, yet its impact on dyspepsia in primary care settings is rarely documented, making this study relevant to highlight the clinical features and therapeutic management of drug-induced dyspepsia. A 39-year-old woman presented to Way Halim II Primary Health Center in Bandar Lampung with persistent nausea, vomiting, epigastric pain, bloating, and retrosternal burning after consuming sodium diclofenac daily for three months to relieve untreated dental pain, combined with frequent coffee intake. Endoscopic and laboratory findings were normal, while dental radiography revealed an impacted molar, indicating the underlying source of chronic analgesic use. Clinical data were obtained through anamnesis, physical examination, laboratory evaluation, and imaging, and management consisted of proton pump inhibitor therapy (omeprazole 20 mg), prokinetic agents (domperidone 10 mg), and lifestyle modification, including avoidance of dietary triggers. The patient was advised to undergo dental extraction to eliminate the primary cause of analgesic dependence but declined due to procedural anxiety. Following therapy, symptoms improved significantly, with reduced nausea and epigastric discomfort, demonstrating the effectiveness of pharmacological intervention combined with behavioral modification. This study emphasizes the novelty of identifying dyspepsia linked to prolonged unsupervised NSAID use in a primary care context, underscoring the importance of early recognition of drug-induced gastrointestinal disorders, patient education on the risks of self-medication, and multidisciplinary management that integrates gastrointestinal and dental care. Such an approach is critical to prevent recurrence, improve patient outcomes, and strengthen primary health care responses to common but neglected conditions in resource-limited settings.

1. Introduction

Dyspepsia is a clinical syndrome encompassing a constellation of upper gastrointestinal symptoms, including epigastric pain or discomfort, early satiety, postprandial fullness, bloating, nausea, and burning sensations in the upper abdomen. These symptoms may present acutely or chronically and are influenced by multiple etiological factors such as stress, Helicobacter pylori infection, prolonged use of nonsteroidal anti-inflammatory drugs (NSAIDs), dietary habits, and gastrointestinal motility disorders (Mahadeva, 2016; Talley & Ford, 2015). Clinically, dyspepsia is classified into two broad categories: organic dyspepsia, when structural abnormalities such as peptic ulcers or malignancies are identified, and functional dyspepsia, when symptoms occur without detectable organic pathology on diagnostic examination. Functional dyspepsia is particularly challenging, as it requires exclusion of organic causes and often overlaps with other gastrointestinal disorders (Ford et al., 2015).

Although dyspepsia is sometimes perceived as a minor complaint, its impact on quality of life is substantial. Patients often experience reduced productivity, impaired daily functioning, and psychological distress due to persistent symptoms. Chronic dyspepsia can also lead to increased health care utilization, thereby contributing to the economic burden on health systems (Moayyedi & Talley, 2019). Globally, the prevalence of dyspepsia ranges between 13% and 40% annually, according to the World Health Organization (WHO). This wide variation reflects differences in diagnostic criteria, population characteristics, and environmental factors. Meta-analyses confirm that uninvestigated

dyspepsia remains highly prevalent worldwide, with significant regional differences (Ford et al., 2015). In Indonesia, dyspepsia is consistently reported among the top ten most common diseases in outpatient and inpatient settings (Suryati, 2019).

Data from the Basic Health Research (Riskesdas) in 2018 revealed that dyspepsia ranked 10th among the most common causes of hospitalization, accounting for 1.52% of cases (34,029 patients). By 2019, the burden had increased, with dyspepsia rising to 5th place among inpatient diseases. Gender distribution showed higher prevalence in females (61.18%) compared to males (38.82%), suggesting possible hormonal or behavioral influences (Kementerian Kesehatan, 2018; 2019). Outpatient statistics further highlight the magnitude of the problem, with 34,981 male and 53,618 female cases reported in 2019, totaling 88,599 new cases and 163,428 visits. These figures underscore the persistent demand for effective diagnostic and therapeutic strategies in primary care.

At the provincial level, Lampung has reported dyspepsia as one of its most prevalent conditions. In 2022, the Lampung Provincial Health Office documented 2,835 cases, ranking dyspepsia as the second most common disease in the region (Dinkes Provinsi Lampung, 2022). This local data reflects the broader national trend and emphasizes the need for targeted interventions. Pathophysiologically, dyspepsia arises from complex interactions between gastric acid secretion, mucosal integrity, and neurohormonal regulation. Consumption of spicy foods, acidic meals, or fatty diets can exacerbate symptoms by stimulating excessive gastric acid production. Carbonated beverages and caffeine increase gastrin secretion, further elevating acid levels and contributing to mucosal irritation (Fithriyana, 2018; Moayyedi et al., 2006).

Beyond dietary triggers, demographic and psychosocial factors play a significant role. Women are more susceptible to dyspepsia, possibly due to hormonal influences and higher rates of health-seeking behavior. Elderly individuals are also at greater risk, reflecting age-related changes in gastrointestinal physiology. Stress, particularly chronic psychological stress, has been shown to increase gastric acid secretion and impair mucosal defenses, thereby exacerbating symptoms (Wibawani, 2021; Aydin et al., 2020). The role of Helicobacter pylori infection remains central in the pathogenesis of dyspepsia. This bacterium disrupts gastric mucosal integrity, induces inflammation, and alters acid secretion, contributing to both organic and functional dyspepsia. Eradication therapy has been shown to improve symptoms in many patients, highlighting the importance of accurate diagnosis and appropriate treatment (Talley & Ford, 2015).

NSAID use is another critical factor. Prolonged consumption of analgesics such as diclofenac or ibuprofen can damage the gastric mucosa, reduce prostaglandin synthesis, and increase susceptibility to dyspepsia. International studies confirm that NSAID-associated gastrointestinal complications remain a major clinical concern, particularly in patients with chronic pain syndromes (van de Laar et al., 2023; Moayyedi & Talley, 2019). Functional dyspepsia, despite lacking structural abnormalities, is associated with altered gastric motility, visceral hypersensitivity, and psychosocial stressors. These mechanisms highlight the multifactorial nature of the disease and the need for holistic management approaches that address both physiological and psychological dimensions (Wauters et al., 2021).

The burden of dyspepsia extends beyond clinical symptoms. Patients often experience reduced work productivity, absenteeism, and impaired social functioning. In resource-limited settings, inadequate access to diagnostic tools such as endoscopy further complicates management, leading to underdiagnosis and undertreatment (Talley & Ford, 2015). Given the high prevalence and multifactorial etiology of dyspepsia, primary health care facilities play a pivotal role in early detection and management. Integrating pharmacological therapy with lifestyle modification, dietary counseling, and psychosocial support is essential to improve outcomes. Proton pump inhibitors and prokinetic agents remain the cornerstone of therapy, with evidence supporting their efficacy in functional dyspepsia (Suzuki et al., 2011; Cochrane Gut Group, 2017).

This study aims to explore the clinical features of dyspepsia associated with long-term analgesic use and to evaluate therapeutic strategies that integrate gastrointestinal and dental management in a primary care setting. By documenting this case within the Indonesian context, the research seeks to highlight the risks of unsupervised NSAID consumption, emphasize the importance of multidisciplinary care, and contribute to the development of more effective, holistic approaches for dyspepsia management. It is expected that the findings will raise awareness among clinicians and policymakers, encourage patient education on safe medication practices, and ultimately improve quality of life for individuals affected by dyspepsia.

2. Materials and Methods

This study was conducted at Way Halim II Primary Health Center, Bandar Lampung, Indonesia, using a descriptive clinical design with a holistic diagnostic framework. The approach integrated personal, clinical, and functional aspects to capture the multidimensional impact of dyspepsia associated with long-term analgesic use.

2.1. Study Design and Setting

The research was carried out in a primary health care facility, emphasizing real-world clinical practice where patients often present with overlapping gastrointestinal and dental complaints. The descriptive design was chosen to document clinical features, therapeutic interventions, and patient outcomes in detail.

2.2. Patient Selection

The subject was a 39-year-old female presenting with persistent nausea, vomiting, epigastric pain, bloating, and burning sensations in the chest. Inclusion criteria were: (1) adult patient (>18 years), (2) presence of dyspeptic symptoms for ≥3 months, (3) history of prolonged analgesic use, and (4) willingness to undergo diagnostic evaluation. Exclusion criteria included: (1) history of chronic gastrointestinal disease, (2) prior gastric surgery, and (3) current use of gastroprotective agents before presentation.

2.3. Data Collection Procedures

- Anamnesis: Detailed history of presenting complaints, medication use, dietary habits, psychosocial stressors, and lifestyle factors.
- Physical Examination: Vital signs, systemic evaluation, and abdominal inspection/palpation.
- Dental Examination: Inspection of gingiva and teeth, supported by dental radiography to identify underlying pathology.

- Endoscopic Evaluation: Performed to rule out organic abnormalities such as gastritis, ulcers, or malignancy.
- Laboratory Tests: Basic hematology and biochemistry to exclude systemic disease.

2.4. Holistic Diagnostic Framework

Three dimensions were assessed:

- Personal aspect – patient's expectations, motivation for seeking care, and psychosocial background.
- Clinical aspect – gastrointestinal symptoms, medication history, and potential triggers.
- Functional aspect – impact of symptoms on daily activities, sleep quality, and productivity.

2.5. Intervention Strategy

Management combined non-pharmacological and pharmacological approaches:

- Non-pharmacological: Patient education on dietary modification, avoidance of trigger foods/beverages (coffee, spicy, fatty meals), cessation of over-the-counter analgesics, stress management, and deep-breathing relaxation techniques.
- Pharmacological: Proton pump inhibitor (omeprazole 20 mg daily) and prokinetic agent (domperidone 10 mg daily) to reduce gastric acid secretion and improve motility.

2.6. Follow-Up and Monitoring

The patient was monitored for symptom improvement, adherence to therapy, and lifestyle changes. Outcomes were assessed through patient self-report, clinical evaluation, and functional assessment of daily activity and sleep quality. Findings were analyzed descriptively, focusing on the relationship between prolonged analgesic use and dyspeptic symptoms, therapeutic response to pharmacological and lifestyle interventions, and barriers to definitive dental management.

3. Results and Discussion

The patient, Mrs. R, a 39-year-old woman, presented with persistent nausea and vomiting for approximately three months, accompanied by epigastric pain, postprandial fullness, bloating, and a burning sensation in the chest. Symptoms were aggravated particularly when the stomach was empty or after drinking coffee. Based on anamnesis, the primary trigger was identified as repeated use of over-the-counter analgesics, specifically sodium diclofenac, for untreated dental pain. These clinical features are consistent with dyspepsia, particularly NSAID-induced dyspepsia, which is well documented in the literature (Moayyedi & Talley, 2019; van de Laar et al., 2023).

Physical examination revealed stable vital signs and normal systemic findings. BMI was 22.9, categorized as normal. Dental evaluation showed slight gingival hyperemia, while radiography identified an impacted right posterior molar. Endoscopic examination revealed normal gastric mucosa without inflammation, and laboratory results were within normal limits. These findings excluded organic causes such as peptic ulcer disease or gastritis, supporting the diagnosis of non-ulcer dyspepsia triggered by prolonged NSAID use (Talley & Ford, 2015; Ford et al., 2015).

The patient's symptoms aligned with the clinical characteristics of dyspepsia, including nausea, vomiting, epigastric pain, early satiety, postprandial fullness, decreased appetite, and sleep disturbance due to nocturnal discomfort. Risk factors identified included prolonged self-medication with NSAIDs, irregular eating habits, consumption of spicy and acidic foods, coffee intake, and mild stress related to unresolved dental pain. Lack of awareness regarding the adverse effects of unsupervised analgesic use further contributed to the persistence of symptoms. Similar risk profiles have been reported in functional dyspepsia patients globally (Aydin et al., 2020; Talley & Ford, 2015).

Pathophysiologically, dyspepsia in this case was associated with increased gastric acid secretion and reduced mucosal protection due to prostaglandin inhibition from NSAID use. This mechanism leads to gastric irritation, activation of nociceptive receptors, and visceral hypersensitivity, resulting in epigastric pain and burning sensations. Gastric stasis and motility disturbances contributed to early satiety and postprandial fullness. These mechanisms are consistent with established models of NSAID-induced gastrointestinal dysfunction (Moayyedi et al., 2006; Wauters et al., 2021).

Differential diagnoses considered included gastroesophageal reflux disease (GERD), peptic ulcer disease, gastritis, and pancreatitis. However, the strong history of repeated NSAID use and typical burning epigastric symptoms supported mucosal irritation-induced dyspepsia as the most appropriate working diagnosis. Complications of untreated dyspepsia may include erosive gastritis, peptic ulcer disease, nutritional disturbances due to decreased appetite, and psychological effects such as anxiety and sleep disorders. Severe complications, although rare, include upper gastrointestinal bleeding. Early treatment and avoidance of triggers are critical to preventing progression (Talley & Ford, 2015; Moayyedi & Talley, 2019).

Pharmacological therapy with omeprazole 20 mg and domperidone 10 mg was initiated, combined with lifestyle modification and patient education. The patient was advised to avoid trigger foods and beverages, maintain regular meals, and discontinue over-the-counter analgesics. Following intervention, the patient reported gradual improvement: nausea and vomiting decreased, epigastric pain subsided, and burning sensations diminished. These outcomes align with international evidence supporting the efficacy of proton pump inhibitors and prokinetic agents in functional dyspepsia management (Suzuki et al., 2011; Cochrane Gut Group, 2017; Nugroho et al., 2025).

4. Conclusions

Dyspepsia remains a prevalent gastrointestinal disorder with multifactorial etiology, ranging from dietary habits and psychosocial stressors to pharmacological triggers such as prolonged NSAID use. In this study, the clinical presentation of a 39-year-old female patient highlighted the

significant role of repeated self-medication with sodium diclofenac in precipitating persistent dyspeptic symptoms. Despite normal endoscopic and laboratory findings, the constellation of nausea, vomiting, epigastric pain, postprandial fullness, bloating, and burning sensations in the chest strongly supported a diagnosis of functional dyspepsia induced by chronic analgesic consumption. The novelty of this case lies in its documentation within a primary health care setting in Indonesia, where self-medication practices are widespread and often unregulated. The findings emphasize the importance of recognizing NSAID-induced dyspepsia as a distinct clinical entity, particularly in resource-limited contexts where patients frequently rely on over-the-counter medications without medical supervision. This underscores the need for heightened awareness among clinicians and patients regarding the gastrointestinal risks of unsupervised analgesic use. Therapeutic intervention combining proton pump inhibitors (omeprazole) and prokinetic agents (domperidone), alongside lifestyle modification and patient education, resulted in significant symptomatic improvement. However, the persistence of dental pain and the patient's refusal to undergo extraction highlight the necessity of integrating dental management with gastrointestinal therapy. Without addressing the underlying cause of analgesic dependence, recurrence of dyspeptic symptoms remains likely. This finding reinforces the value of multidisciplinary care, bridging gastroenterology and dentistry, to achieve sustainable outcomes. From a public health perspective, this study contributes to the growing body of evidence that functional dyspepsia is not merely a benign condition but one that can impair quality of life, productivity, and psychological well-being. Early recognition, patient education, and trigger avoidance are critical to preventing progression to more severe complications such as erosive gastritis, peptic ulcer disease, or gastrointestinal bleeding. The prognosis is generally favorable if patients adhere to therapy and eliminate causative factors, but poor compliance may lead to chronicity. In conclusion, dyspepsia associated with long-term analgesic use represents a preventable condition that requires both clinical vigilance and patient empowerment. Integrating gastrointestinal and dental management within primary care offers a novel and practical approach to reducing recurrence, improving patient outcomes, and strengthening community health systems. Future research should explore larger cohorts to validate these findings and assess the scalability of multidisciplinary interventions in diverse populations.

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Informed Consent Statement: Written informed consent has been obtained from the patient's guardian to publish this case report, including clinical details and images.

Data Availability Statement: All data supporting the findings of this study are contained within the article. No additional datasets were generated or analyzed.

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Conflicts of Interest: All the authors declare that there are no conflicts of interest.

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