



A REVIEW ON DRUG-INDUCED OESOPHAGEAL DISORDERS: PATHOGENESIS, INCIDENCE, PREVENTION AND MANAGEMENT

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ABSTRACT

Drug-induced oesophageal problems are an important clinical issue since they can cause severe pain and consequences. The goal of this study is to offer a thorough examination of the etiopathogenesis, epidemiology, and treatment of these conditions. According to epidemiology, the frequency of drug-induced oesophageal injuries is rising, especially in groups that use medications often, such the elderly and people with long-term illnesses. The pathophysiology encompasses several pathways, including as systemic effects, direct damage to the mucosa, and particular pharmacological characteristics. Commonly implicated medicines include bisphosphonates, NSAIDs, and some antibiotics. Chest discomfort, odynophagia, and dysphagia are common clinical symptoms that need for extensive diagnostic techniques such radiographic imaging and endoscopy. The use of protective agents, patient education about appropriate administration practices, and cautious drug selection are the main focuses of prevention initiatives. Pharmacological therapies, lifestyle changes, and the cessation or substitution of the offending medication are all part of management. In order to improve patient outcomes and save healthcare costs, this review emphasizes the significance of increased knowledge and proactive approaches in the prevention and management of drug-induced oesophageal diseases.

KEYWORDS: Drug-induced oesophageal disorders, oesophagitis, oesophageal ulcers, drug-related adverse effects, epidemiology, etiopathogenesis, management strategies.

INTRODUCTION

Drug-induced oesophageal diseases are illnesses that affect the esophagus, which is the muscular tube that joins the throat and stomach, and are brought on by or made worse by the use of specific drugs. These conditions can cause more serious harm to the esophagus lining in addition to minor discomfort. The following are the many drug-induced oesophageal disorders.^[1,2]

Types of Drug-Induced Esophageal Disorders

- 1. Drug-Induced Esophagitis:** This is an inflammatory condition of the esophagus brought on by an allergic response or irritation to certain drugs. NSAIDs (non-steroidal anti-inflammatory drugs), tetracycline antibiotics, bisphosphonates (used to treat osteoporosis), and potassium chloride pills are common offenders.
- 2. Drug-Induced Ulcers:** Certain drugs have the direct ability to induce esophageal ulcers. These erosive ulcers may hurt, make swallowing painful, or bleed. NSAIDs and potassium chloride pills are two examples.

- 3. Drug-Induced Strictures:** Prolonged esophageal inflammation or damage can result in the production of scar tissue, which narrows the esophagus and causes strictures. Swallowing meals and liquids may become challenging as a consequence. NSAIDs and certain antibiotics are frequently mentioned among the drugs in question.
- 4. Drug-Induced Dysmotility:** Some drugs can interfere with the esophagus's regular muscular contractions, or peristalsis, which can result in dysmotility problems. Symptoms like dysphagia, or trouble swallowing, or regurgitation of food might arise from this.
- 5. Drug-Induced Perforation:** Rarely, serious drug-induced esophageal damage can result in an esophageal wall perforation, which is a medical emergency needing prompt attention.^[3,4,5]

Scope and Importance

Comprehending esophageal issues caused by drugs is essential for several reasons:

- **Patient Safety:** By being aware of these conditions, medical professionals may inform patients about the possible side effects and hazards of specific drugs.
- **Clinical Management:** Prompt identification of esophageal issues caused by drugs helps avert complications and direct suitable therapeutic approaches. This might entail starting supportive treatment and stopping the problematic drug.
- **Drug Development:** In order to guarantee patient safety, pharmaceutical firms and government authorities must be aware of potential esophageal adverse effects throughout medication development and post-marketing surveillance.
- **Research and Education:** Better preventative measures and better patient outcomes may result from further investigation into the processes behind drug-induced esophageal problems.^[6,7]

EPIDEMIOLOGY

Drug-induced oesophageal disorders are relatively common but their prevalence and incidence can vary based on geographic region, specific populations, and the types of medications used. Here's a summary of the epidemiological data in numeric statistics format where available:

Global Prevalence and Incidence

1. **Prevalence:** Drug-induced oesophageal problems are known to often cause oesophageal damage, although their precise prevalence is not well-documented in comprehensive data worldwide.
2. **Incidence:** Depending on the demographic and the kinds of drugs used, incidence rates differ significantly. For example:
 - Drug-induced ulceration and esophagitis: Its annual global incidence is estimated to be between 3.9 and 10 cases per 100,000 people..
 - Pill-induced esophagitis: With an estimated frequency of 3 to 10 cases per 100,000 individuals annually, this condition accounts for a substantial fraction of cases.

Regional Variations

1. **North America and Europe:** These two locations often have greater rates because they consume more NSAIDs and bisphosphonates, two drugs known to induce oesophageal damage.
2. **Asia:** The use of herbal medicines and certain traditional treatments may also be a factor in drug-induced oesophageal diseases in various Asian nations.

Population-Specific Incidence Rates

1. **Elderly Population:** Polypharmacy and age-related alterations in esophageal motility and swallowing make elderly people more vulnerable. In this age range, the annual incidence rate might reach 30 cases per 100,000 people.
2. **Patients with Specific Conditions:** Patients who have long-term medication-requiring diseases (such

osteoporosis or chronic pain) are more vulnerable. For instance, the incidence of esophageal adverse events might be as high as 10 occurrences per 100,000 person-years in osteoporosis patients on bisphosphonates.

3. **Psychiatric Patients:** Due to variables including decreased salivary flow and altered esophageal motility, patients with psychiatric problems frequently use drugs that may cause drug-induced esophageal abnormalities.

These figures give a comprehensive picture of the incidence and prevalence of drug-induced oesophageal diseases, emphasizing their worldwide reach and disparate rates among various demographics and geographical areas.^[8,9,10]

ETIOPATHOGENESIS

It is important to comprehend how drugs interact with the esophagus mucosa to determine the etiopathogenesis of drug-induced oesophageal illnesses.

Usually, an inflammatory cascade is set off by the first insult to the esophagus mucosa, which might be caused by a chemical reaction, a mechanical blockage, or delayed transit. If the damage is severe or long-lasting, this inflammation may worsen into an ulcer, with the possibility of strictures developing as a consequence. The following provides a thorough discussion of the elements that contribute to various disorders:

1. Direct Chemical Irritation

Because of their chemical makeup, several drugs have the potential to directly irritate the esophagus mucosa. Inflammation, erosion, ulceration, and in extreme situations, stricture development, can result from this stimulation. Important elements consist of:

- **Acidic or Alkaline Properties:** Drugs with extremely high or low pH levels might result in esophageal burns and ulcers. As an illustration:
 - **NSAIDs:** Because nonsteroidal anti-inflammatory medications, like ibuprofen, are acidic, they can cause direct harm to the esophageal epithelium when they come into touch with it.
 - **Potassium Supplements:** Similar harm can be caused by alkaline materials such as potassium chloride pills.
- **Osmotic Effects:** Through osmotic processes, solid dose forms that absorb water in the esophagus might cause local tissue damage. This is especially important while using drugs like potassium pills.

2. Mechanical Factors

- **Size and Shape of Medications:** Large or asymmetrically formed tablets or capsules have the potential to lodge in the esophagus, resulting in ulceration and mechanical damage. Among the elements that might cause a mechanical damage are:

- **Poor Swallowing Technique:** Pills sticking in the esophagus can occur when swallowing medicine improperly or while taking it without enough water.
- **Expansion Upon Contact:** When certain drugs come into touch with liquids, they may swell or expand, which raises the risk of a mechanical harm.

3. Delayed Transit Time and Esophageal Motility Disorders

- **Delayed Esophageal Transit:** Disorders or medicines that slow down the esophageal transit time expose the esophagus mucosa to more potentially dangerous substances, extending the duration of contact and raising the risk of damage.
- **Esophageal Motility Disorders:** Achalasia and scleroderma are examples of conditions that influence esophageal motility. These disorders can make it difficult for drugs to pass through the esophagus, which increases the risk of mucosal damage and prolongs exposure.

4. Local and Systemic Factors

- **Local Irritation and Inflammation:** The esophagus mucosa sustains an initial insult that sets off an inflammatory reaction that may result in further harm and problems.
- **Systemic Absorption and Effects:** Although drugs may not cause esophageal injury directly, their systemic effects may indirectly cause esophageal injury. As an illustration:

- **Increased Gastric Acid Secretion:** Drugs such as NSAIDs can make the stomach more acidic, which aggravates reflux disease and damages the esophagus.

5. Drug-Specific Mechanisms

Because of their chemical makeup or local effects, several drugs are known to be more prone to result in drug-induced esophageal disorders:

- **Bisphosphonates:** These medications, which are used to treat osteoporosis, can seriously damage the esophagus if they are not taken properly and with enough water.
- **Chemotherapy Drugs:** A few chemotherapy medicines have cytotoxic effects that might harm the esophagus mucosa's rapidly dividing cells, resulting in ulceration and mucositis.

6. Patient-Specific Factors

- **Age and Comorbidities:** Patients who are elderly or who have a history of esophageal disorders (such as GERD or Barrett's esophagus) are more vulnerable because of things like decreased esophageal motility and higher drug usage.
- **Polypharmacy:** Individuals who take many drugs at once have a higher chance of experiencing negative side effects and drug interactions, such as esophageal issues brought on by drugs.^[11,12,13,14]

Table 1: Drugs responsible for drug-induced oesophageal disorders.

Drug Class	Examples	Mechanism of Injury
Nonsteroidal Anti-inflammatory Drugs (NSAIDs)	Ibuprofen, Naproxen, Aspirin	Direct mucosal damage (acidic properties), increased gastric acidity leading to reflux and irritation.
Bisphosphonates	Alendronate, Risedronate, Ibandronate	Direct mucosal damage, particularly if not taken with sufficient water and in an upright posture.
Potassium Chloride	Potassium supplements in solid form	Osmotic damage to esophageal mucosa due to high osmolarity.
Iron Supplements	Ferrous sulfate, Ferrous gluconate	Direct mucosal damage and irritation.
Quinidine	Quinidine sulfate	Direct mucosal damage and irritation.
Doxycycline	Tetracycline antibiotics	Direct mucosal damage and irritation.
Vitamin C (Ascorbic Acid)	Ascorbic acid tablets	Acidic properties can cause direct mucosal damage.
Clarithromycin	Macrolide antibiotic	Direct mucosal damage and irritation.
Antiretroviral Medications	Protease inhibitors (e.g., Indinavir)	Direct mucosal damage and irritation.

Table 2: Factors responsible for drug-induced oesophageal disorders.

Factor Category	Specific Factors
Drug-Specific Factors	Chemical Properties
	- Acidic or alkaline pH
	- Osmotic effects
	Mechanical Properties
	- Size and shape
Patient-Specific Factors	Local Irritation
	- Direct mucosal damage
	Physiological Factors
	- Age

	- Underlying esophageal conditions
	- Swallowing disorders
	Behavioral Factors
	- Medication administration practices
Systemic Effects	Increased Gastric Acidity
	Drug Interactions
Dosage and Formulation	Dosage form
	Drug formulation
Patient Education	Adherence to administration instructions

CLINICAL PRESENTATIONS

Depending on the degree and exact kind of esophageal damage, drug-induced oesophageal diseases can exhibit a variety of clinical symptoms and indicators. The clinical presentation typically includes.^[15,16]

Retrosternal pain	Erosive esophagitis
Dysphagia	Hematemesis
Odynophagia	Melena
Heartburn	Weight loss
Regurgitation	Anemia
Chest discomfort	Excessive saliva
Nausea	Halitosis (bad breath)
Vomiting	Globus sensation
Difficulty breathing	Hoarseness
Cough	Sore throat

DIAGNOSIS

A methodical strategy that combines clinical evaluation, patient history, and targeted diagnostic procedures to confirm the existence of medication-induced esophageal damage is necessary for the diagnosis of drug-induced oesophageal diseases. This is a thorough description of the diagnostic procedure:

1. Clinical Assessment

- Examine symptoms such regurgitation, heartburn, dysphagia (difficulty swallowing), odynophagia (painful swallowing), retrosternal discomfort, and indicators of gastrointestinal bleeding (hematemesis, melena). Get a thorough medical history, including any recent additions or modifications that could be connected to esophageal damage.

2. Endoscopic Evaluation

- When it comes to identifying drug-induced esophageal problems, endoscopy is regarded as the gold standard. By directly seeing the esophagus, it is possible to evaluate the integrity of the mucosa and determine whether erosions, ulcers, strictures, or other anomalies are present..

3. Biopsy

- To rule out other sources of esophageal disease or in the presence of worrisome lesions. Biopsies from regions of aberrant mucosa may be obtained during endoscopy for histological evaluation in order to rule out other illnesses such infectious esophagitis or cancer and confirm drug-induced harm.

4. Barium Swallow

- After the patient drinks a barium contrast agent, X-rays are obtained to assess the anatomy and function of the esophagus. It can identify morphological anomalies suggestive of esophageal damage, such as strictures, narrowing, or other abnormalities.

5. Esophageal pH Monitoring

- Helpful in determining if reflux disease of the stomach has a role in esophageal damage. use a pH probe inserted by endoscopy or nasal insertion to measure the amount of acid exposure in the esophagus over the course of 24 hours. This aids in figuring out whether reflux is making mucosal damage worse.

6. Esophageal Manometry

- Assesses the function and motility of the esophagus, especially in individuals whose suspected motility issues are linked to drug retention and damage. evaluates peristalsis and sphincter function along the esophagus to measure pressure fluctuations, which can shed light on esophageal dysmotility.

7. Additional Tests

- Laboratory Investigations:** Liver Function Tests (LFTs) if hepatotoxic medicines are suspected, Complete Blood Count (CBC) to check for anemia or indicators of persistent bleeding.
- Imaging Studies:** If problems like perforation or fistula development are suspected, an MRI or CT scan may be necessary.^[17,18,19,20]

TREATMENT

Drug-induced oesophageal diseases are treated with a mix of non-pharmacological therapy to lessen esophageal irritation and avoid recurrence, pharmacological measures to relieve symptoms and promote healing, and stopping or changing the offending medicines. Below is a summary of several treatment modalities:

1. Discontinuation or Modification of Offending Drugs

- Based on clinical evaluation and diagnostic results (e.g., endoscopy), identify and stop taking drugs that may be causing esophageal damage. If at all feasible, move to a different drug that won't irritate or harm the esophagus. Collaborate with prescribing

physicians to adjust medication regimens while considering alternative therapeutic options.

2. Pharmacological Interventions

- **Antacids**
 - **Mechanism:** Neutralize gastric acid and reduce reflux-induced irritation of the esophageal mucosa.
 - **Examples:** Calcium carbonate, magnesium hydroxide, aluminum hydroxide.
- **Proton Pump Inhibitors (PPIs)**
 - **Mechanism:** Suppress gastric acid production, promoting healing of esophageal mucosal erosions and ulcers.
 - **Examples:** Omeprazole, esomeprazole, lansoprazole.
- **Histamine-2 (H₂) Receptor Antagonists**
 - **Mechanism:** Reduce gastric acid secretion, providing symptomatic relief and supporting healing.
 - **Examples:** Ranitidine, famotidine, cimetidine.
- **Sucralfate**
 - **Mechanism:** Forms a protective barrier over ulcerated or injured mucosa, promoting healing and reducing further damage.
 - **Administration:** Typically administered as an oral suspension.^[21,22,23,24]

3. Non-Pharmacological Therapies

- **Dietary Modifications**
 - **Soft Diet:** Recommend softer foods that are easier to swallow and less likely to cause mechanical irritation.
 - **Avoid Trigger Foods:** Advise avoiding spicy, acidic, or rough-textured foods that can exacerbate esophageal irritation.
- **Lifestyle Changes**
 - **Proper Medication Administration:** Teach patients to avoid reflux and discomfort by taking their prescriptions with a full glass of water and staying upright for at least half an hour.
 - **Smoking Cessation:** Promote quitting smoking since it might exacerbate symptoms of reflux disease.
 - **Weight Management:** Take care of obesity as it might worsen esophageal damage and cause acid reflux.
- **Behavioral Modifications**
 - **Postural Changes:** To lower the risk of reflux, avoid laying down right away after eating or taking medicine.
 - **Meal Timing:** To relax the strain on the lower esophageal sphincter and lessen reflux episodes, promote smaller, more frequent meals.^[25,26]

PREVENTIVE MEASURES

The goal of preventive interventions for drug-induced oesophageal illnesses is to reduce the possibility of medication-induced esophageal harm. These actions center on patient education, medication selection, and administration methods.

1. Drug Selection and Prescription Practices

- **Select Formulations Carefully**
 - When possible, utilize liquid formulations instead of solid dose forms since they are less likely to irritate the throat or become stuck in the esophagus. Select prescriptions with reduced likelihood of having pH extremes that are either acidic or alkaline, as they can irritate the esophageal mucosa directly.
- **Avoid Potentially Irritating Drugs**
 - Be cautious with medications known to cause esophageal injury, such as:
 - **NSAIDs (Nonsteroidal Anti-inflammatory Drugs):** Ibuprofen, naproxen, aspirin.
 - **Bisphosphonates:** Alendronate, risedronate, ibandronate.
 - **Potassium Chloride:** Solid forms of potassium supplements.
 - **Iron Supplements:** Ferrous sulfate, ferrous gluconate.
 - **Tetracycline Antibiotics:** Doxycycline.
 - **Acidic Preparations:** Vitamin C (ascorbic acid) tablets.
 - **Others:** Quinidine, clarithromycin, antiretroviral medications (e.g., protease inhibitors).
- **Consider Patient-Specific Factors**
 - When choosing drugs, take into account the patient's age, any underlying medical diseases (such as GERD or esophageal dysmotility), and any prior esophageal illnesses.^[27,28]

2. Proper Medication Administration

- **Take with Plenty of Water**
 - To ensure that drugs move easily down the esophagus, advise patients to consume them with a full glass (8 ounces) of water. Drinking enough water reduces the possibility of mechanical harm or irritation and ensures that drugs do not become lodged in the esophagus.
- **Remain Upright After Administration**
 - To avoid reflux and lower the risk of aspiration, advise patients to stay upright (either sitting or standing) for at least thirty minutes after taking medicine. This lessens the possibility of acid or drug exposure to the esophagus and helps gravity aid in transferring drugs into the stomach.
- **Avoid Taking Medications Before Bed**
 - To reduce reflux episodes and the ensuing esophageal damage, patients—especially those who are predisposed to reflux—should avoid lying down right away after taking medicine.

3. Patient Education and Counseling

- **Administration Instructions**
 - Clearly explain how to take prescriptions, stressing the need of swallowing with water and staying upright. To guarantee adherence, reiterate these

recommendations in consultations and follow-up visits.

- **Symptom Recognition**

- Inform patients about symptoms that might indicate an esophageal injury, such as heartburn, retrosternal discomfort, dysphagia (difficulty swallowing), odynophagia (painful swallowing), or indications of gastrointestinal bleeding (hematemesis, melena).

- **Adherence Support**

- Address any worries or inquiries patients may have regarding the use of their prescriptions, how they should take them, or any possible adverse effects.
- Increase patient comprehension of the benefits of preventative care in order to encourage involvement in their own treatment.^[29,30,31,32]

Table 3: Preventive Measure.

Drug Selection
Choose formulations wisely
Avoid acidic or alkaline pH drugs
Be cautious with known irritants
Consider patient-specific factors
Proper Medication Administration
Take with plenty of water
Remain upright after administration
Avoid lying down immediately after ingestion
Patient Education and Counseling
Provide clear administration instructions
Emphasize symptom recognition

COMPLICATIONS OF DRUG-INDUCED OESOPHAGEAL DISORDERS

Depending on the severity and duration of the ailment, drug-induced oesophageal problems might result in a variety of issues. These issues might include:

1. Oesophageal Strictures and Stenosis

Extended exposure to irritant medications can result in oesophageal lining inflammation and scarring, which can restrict the oesophagus and produce strictures. Food impaction episodes, regurgitation of food, and dysphagia (difficulty swallowing) can all be caused by oesophageal strictures. In severe situations, surgery or endoscopic dilation may be necessary to relieve discomfort and restore swallowing function.

2. Oesophageal Ulcers

Oesophageal mucosal ulceration can be caused by several medicines, most notably bisphosphonates and NSAIDs (non-steroidal anti-inflammatory drugs). These ulcers can result in problems including bleeding and perforation, and they can cause severe discomfort, especially during swallowing (odynophagia). The usual course of management include stopping the problematic medication and using pharmaceutical therapies to encourage recovery and stop more harm.

3. Barrett's Oesophagus

Barrett's oesophagus is a disease that can occur sometimes as a result of drug-induced oesophageal

problems that cause persistent irritation and inflammation of the oesophageal lining. The typical squamous epithelium of the oesophagus changes into a specialized columnar epithelium that resembles the intestinal mucosa in this situation. Barrett's oesophagus is linked to a higher risk of oesophageal adenocarcinoma, which is a kind of cancer. It is advised to conduct routine surveillance using biopsies and endoscopic exams in order to identify dysplastic alterations early and take appropriate action.

4. Gastroesophageal Reflux Disease (GERD)

Gastric reflux disease (GERD) can result from a weakening of the lower oesophageal sphincter (LES) caused by drug-induced injury to the oesophageal mucosa. Heartburn, regurgitation, and chest discomfort are among the symptoms of gastroesophageal reflux disease (GERD), which is defined by recurrent acid reflux from the stomach into the oesophagus. Prolonged gastroesophageal reflux disease (GERD) has the potential to worsen the inflammation of the oesophagus and lead to the emergence of problems including Barrett's oesophagus and erosive oesophagitis. Treatment options include dietary adjustments, drugs to lower acid production, and occasionally, surgery to reinforce the LES.

5. Oesophageal Perforation

Severe drug-induced oesophageal problems can result in oesophageal wall perforation, especially in individuals with underlying oesophageal pathology or when using strong irritating medications. In order to avoid sepsis and mediastinitis, which is an inflammation of the mediastinal tissues, oesophageal perforation is a medical emergency that has to be treated very once. Intensive supportive care and surgical correction of the perforation are usually part of the treatment.^[33,34,35]

LONG-TERM MANAGEMENT AND FOLLOW-UP

Drug-induced oesophageal diseases require long-term monitoring and care in order to track the remission of acute symptoms, stop them from coming back, and handle any consequences. Several crucial elements are included in this care phase:

Monitoring and Assessment

- **Symptom Resolution:** Assessing the disappearance of acute symptoms such as dysphagia, odynophagia, and chest discomfort is known as "symptom resolution."
- **Endoscopic Evaluation:** Monitoring the healing of the oesophageal mucosa and looking for any persisting ulcers, strictures, or indications of Barrett's oesophagus by the performance of follow-up endoscopies as needed.
- **Functional Assessment:** Making sure that normal swallowing function has been restored by tracking oesophageal motility and function using procedures like manometry.

Pharmacological Management

- **Continuation or Discontinuation of Therapy:** Balancing the risk of oesophageal side effects with the care of the underlying ailment that requires medication therapy.
- **Proton Pump Inhibitors (PPIs):** To control persistent acid reflux and encourage healing, PPI medication may be continued or tapered depending on symptoms and endoscopic results.
- **Mucosal Protectants:** To promote healing and stop more damage, use sucralfate or other mucosal protectants as needed.^[36,37]

Lifestyle Modifications

- **Behavioral Changes:** Teaching patients the value of taking their drugs upright and with plenty of water to reduce oesophageal exposure.
- **Dietary Adjustments:** Offering dietary advice on how to lessen irritation to the oesophageal mucosa, such as avoiding spicy meals and acidic beverages.
- **Smoking Cessation and Alcohol Reduction:** Since alcohol consumption can aggravate reflux and oesophageal irritation, it is recommended to reduce alcohol intake and stop smoking.

Surveillance and Prevention of Complications

- **Regular Follow-Up Visits:** Arranging for recurring check-ups to keep an eye on symptoms, drug compliance, and any side effects.
- **Endoscopic Surveillance:** Conducting recurrent endoscopic exams to check for oesophageal cancer, Barrett's oesophagus, and strictures, among other issues.
- **Patient Education:** Constantly educating patients on the warning signs and symptoms of oesophageal problems, the significance of following doctor's orders, and when to get help if symptoms get worse.

Surgical Intervention

- **Consideration for Intervention:** Assessing whether endoscopic or surgical procedures are necessary when treating patients with chronic strictures or symptoms that do not improve with medication.
- **Oesophageal Dilation:** To treat strictures and enhance oesophageal patency, balloon dilatation or stent implantation are done under endoscopic supervision.

Multidisciplinary Approach

- **Collaborative Care:** This approach combines the expertise of gastroenterologists, primary care physicians, pharmacists, and nutritionists to offer patients with drug-induced oesophageal problems comprehensive care that meets their diverse requirements.

Through individualized treatment plans and continuous assistance, the long-term management and monitoring of drug-induced oesophageal diseases seeks to maximize

patient outcomes, reduce complications, and improve quality of life.^[38,39,40]

CONCLUSION

In summary, the epidemiology, etiopathogenesis, and therapeutic approaches of drug-induced oesophageal diseases have all been well reviewed. Owing to their diverse etiologies and potential for consequences, these illnesses pose a substantial therapeutic challenge. Epidemiologically, the occurrence of these conditions varies among populations, depending on patient demographics and particular drugs. Mechanistically, systemic effects, the chemical makeup of the medications, and direct mucosal injury are the causes of drug-induced oesophageal injuries. This emphasizes the significance of patient-related variables and drug formulation. Management techniques include therapeutic interventions ranging from pharmacological therapies to endoscopic procedures, as well as preventative measures including medication selection and patient education. Monitoring for symptom remission, averting recurrence, and managing problems with customized treatments and routine follow-up are all part of long-term care. In this difficult field of gastroenterology, future research should concentrate on improving patient outcomes, treatment procedures, and diagnostic approaches. Through the advancement of knowledge and application of efficacious management techniques, healthcare practitioners may reduce hazards and enhance the well-being of individuals impacted by drug-induced oesophageal problems.

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