TOBACCO AND THE GASTROINTESTINAL SYSTEM

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Quit Tobacco International, including development of the curriculum, is a team effort, in which individuals have different responsibilities as described below:

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TOBACCO AND THE GASTROINTESTINAL SYSTEM

I. GOAL OF MODULE: Provide students with knowledge and skills about oral diseases and other common abdominal disorders related to tobacco use.

II. TARGET AUDIENCE

a. Level of Student/Learner: Mini-Lecture 1: 1st semester; Mini-Lecture 2: 6th semester
b. Suggested Course or Subject: Mini-Lecture 1: Dental Dept. through Community medicine; Mini-Lecture 2: Gastrointestinal Dept / Surgery

III. LEARNING OBJECTIVES

- To understand how tobacco causes GI diseases.
- To understand the relationship between tobacco use and gastric ulcer, gastro-esophageal reflux, and liver disease.
- To understand the relationship between smoking and constipation.
- To understand how and why to offer tobacco cessation in GI disorders.
- To understand the effects of smoking on the mouth.
- To understand the relationship between oral cancers and pre-cancers, periodontal disease, and dental caries.
- To understand the synergistic effect of smoking and alcohol.
- To understand the effect of smokeless tobacco on oral health.
- To understand how smoking cessation will benefit oral health.

IV. CURRICULUM STANDARDS ADDRESSED:

The Community Medicine Department has the broad goal of teaching students and preparing them to function as community and first level physicians in accordance with institutional goals. It has a total of 20 hours, of which three hours are for non-communicable diseases. Time from this slot can be used for this mini-lecture.

- It provides knowledge of the demographic pattern of the country and appreciates the role of the individual, family, community and socio-cultural mileu in health and disease.
- It also helps in identifying environmental and occupational hazards and their control and understanding the principles of health economics, health administration, and health education in relation to the community.

Skills:

- The students can use epidemiology as a scientific tool to make rational decisions relevant to community and individual patient intervention.
- Students develop capabilities of synthesis between cause of illness in the environment or community and individual health and respond with leadership qualities to institute remedial measures for this.

The Surgery Department has the broad goal of teaching undergraduate medical students in Surgery to become capable of delivering efficient first contact surgical care. It has a total of 180 hours, of which 72 hours are for the gastro-intestinal tract. Time from this slot can be utilized for this mini-lecture.

- It provides knowledge of the aetiology, patho-physiology, principles of diagnosis, and management of common surgical problems in adults and children.
- It describes common malignancies in the country and their management including prevention.

Skills:

- The student will be able to diagnose common surgical conditions both acute and chronic, in adults and children.
- Plan various laboratory tests for surgical conditions and interpret the results.

V. MINI-LECTURES

MINI LECTURE 1: TOBACCO AND COMMON ABDOMINAL DISORDERS

CORE SLIDES

1. How Tobacco Causes GI Diseases
2. Tobacco and Gastric Ulcer
3. Gastro-esophageal Reflux
4. Tobacco and Liver Disease
5. Smoking and Constipation
6. Tobacco Cessation in GI Disorders

OPTIONAL SLIDES

1. Tobacco and Crohn's Disease
2. Tobacco and Gall Stones

MINI LECTURE 2: TOBACCO AND ORAL DISEASES

CORE SLIDES

1. Effects of Smoking on the Mouth
2. Oral Cancers
3. Oral Pre-cancer
4. Periodontal Disease
5. Dental Caries
6. Smoking and Alcohol
7. Betel Quid and Oral Health

8. Benefits of Tobacco Cessation
9. When to Advise on Cessation

OPTIONAL SLIDES

1. Oral Diseases: Pathophysiology
2. Saliva and Implant Survival
3. Other Effects of Smoking
4. Global Incidence: Oral Cancer

VI. CASE DISCUSSION/CLINICAL SCENARIO AND SKILLS CHECKLIST

Case Scenario

Overview

In this module, students are asked to practice integrated communication during case discussion under supervision of instructors in order to develop their smoking cessation skills. Students will be trained to routinely ask about patients' smoking status in every case. After obtaining patients' current smoking status, students will then practice how to assess patients' readiness to quit, advise and assist patients to quit smoking, and also arrange follow ups to monitor patients' smoking cessation progress. Therefore, students will also learn how to deliver efficient encouragement and provide proper explanation about the harm of tobacco on health and to help patients in their smoking cessation attempts.

Introduction

Tobacco has a role in the pathophysiology of oral as well as other non-malignant GI diseases. Apart from initiating oral and GI diseases, smoking also delays gastric/duodenal ulcer and oral implant healing. All this has a bearing on continued use of tobacco as well as on cessation efforts that should be discussed as part of this case.

Learning Objectives

Upon the completion of this skills laboratory practice, students are expected to be able to:

- Routinely ask all the patients about their smoking status
- Assess patients' readiness to quit
- Advise patients with oral and GI diseases to quit smoking
- Assist the patients to quit
- Arrange follow ups on patients' smoking cessation progress
- Explain the harm of tobacco on oral and GI systems

Asking the patients' smoking history

Research studies show that if doctors have a reminder to ask about smoking, e.g. smoking status is part of the vital signs, doctors are three times more likely to advise patients to quit. Simple

advice from a physician has been shown to increase abstinence rates significantly (by 30%) compared to no advice.

There are several important factors that should be considered when we are asking the patients'smoking history, i.e. 1) asking the smoking status of all patients (including women and teenagers); 2) if patient does not smoke, they should be asked if they have ever smoked (because even after quitting, a smoker can start again); 3) questions should be delivered in a non-critical manner; 4) evaluate the patients' smoking history as to how many cigarettes they smoke daily, do they use any other forms of tobacco; and 5) make a note on the patients' smoking status in the medical record. Women and children should not be excluded and they should also be asked about passive smoking.

Case Scenario

A 47 year old man with a history of epigastric burning pain was previously diagnosed to have a gastric ulcer and treated with Omeprazole for two weeks. He is a chronic smoker for the last 15 years and smokes an average of 2 packets per day.

Vital Signs
Blood Pressure: 122/84 mm Hg
Pulse: 75/min
Body Weight: 58 kg
Temperature: 97 F

Smoking Status
Smoking / smokeless use status of patient: Smoker Ex-Smokers Never Smoke (Circle one)
Smoking / smokeless use status of spouse: Smoker Ex-Smokers Never Smoke (Circle one)

Checklist for Case Scenario

S.No.	Aspects	Please tick if student has covered this aspect
	Ask	
	• Ask whether he/she chews tobacco or is exposed to SHS	
	• Ask patient whether he/she smokes or not	
	• If the patient doesn't smoke, ask whether he/she ever smoked before	
	• If the patient smokes, ask how many cigarettes he/she takes per day	
	Advise	
	• Advise patient to quit chewing and avoid SHS	
	• Advise patient to quit smoking	
	• Personalize advice by using the tobacco user's	

	health status/disease	
	Assess	
	• Assess patient's readiness to quit	
	Assist	
	• Assist the patient to quit by giving him/her pamphlets, brochures	
	Arrange for Follow-up	
	• Arrange to follow up on tobacco use	

Points for Discussion

You have an ulcer in the stomach and it is causing heart burn. Smoking is a major cause of stomach ulcers. It will increase the acid in the stomach and this acid will burn the stomach, leading to ulcer and severe abdominal pain. If you continue to smoke, the ulcer will become larger and deeper. Later, you can have severe bleeding and you can even vomit blood. This will necessitate major and immediate surgery to save your life. You will loose a lot of money and may not be able to go for work for many days or even weeks.

If you stop smoking now, you will get complete relief and medicines will also work better. So, you should quit smoking now.

Smoking, while not the cause of your illness, can make your stomach ulcer worse and prevent its healing.

FACT SHEET

The fact sheets are to be used by the tutor to supplement the discussion about the scenario. This fact sheet will address background information on tobacco that could be relevant to the scenario.

Tobacco and Oral Diseases:

- The oral effects of smoking range from harmless stains of teeth and dental restorations to serious diseases such as oral cancer.[1]
- The plausible mechanism for smoking leading to cancer is that carcinogens in tobacco smoke can induce changes in DNA through tumor suppressor gene coding for the protein p53.[1]
- Smoking and excessive alcohol intake synergistically increase the risk of developing oral cancer.[1]
- The majority of oral cancers, constituting 2–3% of all cancers worldwide, are squamous cell carcinomas developing from the mucosal surface epithelium.[1]
- Oral leukoplakia, the most common premalignant lesion in the mouth, and periodontitis are far more common in smokers than in non-smokers.[1]
- Implant failures attributable to smoking seem to be more common in the maxilla than in the mandible.[1]
- A consistent finding in smokers is an increased concentration of thiocyanate in saliva.[1]
- Smoking is associated with higher incidence of dental caries. Maternal smoking is associated with the occurrence of caries in preschool children.[1]
- Smoking causes discoloration of teeth, dental restorations, and dentures, affecting the aesthetic appearance of the mouth.[1]
- Smoking is a common cause of halitosis, and it affects the acuity of smell and taste.[1]

Tobacco and Non-malignant GI Diseases

- Smoking stimulates basal acid output and pepsinogen secretion.[2]
- Smoking significantly decreases total mucous neck cell population and neck-cell mucus volume and increases bile salt reflux rate and gastric bile salt concentration, thereby increasing duodenogastric reflux.[2]
- Smoking not only induces ulceration but also potentiates ulceration caused by H. pylori, alcohol, and nonsteroidal anti-inflammatory drugs.[2]
- Smoking decreases prostaglandin generation in the gastric mucosa of smokers, thereby making the mucosa susceptible to ulceration.[2]
- Smoking or smoke extract impairs both spontaneous and drug-induced healing of ulcer.[2]
- Smoking weakens the lower oesophageal sphincter, which allows stomach acid to flow into the esophagus.[3]
- Smoking harms the liver's ability to process drugs, alcohol, and other toxins and worsens liver disease caused by drinking too much alcohol.[3]
- Among people with Crohn's disease, smoking is linked with a higher rate of relapse, repeat surgery, and the need for drug therapy.[3]

- Smoking may increase the risk of developing gallstones.[3]

1. REFERENCES FOR THE FACT SHEET:

1. Reibel J. Tobacco and oral diseases: Update on the evidence, with recommendations. Med Princ Pract. 2003; 12(suppl 1):22–32.
2. Maity P, Biswas K, Roy S, Banerjee RK, Bandyopadhyay U. Smoking and the pathogenesis of gastro-duodenal ulcer—recent mechanistic update. Mol Cell Biochem. 2003; 253:329–38.
3. National Digestive Diseases Information Clearinghouse (NDDIC, a service of NIH), Smoking and your digestive system. NIH Publication No. 06–949, 2006. Available at: http://digestive.niddk.nih.gov/ddiseases/pubs/smoking/#harm.

2. REFERENCE LIST FOR MODULE

MINI LECTURE 1 [*Tobacco and Common Abdominal Disorders]*

1. National Digestive Diseases Information Clearinghouse (NDDIC, a service of NIH), Smoking and your digestive system. NIH Publication No. 06–949, 2006. Available at: http://digestive.niddk.nih.gov/ddiseases/pubs/smoking/#harm.
2. Maity P, Biswas K, Roy S, Banerjee RK, Bandyopadhyay U. Smoking and the pathogenesis of gastro-duodenal ulcer—recent mechanistic update. Mol Cell Biochem. 2003; 253:329–38.
3. Zevin S, Benowitz NL. Drug interactions with tobacco smoking: an update. Clin Pharmacokinet. 1999; 36:425–38.
4. Nichter M, Nichter M, Van Sickle D. Popular perceptions of tobacco products and patterns of use among male college students in India. Soc Sci Med. 2004; 59:415–31.
5.
6.

MINI LECTURE 2 [*Tobacco and Oral Diseases]*

1. Reibel J. Tobacco and oral diseases: Update on the evidence, with recommendations. Med Princ Pract. 2003; 12(suppl 1):22–32.
2. Tomar SL, Asma S. Smoking-attributable periodontitis in the united states: findings from NHANES III. J Periodontol. 2000; 71:743–51.
3. Gupta PC, Ray CS. Epidemiology of betel quid usage. Ann Acad Med Singapore. 2004; 33:31S–36S.
4. Gupta PC, Ray CS. Smokeless tobacco and health in India and South Asia. Respirology. 2003; 8:419–31.
5. Campbell HS, Simpson EH, Petty TL, Jennett PA. Addressing oral disease—the case for tobacco cessation services. J Can Dent Assoc. 2001; 67:141–4.

6. La Vecchia C, Franceschi S, Bosetti C, Levi F, Talamini R, Negri E. Time since stopping smoking and the risk of oral and pharyngeal cancers. J Natl Cancer Inst. 1999; 91:726–8.
7. World health Organization. Global facts on Tobacco or Oral Health. WHO 2005. Available at: www.who.int/oral_health

3. INSTRUCTOR KEY RESOURCES/REFERENCES

1. Reibel J. Tobacco and Oral Diseases: Update on the Evidence, with Recommendations. Med Princ Pract 2003;12:22–32
2. Maity P, Biswas K, Roy S, Banerjee RK, Bandyopadhyay U. Smoking and the pathogenesis of gastro-duodenal ulcer – recent mechanistic update. Molecular and Cellular Biochemistry 2003;253:329–38.

4. SUPPORT KEY REFERENCES

1. World health Organization. Global facts on Tobacco or Oral Health. WHO 2005. Available at: www.who.int/oral_health
2. National Digestive Diseases Information Clearinghouse (NDDIC, a service of NIH), Smoking and your digestive system. NIH Publication No. 06–949, 2006. Available at: http://digestive.niddk.nih.gov/ddiseases/pubs/smoking/#harm.

5. INSTRUCTOR WEB-SITE RESOURCES

1. www.who.int/oral_health
2. http://digestive.niddk.nih.gov/ddiseases/pubs/smoking/#harm

6. SAMPLE EXAMINATION QUESTIONS

Short Answers

1. Discuss oral pre-cancers associated with tobacco use.

2. Describe the patho-physiology of tobacco and oral diseases.

3. Describe the various mechanisms by which smoking causes gastric ulcers.

Multiple Choice Questions (Answers in blue font)

1. Carcinogens in tobacco smoke can induce changes in DNA through tumor suppressor gene coding for the protein _____ leading to increased risk of oral cancer.

a. p54
b. p53
c. p450
d. p540
e. None of the above

2. The following is true of smoking and alcohol

a. Increases risk of only gastric ulcer
b. Has no effect on oral cancer risk
c. Does not worsen alcohol induced liver disease
d. Synergistically increases risk or worsens oral cancer, liver disease, and gastric ulcer
e. None of the above

3. The most common oral pre-malignant lesion is _____

a. Finger print lesion
b. Pumice stone lesion
c. Oral leukoplakia
d. Palatal keratosis
e. Smoker's melanosis

4. Smoking _____ basal acid output and _____ total mucous neck cell population

a. Increases, increases
b. Decreases, stimulates
c. Decreases, decreases
d. Stimulates, decreases
e. None of the above

5. Which is **not true** regarding smoking and gastric ulcer?

a. Induces ulceration
b. Potentiates ulceration caused by H. pylori, alcohol, etc.
c. Impairs drug-induced healing of ulcer
d. Delays spontaneous healing of ulcer
e. None of the above

6. Which of the following is **not true** regarding smoking and Crohn's disease?

a. Clear evidence of short-run weight gain
b. Results in upper body fat distribution
c. No evidence of steady weight gain

d. Has no adverse health effect
e. One of the reasons for smoking relapse in women