TOBACCO AND NEOPLASIA

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Hasanuddin University, Makasar, South Sulawesi
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Islamic University of Indonesia, Yogyakarta

TOBACCO AND NEOPLASIA

I. GOAL OF MODULE: Provide students with knowledge about the harmful effects of tobacco on the body leading to various carcinomas and the mechanism causing carcinogenic tobacco effects on the body; provide skills to address smoking and to provide smoking cessation counseling for patients with different cancers.

II. TARGET AUDIENCE

a. Undergraduate students

b. $4^{th}/5^{th}$ semester—*Course or Subject: Community Medicine/ Radiotherapy (Surgery)*

III. LEARNING OBJECTIVES

- To understand that there are different powerful carcinogens in cigarette smoke.
- To understand the mechanism of how the carcinogens in cigarettes cause cancer through DNA mutation
- To understand how smoking causes lung cancer, is a risk factor for digestive cancer, causes urogenital cancer, has adverse effects on cancer management, and effects of tobacco cessation on risk and management of cancers.

IV. CURRICULUM STANDARDS ADDRESSED:

India: 5–6th semester during surgical speciality postings. Under surgery and its allied specialities are 138 hours alloted to radiotherapy, wherein there are:

- Lectures of 10 hours
- Practicals of 128 hours are alloted

Objectives are:

- Students shall be able to identify symptoms and signs of various cancers and their steps of investigation and management and be aware of radiation therapy, its advancement, and managment of cancers.
- Students will develop skills to take detailed clinical history of cases having malignant diseases and assist in administration of anticancer drugs and application of radiotherapeutic equipment for cancer management.

V. MINI-LECTURES

MINI LECTURE 1: TOBACCO AND CARCINOGENESIS

CORE SLIDES

1. Carcinogenic Content of Cigarettes
2. Tobacco Carcinogenesis Mechanism (1)
3. Tobacco Carcinogenesis Mechanism (2)
4. Behavioural Model of Tobacco Addiction

OPTIONAL SLIDES

1. Nicotine addiction and invasive cancers

MINI LECTURE 2: TOBACCO AND RESPIRATORY CANCERS

CORE SLIDES

1. Which Cancers Occur at a Higher Rate in Smokers?
2. Smoking and Lung Cancer
3. Tobacco and Asbestos
4. SHS and Lung Cancer
5. Smoking Reduction Reduces Risk
6. Cessation and Lung Cancer

OPTIONAL SLIDES

1. Lung Cancer Mechanism

MINI LECTURE 3: TOBACCO AND CANCERS OF THE DIGESTIVE TRACT

CORE SLIDES

1. Tobacco and Digestive Cancers
2. Tobacco and Digestive Cancer Risk (1)
3. Tobacco and Digestive Cancer Risk (2)
4. Smokeless Tobacco and GI Cancers
5. Alcohol and Smoking: Combined Effects
6. Alcohol and Smoking: Combined Rehabilitation

MINI LECTURE 4 : TOBACCO AND UROGENITAL CANCER

CORE SLIDES

1. Tobacco and Risk of Urogenital Cancers
2. Tobacco and Bladder Cancer
3. Tobacco Kidney Cancer
4. Cessation and Bladder Cancer

OPTIONAL SLIDES

1. Tobacco and Urogenital Cancers: Mechanism

MINI LECTURE 5: TOBACCO CESSATION AS AN IMPORTANT PART OF CANCER MANAGEMENT

CORE SLIDES

1. Smoking Affects Cancer Treatment
2. Impact of Smoking Cessation on Cancer Management
3. Barriers to Smoking Cessation in Cancer Patients
4. Cessation and Cancer Prevention

5. Cessation in Cancer Survivors
6. Screening—A Must Do!

VI. CASE DISCUSSION / CLINICAL SCENARIO

CASE SCENARIO—asking patient about smoking

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 on their smoking cessation attempts.

Introduction

It has been well documented that smoking has a direct and indirect association with various cancers, including (but not limited to) lung cancer, oral cancer, cancer of the larynx and esophagus; digestive cancers; and urogenital cancers (bladder, cervix, and kidneys). Notably, 30% of all cancer deaths and up to 90% of all lung cancer deaths are attributable to smoking. Tobacco cessation is extremely important in cancer management.

Learning Objectives

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

- Routinely ask all patients about their smoking status
- Assess patients' readiness to quit
- Advise patients with cardiovascular problems to quit smoking
- Assist the patients to quit
- Arrange follow ups on patients' smoking cessation progress
- Explain the harm of smoking on cardiovascular system

Asking the patients' smoking history

The health consequences of cigarette smoking are well known as is the fact that there is no part of the human body that is not affected by tobacco.

In a survey done by QTI, 77% of Indian doctors did not routinely ask patients about smoking. 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 (Fiore et al. 2000).

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 of the patients' smoking status in the medical record (maybe you can indicate patients' smoking status in your patients' card). Women and children should not be excluded and they should also be asked about passive smoking.

Case Scenario

A 40 year old man has a history of heartburn for six months.He has been experiencing difficulty swallowing and inability to swallow solid foods (eventually liquids also) for one week. He also has pain with swallowing and considerable weight loss in the past month. Investigations show a growth in the pharynx.

He has been a smoker for the last 15 years and smokes 5–6 cigarettes a day. He consumes alcohol moderately (up to 5 drinks every day). Patient is a government employee and his wife is a home maker. He has a 12 year old son in school.

Vital Signs
Blood Pressure: 140/90 mm of Hg
Pulse: 76/min
Body Weight: 75kg
Temperature: 98.4 F
Smoking Status: Smoker Ex-Smokers Never Smoke (Circle one)
Smoking 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	
1.	• Ask patient whether he/she smokes or not	
2.	• If the patient doesn't smoke, ask whether he/she ever smoked before	
3.	• If the patient smokes, ask how many cigarettes he/she takes per day	
	Assess	
4.	• Assess patient's readiness to quit.	
	Advise	

5.	• Advise patient to quit smoking	
6.	• Personalize advice by using the tobacco user's health status/disease	
	Assist	
7.	• Assist the patient to quit by giving him/her pamphlets, brochures	
	Arrange for Follow-up	
8.	• Arrange to follow up on tobacco use	

Points for Discussion

- Since the growth was screened and diagnosed early, it may be treated by surgery or radiation. One of the main reasons for the growth is smoking. Stopping smoking is very important even at time of diagnosis to get early cure and to minimize discomfort.
- **Smoking causes post operative complications**. Smoking delays wound healing after surgery and may cause infections at wound sites. If smoking continues, healing of the operation site will take a longer time and discomfort like pain, nausea, irritation will be greater.
- **Smoking can cause second malignancies.** Moreover, the other parts of mouth are also unhealthy and hence vulnerable for new cancerous growth. Continued smoking or chewing any tobacco product will result in new growth in those parts also. Quitting smoking will help the unhealthy areas to recover. Therefore it is important to quit smoking at once.
- **Smoking also reduces efficacy of treatment drugs and radiation**. Smoking also affects the treatment efficacy of the drugs and how the body responds to the radiation due to the presence of toxins in the tobacco smoked or chewed.
- It is also not advisable to continue drinking because **alcohol and smoking have a synergistic effect** causing cancers and inhibiting treatment. Therefore it is advisable to stop alcohol too with smoking.

FACT SHEETS TO SUPPORT DISCUSSION (STUDENT HANDOUTS)

Tobacco and Neoplasia

1. Smoking increases the risks for many cancers and is known as the cause of cancers in the respiratory tract, urinary bladder, pancreas, and kidneys.[1]
2. There is sufficient evidence to show the casual relationship between smoking and the following cancers: lung cancer; laryngeal cancer; oral cavity and pharyngeal cancer esophageal cancer; pancreatic cancer; renal cell, renal pelvis, and bladder cancer; cervical cancer; gastric cancer; and acute myeloid leukemia.[1]
3. Tobaccos smoke has more than 50 carcinogens, the most potent of which are polycyclic aromatic hydrocarbons (PAHs) and tobacco specific nitrosamines (TSNs).[2]
4. Women who are exposed to second hand smoke from their husbands are 1.2 times more likely to suffer from lung cancer.[1]
5. The evidence is suggestive to infer causal relationship between exposure to second hand smoking and breast cancer and nasal sinus cancer.[1]
6. The cause of lung cancer is tobacco smoking in as many as 90% of patients.[3]
7. The development of lung cancer is directly related to the number of cigarettes smoked, the length of smoking history, and the tar and nicotine content of the cigarettes, and is highest among current smokers and lowest among nonsmokers.[4]
8. Lung cancer risk increased by as much as 5 times in asbestos exposure.[5]
9. Non-smokers have a statistically significant greater risk of lung cancer if their spouses are smokers than if their spouses are non-smokers.[6]
10. Nondrinkers who smoked 25 or more cigarettes per day had a seven-fold increased risk of oral and pharyngeal cancer compared with nonsmokers.[7]
11. Alcohol when combined with cigarette smoke increases the risk of cancer in the upper aero-digestive tract significantly.[8]
12. Smoking has been shown to increase the risk of cancers of the uterine cervix, urinary bladder, and penis.[9]
13. Cigarette smoking, both past and present, is responsible for approximately 20% of kidney cancer cases among men, and for 10% of cases among women.[10]
14. Smokers' under cancer treatment are at increased risk of experiencing postoperative complications, such as delayed wound healing, and pulmonary and cardiovascular complications, as compared to non-smokers or former smokers. It also affects radiation therapy adversely.[11]
15. The longer the interval between smoking cessation and initiation of cancer treatment, the better the prognosis.[12]
16. Ten to 15 years after giving up smoking, the ex-smoker faces the same low risk of developing cancer of the upper digestive tract, the lungs, the pancreas, and the urinary tract as the nonsmoker.[13]

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Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2004
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10. Scélo G, Brennan P. The epidemiology of bladder and kidney cancer, Nat Clin Pract Urol. 2007; 4(4):205–17. Available at www.nature.com/clinicalpractice/uro.
11. Cooley ME, Sipples RL, Murphy M, Sarna L. Smoking cessation and lung cancer: oncology nurses can make a difference. Semin Oncol Nurs. 2008; 24(1):16–26.
12. Gritz ER, Fingeret MC, Vidrine DJ, Lazev AB, Mehta NV, Reece GP. Successes and failures of the teachable moment: smoking cessation in cancer patients. Cancer. 2006; 106(1):17–27.
13. Wynder EL, Hoffmann D. Tobacco and tobacco smoke. Semin Oncol. 1976; 3(1):5–15.

VII. REFERNCE LISTS FOR MODULES

Mini Lecture 1: Tobacco and carcinogenesis

1. Shields PG. Epidemiology of tobacco carcinogenesis Curr Oncol Rep. 2000; 2(3): 257–62.
2. Van Duuren BL. Tobacco carcinogenesis. Cancer Res. 1968; 28(11):2357–62.
3. Hecht SS Tobacco smoke carcinogens and lung cancer. J Natl Cancer Inst. 1999; 91:1194–1210.
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7. Hecht SS. Cigarette smoking and lung cancer: chemical mechanisms and approaches to prevention. Lancet Oncol. 2002; 3:461–9.

Mini Lecture 2: Tobacco & Respiratory Cancers

1. Vineis P, Alavanja M, Buffler P, Fontham E, Franceschi S, Gao YT, et al. Tobacco and cancer: recent epidemiological evidence. J Natl Cancer Inst. 2004; 96(2):99–106.
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Mini Lecture 3: Tobacco and Digestive Tract Cancers

1. Polesel J, Talamini R, La Vecchia C, Levi F, Barzan L, Serraino D, et al. Tobacco smoking and the risk of upper aero-digestive tract cancers: a reanalysis of case-control studies using spline models. Int J Cancer. 2008; 122(10):2398–402.
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Mini Lecture 4: Tobacco and Urogenital Cancer

1. Harish K, Ravi R. The role of tobacco in penile carcinoma. Br J Urol. 1995; 75(3):375-7.
2. Scélo G, Brennan P. The epidemiology of bladder and kidney cancer. Nat Clin Pract Urol. 2007; 4(4):205–17.
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Mini Lecture 5: Tobacco Cessation as an Important Part of Cancer Management

1. Cooley ME, Sipples RL, Murphy M, Sarna L. Smoking cessation and lung cancer: oncology nurses can make a difference. Semin Oncol Nurs. 2008; 24(1):16–26.
2. Gritz ER, Fingeret MC, Vidrine DJ, Lazev AB, Mehta NV, Reece GP. Successes and failures of the teachable moment: smoking cessation in cancer patients. Cancer. 2006; 106(1):17–27.
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VIII. INSTRUCTOR KEY RESOURCES/REFERENCES

Mini Lecture 1

1. Hecht SS. Cigarette smoking and lung cancer: chemical mechanisms and approaches to prevention. Lancet Oncol. 2002; 3:461–9.

Mini Lecture 2

1. Vineis P, Alavanja M, Buffler P, Fontham E, Franceschi S, Gao YT, et al. Tobacco and cancer: recent epidemiological evidence. J Natl Cancer Inst. 2004; 96(2):99–106.
2. Tan WW, Farina GA, Huq S, Maghfoor I, Perry M, Ramnarine M. Non-small cell lung cancer. Available at http://emedicine.medscape.com/article/279960-diagnosis. 2008; updated: Mar. 30, 2011.

Mini Lecture 3

1. Polesel J, Talamini R, La Vecchia C, Levi F, Barzan L, Serraino D, et al. Tobacco smoking and the risk of upper aero-digestive tract cancers: a reanalysis of case-control studies using spline models. Int J Cancer. 2008; 122(10):2398–402.
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Mini Lecture 4

1. Scélo G, Brennan P. The epidemiology of bladder and kidney cancer. Nat Clin Pract Urol. 2007; 4(4):205–17.

Mini lecture 5

1. Cooley ME, Sipples RL, Murphy M, Sarna L. Smoking cessation and lung cancer: oncology nurses can make a difference. Semin Oncol Nurs. 2008; 24(1):16–26.

IX. INSTRUCTOR WEB-SITE RESOURCES

1. http://emedicine.medscape.com/article/279960-diagnosis 2008

X. SAMPLE EXAMINATION QUESTIONS

Short Answers

1. By what mechanism does tobacco cause carcinogenesis?

2. What are the different cancers for which tobacco is a risk factor?

3. How does smoking affect cancer management adversely?

Multiple Choice Questions:

1. There are around _____ carcinogens in cigarette smoke.
   a. 50 b. 25 c. 60 d. 15

2. Tobacco is a risk factor for which of the following cancers:
   a. Oral b. Liver c. Kidney d. All of the above

3. Which among the following in cigarette smoke is the main carcinogen
   a. HPV b. Benzopyrine c. Lead d. Free radicals

4. Which among the following is a true statement?

   Smoking causes carcinogenesis by:
   a. Mutation b. DNA damage
   c. Inhibits apoptosis d. All of the above

5. Smoking affects cancer management adversely by
   a. Delaying wound healing in post op c. Complications in radiotherapy
   b. Reduces efficacy of chemotherapy d. All of the above

6. After _____ years of cessation, the risk of cancers in an ex-smoker becomes similar to that of persons who have never smoked
   a. 5–10yrs b. 10–15yrs c. 15–20yrs d. 20–25yrs