

DIFFERENTIAL DIAGNOSIS

Objectives:

The objective of this unit is to determine the risk of bias of the results of an observational study of disease prevalence, determine what the results were, and how the results might apply to a clinical involving a question about differential diagnosis.

Assignment:

Review the clinical scenario, read the attached article by Abdulmalak et al, and critically appraise this study using the attached worksheet and the relevant chapter of the Users' Guides text. Read the brief research letter by Mondoni et al and contrast it to the worksheet answers for the Abdulmalak article. Come to the tutorial prepared to discuss the readings in the context of the scenario.

Clinical Scenario:

You are the attending physician on a general medical inpatient service supervising a small team of medical residents and medical students. A resident just reviewed a 65 year old male who presented to the emergency department with hemoptysis. He reports vague complaints of fatigue for a week or two prior to coming to the hospital and a dry cough starting 4 or 5 days ago. In the last 24 hours he noted streaks of blood in his sputum followed by frankly bloody sputum that he estimates was 100-200 mL total. He has been afebrile and hemodynamically stable since coming to the emergency department (blood pressure most recently 158/88 mmHg with a regular heart rate at 98 bpm and an oxygen saturation of 92% by pulse oximetry). A chest X-ray shows patchy infiltrates throughout the right hemithorax and involving the base of the right hemithorax with no definite masses, no cardiomegaly, and no signs of interstitial edema. A complete blood count was performed by the emergency department and shows a hemoglobin of 118 g/L (11.8 g/dL; lower limit of normal 120 g/L or 12.0 g/dL), a white blood cell count of 8.8×10^9 cells/L (upper limit of normal 9×10^9 cells/L), and a platelet count of 350×10^9 /L (in the middle of the normal range).

The medical student who initially saw the patient is excited that the available evidence suggests this is not one of the more common causes of hemoptysis such as infection (no fever or increased white blood cell count), malignancy (no masses on X-ray) or heart failure (no evidence on X-ray). She suggests consulting the pulmonary physicians to perform a bronchoscopy, doing advanced imaging studies and initiating a work-up for uncommon causes of hemoptysis.

The senior resident on your team applauds the medical student for a well thought out initial approach but is skeptical of the need for a complicated or invasive work-up. He suggests this is much more likely an atypical presentation of a common condition than a typical presentation of an uncommon condition and we should focus on the most likely

causes to avoid unnecessary discomfort, time and costs. The medical student appears deflated until you respond back to the resident, “So, what is the likely diagnosis and how uncommon are the “uncommon” conditions?”

The resident is called away by a page before he can respond so you urge the medical student to start looking for evidence to support or refute the need for an expansive work-up. The medical student quickly checks google scholar and comes up with an abstract that includes about 75,000 patients with hemoptysis and suggests half of the cases of hemoptysis that present to hospital are cryptogenic (meaning, no appreciable underlying cause) initially. However, many turn out to be malignancy and any hemoptysis is associated with a 1 in 5 chance-of-death in one year. A thorough work-up is therefore still warranted the medical student exclaims! Despite the impressive sample size, you’re a seasoned clinician and it seems unusual to you that half the cases of hemoptysis are not diagnosed initially.

You decide you should review the article together and immediately note it is based on administrative data. You suggest contrasting it to another article that is done prospectively. Luckily, clicking “related articles” shows another paper in the same journal that is a prospective observational cohort.

Enclosed Materials:

1. Abdulmalak C et al. Hemoptysis in adults: a 5-year study using the French nationwide hospital administrative database. *Eur Respir J.* 2015; 46: 503-511.
2. Mondoni et al. Observational, multicentre study on the epidemiology of haemoptysis. *Eur Respir J.* 2018; 51: 1701813 (epub).
3. Guyatt G, Drummond R. *Users' Guides to the Medical Literature: A Manual for Evidence-based Clinical Practice.* 3rd Edition (JAMA). New York, NY: McGraw-Hill Companies, Inc, 2015. 17 Differential Diagnosis.
4. Worksheet for the evaluation of an article on differential diagnosis.