Evaluation of Abdominal Pain in the Elderly

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General principles: avoid nonsteroidal anti-inflammatory drugs (NSAIDs; result in significant complications); elderly with abdominal pain different; computed tomography (CT) overused; use cautiously in elderly; shown to make difference; err on side of admission; risk for catastrophe from peptic ulcer disease (PUD) significant in elderly; mortality in appendectomy 1 in 4 in those >65 yr of age; risk for bleeding from NSAIDs 36-fold greater in elderly; study — followed patients >65 yr of age who presented to emergency department (ED) for abdominal pain for several months; found that 50% had serious abdominal problems (requiring surgery or admission to hospital for intravenous [IV] antibiotics; cancer); presentation — more subtle (fever not as high; abdominal pain not as severe; white blood cell [WBC] count not as elevated; abdominal examination more subtle); comorbidities usually present, resulting in higher risk for complications; medications — add to complexity; need to space if several medications used; NSAIDs can cause renal disease and gastrointestinal (GI) disease; prednisone increases WBC count or confuses interpretation of WBC count and blunts immune response; β-blockers resolve tachycardia, but can mislead assessment of patient; differential diagnosis — broad due to more potential diseases in elderly; compared to younger patients

Case: woman, 71 yr of age, presents with abdominal pain for few hours; denies fever, nausea, vomiting, or constipation; previously felt well, with no previous abdominal symptoms; describes abdominal pain as moderate but persistent; has comorbid medical problems; on medications; physical examination (PE) — slightly tachycardic; has mild discomfort; slightly pale; heart and lungs normal; abdomen slightly distended, diffusely tender with no guarding or rebound; stool trace guaiac-positive; laboratory studies unremarkable, except for elevated WBC count; upright chest x-ray shows free air under diaphragm

Peptic ulcer disease: Helicobacter pylori — prevalence in elderly roughly equal to age in percentage; prevalence 80% in presence of PUD; ingestion with food, antacids, and H2 blockers not protective against developing PUD from NSAIDs; proton pump inhibitors provide some protection; presents as abdominal catastrophe in 10% of elderly patients; in younger patients, present as pain, reflux, burning, and tenderness in epigastrium; bleeding occurs in 76% of patients >74 yr of age with PUD; 30% present without pain; annual incidence of serious GI complications 1 in 200 in younger population (1.5% in 60- to 70-yr age group and approaching 3% in those >70 yr of age); in elderly patients on low-dose aspirin, risk for GI complications same as with traditional NSAID; cyclooxygenase-2 inhibitor (without aspirin) reduces risk for GI complications by ~50%

Epidemiology: elderly represent increasingly large percentage of population (presently 13%-14%; individuals >75 yr of age visit ED have 55% chance for admission; individuals >85 yr of age fastest growing segment of population

Difficulties in evaluation of elderly: patient stubbornness; presence of dementia; hearing problems; “labeling”; fear of loss of independence (influences history provided); anatomic and physiologic concerns — atrioventricular block; absence of omentum; previous surgeries can cause segmentalization of compartments in abdomen, localization, and loculation; presence of atherosclerotic vascular disease; blunted fever and WBC responses (less robust immune response); coexistent disease; decreased pain sensitivity (in study of patients with peritonitis, only 55% complained of pain and only 33% had guarding or rebound; in another study of patients >65 yr of age with ulcers, only 21% had peritoneal signs)

Nonabdominal causes of abdominal pain: pulmonary embolism possible, but highly unlikely (causes referred pain to abdomen); myocardial infarction; pneumonia (especially in lower lobe, irritating diaphragm); diabetic ketoacidosis (ileus); glaucoma; bladder or genitourinary infection

Impact on ED: average length of stay of patients >65 yr of age double that of younger patients, especially if abdominal pain present; elderly comprise >20% of all ED visits, 33% of all ambulance traffic, 65% of all admissions, and 50% of all admissions to intensive care unit

Case: man, 78 yr of age, has waxing-and-waning fever for one week; decreased appetite with no nausea, vomiting, or abdominal pain; presents to ED for persistent fever; past medical history significant for hypertension; PE — temperature of 101°F; heart rate of 106 beats/min; skin warm and dry; normal findings on examination of chest, heart, and abdomen; rectal tone good, with negative brown-black stools; laboratory work-up within normal limits, except for slight elevation of alkaline phosphatase (ALP); discharged home; patient returned to ED 2 days later after evaluation by primary medical doctor; PE showed no abnormal findings, but ultrasonography (US) showed acute acalculous cholecystitis (thickened bowel wall and variably echogenic area of gallbladder [pus around gallbladder])

Biliary tract disease in elderly (>65 yr of age): most common diagnosable cause of abdominal pain of all patients >65 yr of age who present to ED; pain absent in 25%; no fever or

Educational Objectives
The goal of this program is to improve the diagnosis and management of abdominal pain and delirium in the elderly. After hearing and assimilating this program, the clinician will be better able to:

1. Discuss the difficulties in evaluating an elderly patient.
2. Avoid medications that can cause gastrointestinal problems in the elderly.
3. Diagnose and manage gastrointestinal (GI) and non-GI causes of abdominal pain in the elderly.
4. Utilize the multifactorial approach to managing delirium in the elderly.

5. Recognize predisposing factors for delirium in the elderly.

Faculty Disclosure
In adherence to ACCME Standards for Commercial Support, Audio-Digest requires all faculty and members of the planning committee to disclose relevant financial relationships within the past 12 months that might create any personal conflicts of interest. Any identified conflicts were resolved to ensure that this educational activity promotes quality in health care and not a proprietary business or commercial interest. For this program, the faculty and planning committee reported nothing to disclose.
leukocytosis in significant percentage; gallbladder third most common cause of sepsis in elderly (skin third most common cause); gallstones — present in close to 50% of elderly patients; as elderly patients grow older, incidence in men increases to that in women (gallstones more common in women in younger age group); incidence of acalculous cholecystitis 10% in elderly patients; infections possible cause of altered mental status or altered level of consciousness, and consider gallbladder disease in differential diagnosis; mortality 10%; WBC count, serum bilirubin, serum amylase, and liver function tests possibly not helpful; US useful in diagnosis of gallstones, but not for inflammation of gallbladder; hepatobiliary iminodiacetic acid scan useful for assessing gallbladder function; err on side of admitting elderly patient, but if not possible, close follow-up indicated.

CT in elderly: alters decision making in 25% of cases; doubles diagnostic certainty from 36% to 77%; identifies need for surgery in 12%; clarifies need for antibiotics in 20%; biggest concern is nephropathy from contrast.

Case: woman, 70 yr of age, with vague abdominal pain for 2 days; no associated nausea, vomiting, diarrhea, or fever; long history of intermittent constipation (no cause found in previous work-ups); on medication for urethritis; febrile; abdomen slightly tender in right lower quadrant (RLQ), with no rebound or guarding; rectal examination negative; laboratory tests unremarkable; on surgery, significant amount of stool seen in abdomen from ruptured appendix.

Appendicitis in elderly: pain present in most, but not often localized to RLQ; traditional presentation (pain initially in epigastrium to periumbilical area to RLQ) seen in only one-third of patients; 90% have tenderness, but guarding or rebound rare; one-third of patients afebrile; WBC count possibly not elevated, but shift to left often seen; CT and US helpful if positive; markers for inflammation (ie, erythrocyte sedimentation rate and C-reactive protein) not highly sensitive or specific; accounts for ≈5% of all abdominal emergencies; >50% perforate before surgery (due to subtle and delayed presentation for diagnosis and treatment); initial misdiagnosis common; 10% of all cases occur in patients >65 yr of age, but account for 50% of all deaths; mortality approaching 25%; average patient >65 yr of age on 4.5 medications and on additional 2.1 over-the-counter medications; pain medications affect ability to conduct adequate physical examination.

Case: man, 76 yr of age, with acute onset of progressively worsening severe abdominal pain; one episode of emesis and one episode of large watery stools denies abdominal pain; on several medications and with several comorbidities; tachycardic, tachypneic, and in severe distress; irregular regular heart rhythm; lungs normal; abdomen soft, with minimal tenderness and no guarding or rebound; stool brown but guaiac test positive; laboratory studies — electrocardiography (ECG) showed atrial fibrillation; WBC count elevated with left shift; serum phosphate elevated, with slight acidosis and anion gap; basic x-rays films negative; diagnosis mesenteric ischemia.

Mesenteric ischemia: catastrophic because diagnosis difficult; morbidity and mortality significant; when diagnosis made, often too late; hallmark is pain out of proportion to physical findings; causes include embolus (causes sudden severe pain); atherosclerotic vascular disease (causes intestinal ischemia over time; history of intestinal angina sometimes present); mesenteric venous thrombosis (rare, difficult to diagnose, and almost always associated with hypercoagulable state); and nonocclusive mesenteric ischemia (most common; patient usually has several comorbidities and atherosclerotic vascular disease, causing poor perfusion and eventually leading to low-flow state to abdomen); emboli account for ≈33% of cases, causing dramatic severe pain (signs of mesenteric ischemia seen elsewhere); arterial thrombosis — more common; history of deep boring pain after eating which resolves after food digested (intestinal angina); also caused by coagulation disorders and malignancies; diagnosis — difficult, if not impossible, early on, before patient develops ischemia; WBC count possibly elevated; elevation in serum phosphate nonspecific; lactic acidosis not seen until patient develops ischemia (due to poor perfusion to cells); may see free air on kidney, ureter, and bladder x-ray; CT and CT angiography beneficial; angiography gold standard; glutathione S-transferase (GST)-alpha protein and intestinal fatty acid-binding (IFAB) protein less sensitive and not present early in course of disease; D-dimer test not beneficial; mortality significant; more common in men due to atherosclerotic vascular disease; CT shows obstruction of vessels, air in wall, and infarction of various organ tissues; treatment supportive (ie, fluids); avoid vasopressors if possible; early involvement of surgery department; case reports of thrombolytic use but no good evidence.

Geriatric Delirium

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Introduction: in classic disease model, attempt made to find one diagnosis to explain all of patient’s symptoms; in geriatrics, multifactorial causes present, and treatment of only one symptom does not resolve condition.

Delirium: brain failure; incidence — about one-third of older patients present to ED with confusion; one-third of inpatients subsequently develop delirium; associated morbidity — risk for delirium high in hip fractures and major cardiovascular surgery; patient delirious on admission and admitted to hospital has ten-fold increased risk for mortality; 3- to 5-fold increase in nosocomial complications, longer hospital stay, and nursing home placement; poor functional recovery and less likelihood of discharge to home; recognized by physicians in 20% of cases and by nurses in 50% of cases.

Diagnosis: Diagnostic and Statistical Manual — 4th Edition (DSM-IV) diagnostic criteria — disturbance of consciousness with reduced ability to focus, sustain, or shift attention; confusion assessment method (CAM) — requires features 1 and 2, ie, acute change in mental status and fluctuating course and inattention (unable to finish mini mental status examination [MMSE]) and either feature 3 or 4 (ie, disorganized thinking and altered level of consciousness); good sensitivity (90%-95%) and specificity (90%), spectrum of delirium — hyperactive or agitated delirium; hypoactive delirium (less recognized and others); identify and treat reversible medical conditions; medication; — multifactorial approach recommended because multiple factors contribute to delirium; requires interdisciplinary effort by physicians, nurses, family, and others; identify and treat reversible medical conditions;
treat infections; maintain behavioral control; anticipate and prevent complications; minimize or keep risk factors as low as possible to prevent development of delirium or worsening delirium; restore function; almost all medications can potentially cause delirium if time course appropriate; side effects of anticholinergics include confusion, constipation, urinary retention, cardiovascular changes, and tachycardia; antidepresants; antihistamines usually contain diphenhydramine (strongly anticholinergic); detailed medical history important; behavioral problems — haloperidol used only if absolutely necessary (only if patient has high likelihood of harming him- or herself and others, and semi-sedation required to carry out therapy); provide “social” restraint (allow sitter or family to stay in room); can also use lorazepam (Ativan) or diazepam (Valium); benzodiazepines generally not recommended, except in alcohol withdrawal, neuroleptic malignant syndrome or seizure disorder; antipsychotics generally used; newer atypical antipsychotics equally effective, but not studied as well as haloperidol; haloperidol — for mild delirium, 0.25 to 0.5 mg (oral, intravenous, or intramuscular); for severe delirium, 0.5 mg to 2 mg (should not administer 2 mg as single dose); assess for extrapyramidal side effects; not indicated in patients with QT prolongation; rehabilitation — attempt to get patient out of bed, reoriented, and returned to regular routine as soon as possible; use orienting stimuli (clocks, radios, and calenders); take patient out of room; use eyeglasses and hearing aids appropriately; ensure adequate intake of nutrition and fluids; involve family; involve physical therapy and occupational therapy, so patient out of bed and ambulatory; therapy should be interdisciplinary

Prevention: not possible in all patients; reverse predisposing factors if present; avoid medications more likely to cause confusion; treat infections; for hospitalized patients, remove catheters and central lines as soon as possible; ensure adequate fluids and sleep; keep room quiet; maximize mobility; educate family

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Estimated time to complete the educational process:
- Review Educational Objectives on page 1: 5 minutes
- Take pretest: 10 minutes
- Listen to audio program: 60 minutes
- Review written summary and suggested readings: 35 minutes
- Take posttest: 10 minutes
1. Which of the following is(are) not protective against development of peptic ulcer disease (PUD) from nonsteroidal anti-inflammatory drugs in the elderly?
   (A) Ingestion with food
   (B) Antacids
   (C) H₂ blockers
   (D) All the above **

2. Glaucoma can cause abdominal pain in the elderly.
   (A) True **
   (B) False

3. Which of the following is the most common diagnosable cause of abdominal pain in patients >65 yr of age who present to the emergency department?
   (A) PUD
   (B) Appendicitis
   (C) Biliary tract disease
   (D) Mesenteric ischemia

4. Which of the following tests are beneficial in diagnosing appendicitis in the elderly?
   1. Erythrocyte sedimentation rate
   2. Computed tomography
   3. C-reactive protein
   4. Ultrasonography
   (A) 1,3 **
   (B) 2,4
   (C) 1,2,3
   (D) 2,3,4

5. Pain out of proportion to physical findings is the hallmark of which of the following diseases?
   (A) Abdominal aortic aneurysm
   (B) Diverticulitis
   (C) Mesenteric ischemia
   (D) Pulmonary embolism

6. Delirium is more often recognized by _______ than by _______.
   (A) Physicians; nurses **
   (B) Nurses; physicians

7. In the diagnosis of delirium using the confusion assessment model, which of the following features are required?
   1. Acute change in mental status and fluctuating course
   2. Disorganized thinking
   3. Inattention
   4. Altered level of consciousness
   (A) 1,3 **
   (B) 2,4
   (C) 1,2
   (D) 2,3

8. In the spectrum of delirium, which of the following is less recognized and has a poorer prognosis?
   (A) Hyperactive delirium
   (B) Mixed delirium
   (C) Hypoactive delirium **

9. Fecal impaction and urinary retention are predisposing factors for delirium in the elderly.
   (A) True **
   (B) False

10. Benzodiazepines are generally not recommended in elderly patients with delirium, except in:
    (A) Alcohol withdrawal
    (B) Neuroleptic malignant syndrome
    (C) Seizure disorder
    (D) Any of the above **

Answers to Audio-Digest Emergency Medicine Volume 30, Issue 18: 1-B, 2-B, 3-A, 4-A, 5-C, 6-B, 7-A, 8-B, 9-C, 10-D