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Outcome of Patients With Non-diagnostic US in First-trimester Pregnancy

ABSTRACT & COMMENTARY

Source: Tayal VS, et al. Outcome of patients with an indeterminate emergency department first-trimester pelvic ultrasound to rule out ectopic pregnancy. *Acad Emerg Med* 2004;11:912-917.

THE USE OF PELVIC ULTRASOUND (US) PERFORMED BY EMERGENCY physicians (EPs) has gained acceptance in many emergency departments (EDs) for the evaluation of patients in their first trimester of pregnancy who present with symptoms referable to the pregnancy. Previous literature supports the fact that there is no combination of historical data or physical examination findings that reliably can rule out ectopic pregnancy in this population, and that US, specifically transvaginal ultrasound (TVUS), is the study of choice to make this determination. TVUS is preferable to the transabdominal approach; the pregnancy (normal or abnormal) can be identified at a much earlier stage. Formerly this procedure was performed exclusively by radiologists and their technologist staff; now it is performed frequently by EPs in the ED.

The primary goal of TVUS performed by the EP is to determine whether there is a normal intrauterine pregnancy (IUP). Alternative diagnoses include ectopic pregnancy, molar pregnancy, fetal demise, and indeterminate (i.e., no definitive diagnosis evident on TVUS). Based on prior literature, it would be expected that a definite IUP would be identified in 60-70% of these cases, with an abnormal finding or indeterminate finding in 30-40%. Although treatment algorithms for IUP, definitive ectopic pregnancy, molar pregnancy, and fetal demise are clear and straightforward, the same is not true for the indeterminate group. This study seeks to define this group, present a diagnostic algorithm, and look at the ultimate outcome for this population.

This observational prospective cohort study at Carolinas Medical Center, a large, urban, community teaching hospital with an ED census of more than 100,000, looked at its experience with TVUS for patients in this group during a 13-month period. Pelvic US was performed by EPs on all first-trimester patients. Obstetrics/gyne-

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cology consultation was made for all findings, except definite IUP. Definite IUP was defined as a fundal gestational sac with either a visible yolk sac or fetal pole. For all patients with an indeterminate study, final diagnoses were established by the use of patient records, obstetrics/gynecology US reports, laboratory studies, and operative and pathology reports.

During the study period, 1490 patients were examined. Definite IUP was diagnosed in 1037 (70%), 127 (8%) had fetal demise, 24 (2%) had ectopic pregnancy, two (< 1%) had molar pregnancy, and 300 (20%) had indeterminate findings. In this group of 300 with indeterminate findings, the final diagnoses were as follows: 158 (53%) with fetal demise, 88 (29%) with IUP, 44 (15%) with ectopic pregnancy, and unknown outcome in 10 (3%). Of the 44 patients ultimately diagnosed with ectopic pregnancy, 25 (57%) were treated with methotrexate, and 16 (36%) were treated with laparoscopy.

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The authors note that there is a higher percentage of patients with ectopic pregnancies treated medically as opposed to surgically in the "indeterminate" group, than in the group diagnosed with ectopic pregnancy at the outset. ❖

■ COMMENTARY BY ANDREW PERRON, MD, FACEP, FACSM

This is a great study for the person charged with developing a TVUS program at his or her particular institution (as we currently are doing at my hospital). Tayal and his group are clear in their definitions of what constitutes a definite IUP, indeterminate scan, etc. They also take pains to present an explicit algorithm that leaves little room for individual practice variation, which is good, especially when instituting a protocol where violations can have potentially serious adverse consequences for the patient. This study also can serve as a nice quality-control group for comparison as a TVUS program is implemented, looking at expected percentages of a particular finding vs. observed percentages.

I see two primary limitations to this study, but neither is particularly serious. The first is the 3% of patients lost to follow-up with the initial indeterminate scans. It is not clear to what extent the authors sought to define the ultimate outcome of this group. Did they present to another hospital? Did they present to the morgue? This represents only 10 of the 300 patients—not a large percentage group—but the authors easily could have presented a worst-case calculation, grouping patients lost to follow-up into the ectopic subset. The second limitation is in the added observation regarding medical vs. surgical treatment in patients *ultimately* diagnosed with ectopic vs. patients *immediately* diagnosed with ectopic. We know nothing else about those two populations (i.e., Were patients in the latter group more likely to have hypotension? Were patients in the latter group farther along in gestation?). Because we know little about these two groups, comparisons between them may be beyond the scope of the paper.

Epley Maneuver for BPV

ABSTRACT & COMMENTARY

Source: Chang AK, et al. A randomized clinical trial to assess the efficacy of the Epley maneuver in the treatment of acute benign positional vertigo. *Acad Emerg Med* 2004;11: 918-924.

THE STUDY WAS A PROSPECTIVE, RANDOMIZED, SINGLE-BLIND placebo-controlled trial of consecutive

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Questions & Comments

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adult ED patients presenting to a university teaching hospital with benign positional vertigo (BPV). Patients were randomized to treatment with either the Epley maneuver or a placebo maneuver. Before and after the maneuvers, the severity of vertigo was evaluated on a 0 to 10 ordinal scale, which had been published previously in studies evaluating vertigo symptoms. The authors randomized 11 patients to each group before the trial was terminated based on a planned interim analysis. Inclusion criteria were: 1) a history consistent with positional vertigo; and 2) a positive Hallpike test (evocative of symptoms, nystagmus was not required). The authors excluded patients with central nervous system disease, high-grade carotid artery stenosis, unstable heart disease, severe neck disease, restricted mobility, pregnancy beyond the 24th week, vestibular neuritis, labyrinthitis, or other cause of vertigo. The vertigo created by the diagnostic Hallpike test was scored on an ordinal scale. The vertigo scale was based on the symptoms created by a side-to-side head-turning maneuver after the Epley maneuver was performed. The median decreases in vertigo severity were six (95% CI = 4 to 9) for the Epley group and one (95% CI = 0 to 3) for the placebo group ($P = 0.001$). The six patients in the placebo maneuver group who did not achieve a 50% improvement were treated with a rescue Epley maneuver and had improvement similar to the Epley group. The authors conclude that the Epley maneuver is a safe and effective treatment for BPV.

■ **COMMENTARY BY RICHARD HAMILTON, MD, FAAEM, ABMT**

The Epley maneuver is a clever way to slowly move the cupulolith debris in the ampulla of the posterior semicircular canal into the less evocative region of the utriculus. We reviewed this article at our journal club meeting; it created a great deal of discussion. Physicians who have either performed an Epley maneuver on their BPV patients or have had an Epley maneuver performed on them when they had an episode of BPV greatly praised the article and encouraged others to adopt it as a standard of care. In contrast, those physicians who had less experience with the maneuver felt that the study would not change their approach. There are weaknesses in the study. The post-Epley evocative maneuver was less potent than the Hallpike and was bound to cause less vertigo, but the authors had little choice; a repeat Hallpike would cause the BPV to reoccur.

Nonetheless, I can assure you that if you do not learn and perform this maneuver in BPV patients, they eventually will get the maneuver from an otolaryngologist and be miserable until that occurs. In my opinion, this maneuver turns BPV into the “nursemaid’s elbow of the

middle ear”—the patient is better instantly, and the physician is rewarded instantly. Remember to discharge the patient with instructions for restricted head movements—a soft cervical collar can help with this—and to sleep sitting upright until the symptoms resolve completely. One word of caution: The Epley maneuver is only as useful as the accuracy of the original BPV diagnosis; be sure that you carefully select your patients and be certain to avoid this maneuver in patients who have posterior cerebral circulation problems. As a reminder, the Semont liberatory maneuvers can achieve the same therapeutic endpoint in patients and requires less ability to roll on one’s back. For a good description of the Epley maneuvers, see the illustration in the article taken from a prior publication.¹ ❖

Reference

1. Furman JM, et al. Benign paroxysmal positional vertigo. *N Engl J Med* 1999;341:1590-1596.

Erythromycin, QT-Interval Prolongation, and the Risk of Sudden Death

ABSTRACT & COMMENTARY

Source: Ray WA, et al. Oral erythromycin and the risk of sudden death from cardiac causes. *N Engl J Med* 2004;351:1089-1096.

DRUG-DRUG INTERACTIONS ARE A POTENTIALLY hazardous pitfall of practicing medicine; physicians are confronted with new drugs and must become knowledgeable of their adverse effects as well as the potential for interactions with other medicines. One of the more important adverse effects is the rather common potential for certain and varied agents to prolong ventricular repolarization, represented by the QT interval on the electrocardiogram (ECG). Prolongation of the QT interval can predispose the development of torsades de pointes—a type of polymorphic ventricular tachycardia that (if self-terminated) may cause symptoms such as near- or true syncope, or may lead to sudden death. Erythromycin is a common antibiotic known for its propensity to prolong the QT interval.

In this pharmacoepidemiologic study, the authors used the Tennessee Medicaid database to study the association between oral erythromycin and the risk of sudden death from cardiac causes to find the clinical relevance of the known association between erythromycin and QT-interval prolongation. Eligible patients between 1998

and 1994 included those who were 15-84 years of age, not residing in a long-term facility for medical reasons, and without evidence of a life-threatening cardiac illness. The authors examined whether oral erythromycin use was associated with an increased risk of sudden death when prescribed with and without other agents known to potently inhibit the hepatic cytochrome P450 enzyme responsible for its metabolism, CYP3A. These drugs, determined *a priori* based upon a known effect to at least double the area under the time-plasma concentration curve of a recognized CYP3A substrate, included the azole antifungals (ketoconazole, itraconazole, and fluconazole), diltiazem, verapamil, and troleandomycin. Protease inhibitors were excluded because patients with HIV were excluded. Patients who were former users of erythromycin, as well as those who were current users of amoxicillin (no effect on CYP3A, but with a similar antimicrobial spectrum to erythromycin) also were analyzed to uncover confounding effects. Attempts were made to define the main outcome measure, sudden death, as stringently as possible. Insufficient medical documentation for a variety of reasons, or death from another cause, resulted in only 1476 cases deemed to be sudden death from a cardiac cause from the 4404 potential qualifying deaths reviewed.

The study ultimately found 10 deaths within 5305 person-years of current erythromycin users, eight deaths among 6846 person-years of current amoxicillin users, and 100 deaths among 111,779 person-years of former erythromycin users. Those numbers yielded an incidence-rate ratio of 2.01 for the current erythromycin group (95% CI, 1.08-3.75). A group with no use of study antibiotics (1358 deaths in more than 1.1 million person-years) served as the reference group. Three of the eight deaths in the current erythromycin group were patients with concurrent use of a CYP3A inhibitor (one on diltiazem, two on verapamil), yielding an incidence-rate ratio of 5.35 (95% CI, 1.72-16.64)—this was the only group with an increased likelihood of sudden cardiac death. Subsequent analyses found no evidence of concurrent use of other agents known to prolong the QT interval (e.g., cisapride, terfenadine, astemizole, type Ia antidysrhythmics). The authors conclude that the rate of sudden death from cardiac causes was twice as high among current oral erythromycin users and more than five times as high in patients using oral erythromycin and a study drug known to increase its concentration. ❖

■ COMMENTARY BY RICHARD HARRIGAN, MD

This study made for interesting reading, as did the accompanying editorial.¹ The editorial did not laud or assail the study. In fact, it made only passing mention of it. Instead, the editorial stresses the key take-home points

about prolongation of the QT interval, and includes a good table of drugs that prolong the QT interval as well as those that inhibit cytochrome P450 metabolism. Our attention should be focused on five classes of drugs that do the latter: antifungal agents, antiretroviral drugs, calcium channel antagonists, selective serotonin-reuptake inhibitors, and certain antibiotics (some macrolides and fluoroquinolones). Those drugs are potent cytochrome P450 inhibitors, and when added to a drug regimen that contains an agent known to prolong the QT interval, the result may be a significant pharmacokinetic effect on the QT-prolonging drug. Therefore, we must be cognizant not only of drugs that prolong the QT (avoiding adding them to others that prolong the QT, or using them in situations—congenital long QT, hypokalemia—predisposing to prolonged ventricular repolarization), but of agents that prolong the metabolism of these drugs. The editorial offers two noteworthy web-based resources on this topic: www.drug-interactions.com and www.torsades.org.

Regarding this study, the point is well taken, even if the numbers are not compelling. Despite a best-case data scenario—a huge patient cohort—the incidence of the main outcome measure is still quite low, and the confidence intervals reflect the uncertainty in the strength of the association. Moreover, there remains a leap in logic to accept that these cases of cardiac sudden death were indeed mediated by torsades de pointes, allegedly secondary to the study agents. Yet, when added to the case report data that have provided the basis for concern thus far, it seems prudent to remain wary of this phenomenon and careful in our prescription practices.

Reference

1. Liu BA, et al. Drugs and the QT interval—caveat doctor. *N Engl J Med* 2004;351:1053-1056.

Special Feature

Rational Use of Antibiotics in Bronchitis

By David J. Karras, MD, FAAEM, FACEP

UNNECESSARY PRESCRIPTIONS FOR ANTIBIOTICS ARE the most important factor in the development of antimicrobial resistance, needlessly exposing patients to the risk of adverse drug reactions and dramatically increasing health care costs. Although such costs are admittedly extremely difficult to calculate, it has been estimated that more than \$100 million in excess health

care costs are attributable annually to the consequences of inappropriate use of antimicrobial agents.¹

Half of all antibiotic prescriptions in this country are provided for respiratory illnesses, the majority of which are not bacterial in etiology.² Analyses of national hospital databases show that antibiotics are prescribed to 25% of all emergency department (ED) patients with colds and 42% of ED patients with uncomplicated bronchitis.³ Considering that there are about 2.7 million annual ED visits for those complaints, there are enormous numbers of patients receiving unnecessary antibiotic prescriptions from emergency physicians (EPs).

Why do so many patients receive antibiotics when they are not indicated? It does not appear to be a physician cognitive deficit—most doctors know the signs of bacterial respiratory illness and which patients are likely to benefit from antibiotics. Unfortunately, physicians do not make a causal link between development of drug resistance and the prescribing of antibiotics unnecessarily to their own patients. Drug resistance, in other words, is the result of everyone else's inappropriate use of antibiotics. Many studies have shown that the single most important factor in inappropriate antibiotic prescription practices is the physician's response to perceived patient expectations.^{4,6} The doctor thinks the patient wants an antibiotic and that he will be dissatisfied (and perhaps sue) if a prescription is not provided. Results from the same studies show that physicians do a very poor job of detecting which patients really expect to receive antibiotics, and patients don't rank receipt of an antibiotic prescription as a major factor in their satisfaction with medical care.

Fortunately, it seems all the attention focused on appropriate use of antibiotics has been paying off. Recent data show that, although the number of prescriptions of broad-spectrum antibiotics in children continues to rise, the number of antimicrobial prescriptions for bronchitis and upper respiratory infections has started to decrease.⁷ The remainder of this article discusses specific recommendations for treating ED patients with bronchitis and sinusitis.

Acute Uncomplicated Bronchitis

Bronchitis is a term frequently misunderstood by physicians, and incorrect medical decision-making often arises from this confusion. Chronic bronchitis is overwhelmingly a disease of smokers and is not considered an infectious disease per se. Acute bronchitis can be broken down into two major categories: acute uncomplicated bronchitis and acute exacerbations of chronic bronchitis (AECB).

Acute uncomplicated bronchitis generally is defined as a respiratory tract infection of fewer than three weeks

duration in which cough is the predominant feature; there is no evidence of pneumonia, and the patient has no serious underlying lung disease or co-morbidities. In 90% of cases, acute uncomplicated bronchitis is viral in origin, and there is no evidence that antibiotic therapy improves outcomes or shortens the course of illness in such cases. The remaining 10% of cases usually have infections with atypical organisms—chlamydia, mycoplasma, and *Bordetella pertussis*. More serious infections with *Streptococcus pneumoniae*, *Haemophilus influenzae*, and *Moraxella catarrhalis* are very uncommon causes of bronchitis in healthy adults.⁸

Although antibiotic therapy is not a prerequisite for cure, it may shorten the course of acute uncomplicated bronchitis in patients who have atypical bacterial infections.⁹ Unfortunately, there are no signs or symptoms that distinguish patients with bacterial illnesses from patients with viral bronchitis, and it is obviously impractical to obtain sputum cultures in ED patients. Only duration of illness appears to distinguish patients with atypical bacterial bronchitis from those with viral infections. The literature supports the empiric antibiotic treatment of patients with prolonged bronchitis symptoms, generally considered more than 2-3 weeks in duration. Doxycycline or a second-generation macrolide (e.g., azithromycin or clarithromycin), would be appropriate for a patient with persistent symptoms. A respiratory fluoroquinolone (e.g., levofloxacin and gatifloxacin, not ciprofloxacin) would be effective but might be reserved for more serious infections.

It is important to note that smokers can—and often do—have acute uncomplicated bronchitis. The majority of smokers do not have chronic obstructive pulmonary disease (COPD), and every respiratory illness in a smoker should not be assumed to be AECB. Absent a diagnosis of COPD, a history of smoking does not influence the etiology of acute bronchitis, and there is no benefit to routinely prescribing antibiotics to smokers with a cough.

Acute Exacerbations of Chronic Bronchitis

There is considerable controversy surrounding antibiotic therapy for patients with AECB. Unfortunately, the diagnosis of AECB is neither uniform nor objective. Most experts refer to what is known as the working definition of AECB: increased sputum purulence, increased sputum volume, or worsening dyspnea in a patient with COPD.¹⁰ The average patient with COPD will have one to four episodes of AECB annually. Like uncomplicated bronchitis, there is an increased incidence of AECB in winter months. Unlike uncomplicated bronchitis, however, AECB is associated with considerable morbidity and mortality.

A bacterial etiology of AECB is likely in about half of cases, most commonly *H. influenzae*, *S. pneumoniae*, and *M. catarrhalis*. Pseudomonas infections are seen in patients with more severe disease. Bacterial infection is suggested by more severe exacerbations, generally associated with the presence of green or gray purulent sputum and a significant drop in peak expiratory flow rate.¹¹ It is important to recognize that patients with COPD may be colonized with bacteria, and recovery of a bacterial species in the sputum during an acute episode does not necessarily implicate the pathogen as the causative agent. Many experts, however, subscribe to the vicious circle hypothesis, which proposes that bacterial colonization leads to airway injury, which in turn enhances further bacterial colonization.¹² By ridding the airways of colonizing bacteria during acute exacerbations, the theory goes, antibiotic therapy shortens the course of the exacerbation and slows the inexorable progression of disease.

There have been surprisingly few careful studies of the benefit of prescribing antibiotics in AECB, and most were performed in the era before respiratory fluoroquinolones and newer macrolides. A meta-analysis from 1995 found only nine placebo-controlled, randomized trials that examined clinically meaningful outcomes.¹³ The majority of studies found a small but statistically meaningful benefit to prescribing antibiotics to patients with moderate-to-severe episodes of AECB. An expert panel currently recommends prescribing antibiotics to patients with COPD who note acute exacerbations with purulent sputum or increased dyspnea. Therapy in this group generally shortens the duration of illness by about two days and results in more rapid improvement in peak expiratory flow rate.¹⁰

There are no definitive answers regarding appropriate selection of antibiotics in patients with moderate-to-severe AECB. For AECB in patients with mild COPD and not recently taking antibiotics, amoxicillin-clavulanic acid, first-generation cephalosporins, and second-generation macrolides usually are appropriate. Treatment with respiratory fluoroquinolones, second-generation macrolides, or second- or third- generation cephalo-

sporins are appropriate in patients older than 55 years with frequent exacerbations, co-morbidities, or poor baseline airflow. Finally, patients with severe COPD and those with chronic production of purulent sputum may likely benefit from a fluoroquinolone with anti-pseudomonal properties (specifically ciprofloxacin and levofloxacin).¹⁰ ❖

References

1. Wenzel RP, et al. Managing antibiotic resistance. *N Eng J Med* 2000;343:1961-1963.
2. Gonzales RG, et al. Antibiotic prescribing for adults with colds, upper respiratory tract infections and bronchitis by ambulatory care physicians. *JAMA* 1997; 278: 901-904.
3. Stone S, et al. Antibiotic prescribing for patients with colds, upper respiratory tract infections, and bronchitis: A national study of hospital-based emergency departments. *Ann Emerg Med* 2000;36: 320-327.
4. Nyquist AC, et al. Antibiotic prescribing for children with colds, upper respiratory tract infections, and bronchitis. *JAMA* 1998;279:875-877.
5. Watson RL, et al. Antimicrobial use for pediatric upper respiratory infections: Reported practice, actual practice, and parent beliefs. *Pediatrics* 1999; 104: 1251-1257.
6. Karras, DJ, et al. Antibiotic use for emergency department patients with acute diarrhea: Prescribing practices, patient expectations, and patient satisfaction. *Ann Emerg Med* 2003;42:835-842.
7. Mainous AG, et al. Trends in antimicrobial prescribing for bronchitis and upper respiratory infections among adults and children. *Am J Public Health* 2003;93: 1910-1914.
8. Gonzales R, et al. Principles of appropriate antibiotic use for treatment of acute respiratory tract infections in adults: Background, specific aims, and methods. *Ann Emerg Med* 2001; 37: 690-697.
9. Edmonds ML. Evidence-based emergency medicine.

CME Objectives

To help physicians:

- Summarize the most recent significant emergency medicine-related studies;
- Discuss up-to-date information on all aspects of emergency medicine, including new drugs, techniques, equipment, trials, studies, books, teaching aids, and other information pertinent to emergency department care; and
- Evaluate the credibility of published data and recommendations.

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Physicians participate in this continuing medical education program by reading the article, using the provided references for further research, and studying the questions at the end of the article. Participants should select what they believe to be the correct answers, then refer to the list of correct answers to test their knowledge.

To clarify confusion surrounding any questions answered incorrectly, please consult the source material. After completing this activity, you must complete the evaluation form that will be provided at the end of the semester and return it in the reply envelope provided to receive a certificate of completion. When your evaluation is received, a certificate will be mailed to you.

Antibiotic treatment for acute bronchitis. *Ann Emerg Med* 2002; 40:110-112.

10. Grossman RF. Guidelines for the treatment of acute exacerbations of chronic bronchitis. *Chest* 1997;112: 310S-313S.
11. Stockley RA, et al. Relationship of sputum color to nature and outpatient management of acute exacerbations of COPD. *Chest* 2000;117:1638-1645.
12. Sethi S. Bacterial infection and the pathogenesis of COPD. *Chest* 2000;117:286S-291S.
13. Saint S, et al. Antibiotics in chronic obstructive pulmonary disease exacerbations: A meta-analysis. *JAMA* 1995;273:957-960.

Physician CME Questions

31. The Epley maneuver:

- a. works well in vertigo regardless of cause.
- b. seems to effectively reduce symptoms of benign positional vertigo.
- c. is not indicated if the patient has a history of vomiting.
- d. was shown to work better in children with benign positional vertigo than in adults with the same diagnosis.

32. In patients who present to the ED with first-trimester pregnancy and have a non-diagnostic pelvic ultrasound, the most common eventual diagnosis was found to be:

- a. fetal demise.
- b. ectopic pregnancy.
- c. normal intrauterine pregnancy.
- d. twin gestation.

33. An acute exacerbation of chronic bronchitis:

- a. should be presumed in all smokers with symptoms of bronchitis.
- b. may be treated appropriately with a respiratory fluoroquinolone.
- c. usually is characterized by a fever.
- d. is not treated appropriately with a macrolide drug.

34. A reasonable antibiotic choice in a 56-year-old patient with an acute exacerbation of chronic bronchitis and a history of COPD is:

- a. trimethoprim.
- b. ampicillin.
- c. nitrofurantoin.
- d. clarithromycin.

35. Agents that inhibit the metabolism of cytochrome P450 enzymes and thus may enhance QT-prolongation effects in other drugs include:

- a. some penicillin-related antibiotics.
- b. most beta-blocking agents.
- c. some calcium-channel antagonists.
- d. thiazolidinedione antidiabetic agents.

Answers: 31.b; 32. a; 33. b; 34.d; 35. c.

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The QRS Complex in Lead V₂

By Ken Grauer, MD

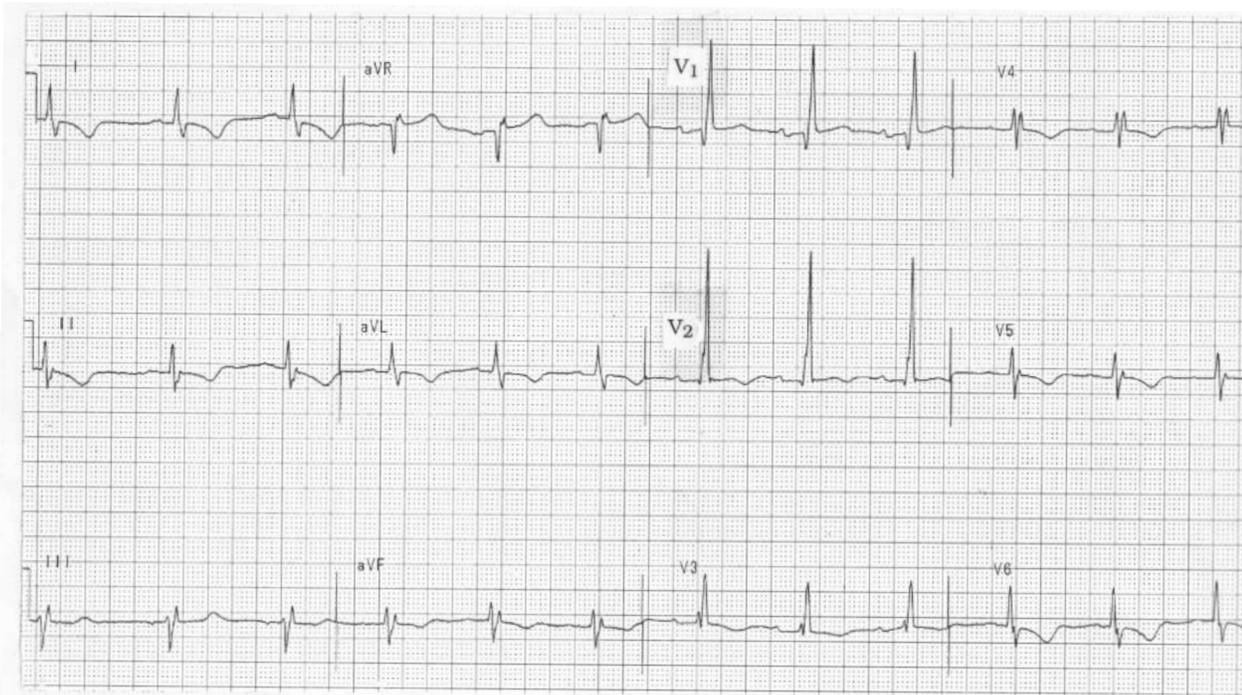


Figure. 12-lead ECG obtained from a 73-year-old man with dyspnea.

Clinical Scenario: The electrocardiogram (ECG) in the Figure was obtained from a 73-year-old man with documented coronary disease and heart failure. He now presents with a 10-day history of dyspnea. How would you interpret his ECG? How does the appearance of the QRS complex in lead V₂ contribute to your answer?

Interpretation: The rhythm is slightly irregular. Although the amplitude of P waves in the limb leads is greatly reduced, the rhythm is probably sinus (suggested by regularly occurring atrial activity in leads V₁, V₂, V₃). The QRS complex is widened. The pattern is most consistent with complete right bundle-branch block (RBBB) in view of the widened tall R wave in lead V₁ that occurs in association with wide terminal S waves in lateral leads I and V₆. The atypical feature of this RBBB pattern is the absence of an initial small r wave in lead V₁ (a QR pattern is seen, instead of a more typical rSR' pattern). Because a small (but definite) q wave is seen in lead V₂, one should strongly suspect septal infarction as the cause of the initial Q wave in those two precordial leads. Further support of our suspicion that the patient

has had an anterolateral infarction is supported by the presence of primary ST-T wave changes in each of the three key leads. Normally the direction of the ST segment and T wave in typical right or left bundle-branch block is opposite the direction of the last QRS deflection in each of the three key leads (leads I, V₁, and V₆). Thus, the T wave normally will be upright in both leads I and V₆ (opposite the wide terminal S wave in those leads), and the ST segment and T wave are likely to be negative in lead V₁ (opposite the positive R or R' complex). The contrary is true in this case; note especially the hint of ST-segment elevation in lead V₁. In addition, deep symmetric T-wave inversion is seen in leads II, aVL, aVF, and V₃ through V₆ of this tracing. The overall ECG picture, in conjunction with the history of heart failure in this 73-year-old man strongly suggest the possibility of recent ischemia and/or infarction superimposed on the underlying pattern of RBBB. Perhaps an event (e.g., a myocardial infarction) and/or ongoing ischemia precipitated this patient's most recent episode of dyspnea? ❖

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