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INSIDE

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Buckle Up — and Get at Least 7 Hours of Sleep Before You Drive

ABSTRACT & COMMENTARY

By Barbara A. Phillips, MD, MSPH

Professor of Medicine, University of Kentucky; Director, Sleep Disorders Center, Samaritan Hospital, Lexington

Dr. Phillips serves on the speaker's bureaus for Cephalon, Resmed, and Respironics.

Synopsis: *In a representative sample of Americans, about a third reported getting less than 7 hours of sleep on average, about half reported snoring, and nearly 5% reported falling asleep while driving in the past month.*

Source: McKnight-Eily LR, et al. Unhealthy sleep-related behaviors — 12 states, 2009. *MMWR Morb Mortal Wkly Rep* 2011;60:233-238.

To collect these data, the Centers for Disease Control and Prevention (CDC) added an optional sleep module to its annual Behavioral Risk Factor Surveillance System (BRFSS). BRFSS is a state-based, random-digit–dialed telephone survey of the U.S. adult population. This survey has been conducted by state health departments in collaboration with CDC for many years. Some components are compulsory and are included annually, and others may be voluntarily included by individual states if their health departments wish. In this survey, California, Georgia, Hawaii, Illinois, Kansas, Louisiana, Maryland, Minnesota, Nebraska, New York, Texas, and Wyoming included the optional sleep module. Response rates ranged from 40.0% in Maryland to 66.9% in Nebraska, and included 74,571 adults.

The questions about sleep (and instructions to the interviewer) were: "On average, how many hours of sleep do you get in a 24-hour period? Think about the time you actually spend sleeping or napping, not just the amount of sleep you think you should get (categorized as < 7 hours and ≥ 7 hours)." "Do you snore? (can have been told by spouse or someone else; categorized as yes or no)?" "During the past 30 days, for about how many days did you find yourself unintentionally falling asleep during the day (categorized as none or at least 1 day reported)?" and "During the past 30

days, have you ever nodded off or fallen asleep, even just for a brief moment, while driving (categorized as yes or no)?"

About a third of the respondents (35.3%) reported sleeping less than 7 hours on average during a 24-hour period. The highest rate of this behavior was in Hawaii (44.6%), and the lowest was in Minnesota (27.6%). People who were at least 65 years old were significantly less likely to report sleeping less than 7 hours (24.5%) than persons in any other age categories. Non-Hispanic blacks (48.3%) and non-Hispanic persons of other races (38.7%) were more likely to report sleeping less than 7 hours than non-Hispanic whites (34.9%). There were no differences in self-reported sleep duration between men and women. Non-working adults, those with at least some college education, and single people were significantly more likely to report getting less than 7 hours of sleep.

Snoring was reported by nearly half (48%) of respondents, and its prevalence generally increased with aging. Men (57%) were more likely to report snoring than women (40%). And this survey demonstrates one of the problems with the epidemiologic estimation of snoring prevalence. Those who were married/partnered were more likely to report snoring than those who presumably slept alone, which is sort of like saying that if a tree falls in the forest and there's no one there to hear it, it doesn't make a sound.

About 38% of adults reported unintentionally falling asleep during the day at least once in the preceding month. This behavior was most likely in those between 18–24 years and those over 65 years. Again, there were no differences between men and women in the frequency of this behavior. Those who were unemployed, unable to work, or homemakers/students were significantly more likely to report unintentionally falling asleep during the day, but those with at least some college education were less likely to report unintentionally falling asleep than those with less education. Never married adults (43%) were significantly more likely to report unintentionally falling asleep during the day than married adults (36%). Those who reported getting less than 7 hours a night were more likely to report accidentally falling asleep during the day at least once in the previous month.

Nearly 5% of the respondents reported falling asleep while driving in the month before the survey. People who were 65 years or older (2%) were much less likely to report this behavior than persons aged 25–34 years (7%). Hispanics, non-Hispanic blacks, and non-Hispanics of other races all were significantly more likely to report this behavior than non-Hispanic whites. Men were more likely (5.8%) to say they had fallen asleep while driving compared to women (3.5%). No significant differences were observed by educational level or marital status. Those who reported getting less than 7 hours a night were more than twice as likely (7.3 vs. 3.0%) to report falling asleep while driving in the previous month.

■ COMMENTARY

Sleepiness is a problem when it interferes with daily activities. Falling asleep while driving is not just a personal problem, but a public health problem, since it endangers people besides the driver. In that regard, it's useful to look at this report with an eye to the factors associated with falling asleep while driving. Some are preventable, and some are not. Male gender, non-white race, and youth are the immutable factors associated with drowsy driving in this report. Being employed and sleeping less than 7 hours a night were potentially reversible factors associated with falling asleep while driving. These kinds of findings are tricky; for example, it is possible (likely, even) that those who work do more driving than those who don't. And the survey did not include questions about shift work, an important risk factor for crash. I am not suggesting that people should quit their jobs and get more sleep. But I do think that we need to query those who report drowsy driving about their sleep, and point out that sleep duration predicts sleepiness and drowsy driving (not just in this report, but in many others).[1,2] So, take home message No. 1 is that people who report drowsy driving should be asked how much sleep they get at night. And remember, 7 hours is sort of a minimum. Some of us need more.

This report also includes estimates of snoring prevalence. Nearly HALF of Americans snore! As expected, snoring is more likely in men and in older people. I wish the investigators had investigated the relationship between snoring and some other data available on the BRFSS, such as Body Mass

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Questions & Comments
Please call **Neill Kimball**, Managing Editor, at (404) 262-5404.

Index, drowsy driving, alcohol intake, and smoking status, all of which are likely to be correlated with snoring.[3]

But a caveat is in order. In this population, more people reported getting 7 hours of sleep a night than any other category (e.g., 6 or 8 hours). And there are many, many studies demonstrating a U-shaped relationship between sleep duration and a gamut of outcomes including cardiovascular disease, obesity, and death.[4-7] In most of these studies, the best outcomes are for those who report sleeping 7 or 8 hours a night. Sleep may be like calories: we need enough (which is variable among individuals, but probably about 7 or 8 hours), but too much is also associated with bad outcomes. ■

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Is Vitamin D Important in the Prevention of Dementia?

ABSTRACT & COMMENTARY

By Michael Lin, MD

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Dr. Lin reports no financial relationships relevant to this field of study.

This article originally appeared in the March issue of Neurology Alert. *At that time it was peer reviewed by M. Flint Beal, MD, Anne Parrish Titzel Professor, Department of Neurology and Neuroscience, Weill Cornell Medical Center, New York, NY. Dr. Beal reports no financial relationship to this field of study.*

Synopsis: *Severe Vitamin D deficiency appears to worsen dementia and supplementation may be beneficial.*

Sources: Llewellyn DJ, Lang IA, Langa KM, et al. Vitamin D and risk of cognitive decline in elderly persons. *Arch Intern Med* 2010;170:1135-1141. Evatt ML. Vitamin D and cognitive decline in elderly persons: Further details. *Arch Neurol* 2010;67:1513-1515.

Vitamin D recently has been associated with a range of conditions other than osteopenia, including neurologic diseases such as multiple sclerosis. There is also reason to suspect that vitamin D may play a role in cognitive decline. Several previous cross-sectional studies have found an association between vitamin D and cognition in elderly subjects, although this finding has not been consistent. Llewellyn and colleagues have now published the first prospective study examining vitamin D and cognition in elderly subjects, and found that low vitamin D levels were associated with increased risk of substantial cognitive decline.

The authors examined adults 65 years or older enrolled in the InCHIANTI study, a prospective population-based cohort study conducted in Tuscany between 1998 and 2006, with follow-up assessments every 3 years. A total of 858 subjects consented and completed blood draws and at least one follow-up assessment, with a mean (± SD) follow-up of 5.2 ± 1.3 years. The study measured 25-hydroxyvitamin D (25(OH)D) levels, and cognition assessed using the Mini-Mental State Exam (MMSE) and Trail Making Tests A and B. Substantial decline was defined as a drop of 3 or more points on the MMSE, or the worst 10% of the distribution of decline on the Trail Making Tests, or discontinuation due to excessive mistakes.

The relative risk of substantial decline on the MMSE in subjects with severe vitamin D deficiency (25(OH)D < 25 nM) compared to subjects with sufficient vitamin D levels (25(OH)D > 75 nM) was 1.60 (95% confidence interval [CI] 1.19-2.00). For the same groups, the relative risk of substantial decline on Trails B was 1.31 (95% CI 1.03-1.51). For both the MMSE and Trails B, the P values for a linear trend were statistically significant, suggesting a dose-response relationship. No association was seen for Trails A. All associations remained significant after extensive adjustment for confounding factors that might affect cognition or vitamin D levels (age, sex, education, baseline cognitive score, season tested, smoking, depression, body mass index, alcohol consumption, caloric intake, vitamin E level, mobility) or factors that might potentially mediate an association between vitamin D and neurologic status (stroke, diabetes, hypertension).

■ COMMENTARY

This study has a number of strengths. It is the first

prospective study of vitamin D and cognition in elderly subjects, with straightforward design and well-recognized endpoints. It was large, and the investigators were able to adjust for a wide range of confounding variables. In particular, it is unlikely that the observed association was due to reverse causation; i.e., that baseline dementia or impaired mobility reduced vitamin D levels by affecting diet or exposure to sunlight. On the other hand, the study was geographically confined, and all participants were of white European origin. Replication in other locales and populations is necessary. Moreover, the specific causes of cognitive decline were not assessed.

The authors review a number of biologic studies implicating vitamin D in neurologic function and supporting its potential involvement in neurodegeneration. Neurons and glia express vitamin D receptors and enzymes involved in vitamin D metabolism. Vitamin D affects neuronal calcium levels, reduces oxidative stress by inhibiting inducible nitric oxide synthase and increasing glutathione levels, and regulates the synthesis of neurotrophic factors and stimulates neurogenesis. Vitamin D is an immunosuppressor and may reduce autoimmune damage. Vitamin D also stimulates Aβ phagocytosis and clearance by macrophages, and protects against apoptosis. On the other hand, caution is necessary, as excessive vitamin D intake has a number of adverse effects, including renal toxicity and potentially pancreatic cancer. ■

Physician Communication Practices: Analysis Using Simulation-based Case Content

By Leslie A. Hoffman, RN, PhD

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Dr. Hoffman reports no financial relationship to this field of study.

This article originally appeared in the March issue of Critical Care Alert. *At that time it was peer reviewed by William Thompson, MD, Associate Professor of Medicine, University of Washington, Seattle. Dr. Thompson reports no financial relationship to this field of study.*

Synopsis: *An encounter with a critically ill simulated "patient" was used successfully to analyze the communication skills of experienced physicians and identify areas for improving communication behaviors.*

Source: Mohan D, et al. Communication practices in physician decision-making for an unstable critically ill patient with end-stage cancer. *J Palliat Med* 2010;13:949-956.

Successful shared decision-making requires three key elements: identifying patient preferences, clearly explaining pertinent medical information, and developing consensus around a treatment plan. Although many physicians have developed skills that incorporate these elements, others experience difficulty supporting and incorporating patient preferences in the plan of care. This study was conducted to evaluate the potential of using a standardized coding process to analyze the communication behaviors, communication skills, and treatment decisions of physicians in the setting of end-of-life decision-making for a critically ill patient.

Subjects were 27 physicians, with a mean age of 41 years, who had been practicing for a mean of 15 years since graduation from medical school. All were employed in an academic setting and had clinical practice responsibilities. Of these, 13 (48%) were hospitalists, eight (30%) intensivists, and six (22%) emergency physicians. The physicians were introduced to the 78-year old "patient" in a simulation room that resembled a monitored acute care unit. The patient, who had widely metastatic gastrointestinal cancer (CT scan), was recently discharged from the hospital and now admitted with sudden onset of life-threatening hypoxemia. A spiral CT was negative for pulmonary embolism. The chart did not include an advanced care plan; however, if probed, the patient and wife revealed a long-standing preference for avoiding intubation and ICU readmission and for comfort-based treatment.

Most physicians (81%) tried to elicit the patient's preferences, values, and goals, and asked if the patient or wife had questions about the proposed treatment plan (70%). However, few (7%) used behaviors considered best practices for shared decision-making. Eight physicians elected to admit the patient to the ICU and 16 initiated palliation. There was no relationship between physician characteristics (years since graduation, race, gender, specialty) and scores for communication skills.

■ COMMENTARY

Typically, simulation is used to perfect complex skills or develop competence in skills that are critical in a life-threatening situation, but may be rarely encountered, e.g., intubation with a difficult airway. Trained simulated patients also are used to perfect skills of medical students in differential diagnosis and treatment planning. This study used simulation facilities in combination with a trained standardized patient to create a setting that required high level communication skills to elicit and confirm patient preferences in the setting of a sudden deterioration in status. The patient had previously indicated a strong preference for avoiding aggressive treatment, but this was not clear without probing.

Today, one in five U.S. citizens dies using ICU services, despite evidence that many Americans prefer less aggressive treatment. Many studies have analyzed the content and

topics addressed in ICU family conferences directed toward clarifying end-of-life preferences. Findings suggest that there is room for improvement in clinician ability to elicit preferences and support decision-making. Part of the problem likely results from the situation: Such discussions are inherently difficult and there is no good way to gain expertise aside from observing experts, which is not always possible.

The scenario tested in this study represents a novel way of promoting the development of expert communication skills in such difficult situations. Using simulation, one can record the interaction, debrief those involved, and offer expert guidance to improve communication skills. As with use of simulation to develop other complex skills, scenarios of this type offer the opportunity to perfect skills that are difficult to attain, but frequently required in critical care practice. ■

Curious Brief Report

Do I Smell a Rat — Smelling TB?

By Carol A. Kemper, MD, FACP

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Dr. Kemper does research for Abbott Laboratories and Merck.

This article originally appeared in the February issue of Infectious Disease Alert. *At that time it was peer reviewed by Timothy Jenkins, MD, Assistant Professor of Medicine, University of Colorado, Denver Health Medical Center. Dr. Jenkins reports no financial relationship to this field of study.*

Source: Poling A, et al. Using giant African pouched rats to detect tuberculosis in human sputum samples: 2009 findings. *Am J Trop Med Hyg* 2010;83:1308-1310.

As reported in 2003, the World Bank began funding a project to train giant pouched Gambian rats to sniff out tuberculosis (TB) in sputum specimens in sub-Saharan Africa. Rats have been successfully trained to target landmines, and using a similar training/reward technique, pilot data suggested that rats could be trained to detect TB in respiratory specimens. Compared to a trained technician (~ 95% accuracy), preliminary data in 2003 suggested the rats were able to detect TB in 92% of smear-positive cases and 77% of culture-positive cases, with a 2% false-positive rate.

The rats have since gotten better. Although trained technicians were able to identify AFB in 13.3% of 10,523 respiratory specimens by light microscopy, the rats were able to detect an additional 600 cases. When multiple rats were allowed to pause for 5 seconds over each specimen, the specificity improved to 89%. All it takes is training — and bananas. Compared to a trained technician, who can process about 20 specimens in a day, the rats are much more efficient — but they don't do any clean up. ■

Pharmacology Update

Vilazodone Hydrochloride Tablets (Viibryd™)

By William T. Elliott, MD, FACP, and James Chan, PharmD, PhD

Dr. Elliott is Chair, Formulary Committee, Northern California Kaiser Permanente; and Assistant Professor of Medicine, University of California, San Francisco. Dr. Chan is Pharmacy Quality and Outcomes Manager, Kaiser Permanente, Oakland, CA.

Drs. Elliott and Chan report no financial relationship to this field of study.

A new antidepressant that combines selective serotonin reuptake inhibition with partial agonism of the 5-HT_{1A} receptor has been approved by the FDA. Vilazodone is marketed by Trovis Pharmaceuticals as Viibryd™.

Indications

Vilazodone is indicated for the treatment of adults with major depression disorder.[1]

Dosage

The initial dose is 10 mg once daily for 7 days, then 20 mg once daily for 7 days, and increased to 40 mg once daily. The tablets should be taken with food to ensure adequate drug absorption.[1] The dose should be reduced if given concomitantly with a strong CYP3A4 inhibitor (e.g., ketoconazole). The concomitant administration with a CYP3A4 inducer may reduce the effectiveness of vilazodone.[1] Vilazodone may increase the level of drugs metabolized by CYP2C8.[1]

Potential Advantages

Vilazodone appears to have minimal effect on sexual dysfunction and does not prolong the QTc interval.[2]

Potential Disadvantages

The absorption of vilazodone is highly affected by food. Taking the drug under fasting condition reduces the plasma level by approximately 50% compared to the postprandial condition.[1] The most common adverse reactions associated with vilazodone (vs. placebo) are diarrhea (28% vs. 9%) and nausea (23% vs. 5%).[1]

Comments

Vilazodone is a dual-acting serotonergic antidepressant. The efficacy was shown in two 8-week, randomized, double-blind, placebo-controlled studies in adults with major depressive disorder.[1,2] Study participants were randomized to vilazodone (titrated up to 40 mg daily over 2 weeks; n = 435) or placebo (n = 433). The primary efficacy endpoint was the

mean change from baseline to week 8 on the Montgomery-Asberg Depression Rating Scale (MADRS). The least square mean differences from placebo were -3.2 (95% confidence interval [CI], -5.2 to -1.3) for Study 1 and -2.5 (95% CI -4.4 to -0.6) for Study 2. A statistically significant difference was observed at week 1.[2] The most common adverse effects were diarrhea and nausea. These were generally mild to moderate in intensity, occurred during the first week, and with a median duration of 4-5 days.[2] Overall, 7.1% of patients discontinued participation in the clinical trial compared to 3.2% for placebo.[1] In those with adverse effects, 8.8% randomized to vilazodone had adverse effects considered to be severe compared to 5.4% for placebo.[3] Sexual dysfunction was assessed with the Arizona Sexual Experience Scale (ASEX). Sexual dysfunction was not associated with vilazodone treatment in this study.[2] Overall, in placebo-controlled studies, the frequencies of decreased libido ranged from 2% to 5% in males and 3% or less for females compared to 0% to 1% for placebo.[1] Less frequent events included abnormal orgasm, and delayed ejaculation and erectile dysfunction in males. As with other serotonergic antidepressants, there is a box warning for suicidal thinking and precaution regarding abrupt discontinuation of the drug.

Clinical Implications

Vilazodone is the newest serotonergic antidepressant to enter a crowded market, but is the only one that acts as a serotonin reuptake inhibitor and partial agonist for 5-HT_{1A} receptor. 5-HT_{1A} receptor agonists, such as buspirone, have been used to augment the effect of antidepressants particularly in patients with anxiety.[4,5] Its low incidence of sexual dysfunction is encouraging. However, it is not known whether vilazodone offers any clinical advantage over other antidepressants since direct comparative studies have not been published. Until this has been established, vilazodone is another antidepressant with a "novel" dual mechanism of action. ■

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CME Questions

14. In the Behavioral Risk Factor Surveillance Survey, increased likelihood of falling asleep while driving was reported by:
a. men as compared to women.
b. people over 65 compared with younger people.
c. those who got 7 hours of sleep a night compared with those who got less.
d. non-Hispanic whites, compared with Hispanics, non-Hispanic blacks.

15. All of the following are true about vitamin D *except*:
a. light exposure is needed for endogenous vitamin D synthesis.
b. vitamin D reduces oxidative stress.
c. patients with severe vitamin D deficiency have more rapid cognitive decline.
d. vitamin D supplements can cure dementia.

16. Simulation can be utilized to perfect complex skills or to develop competence in critical but infrequently encountered situations, including which of the following?
a. Difficult intubation
b. Developing differential diagnosis
c. Improving communication in end-of-life care planning
d. All of the above

Answers: 14. a; 15. d; 16. d

CME Objectives

Upon completion of this educational activity, participants should be able to:

- describe new findings in the differential diagnosis and treatment of various diseases;
- describe the advantages, disadvantages and controversies surrounding the latest advances in the diagnosis and treatment of disease;
- identify cost-effective treatment regimens;
- explain the advantages and disadvantages of new disease screening procedures.

Clinical Briefs

By Louis Kuritzky, MD, Clinical Assistant Professor, University of Florida, Gainesville

Dr. Kuritzky is an advisor for Endo, Kowa, Pricara, and Takeda.

Do Topical Steroids Lead to Glaucoma or Cataract?

Source: Haeck IM, et al. Topical corticosteroids in atopic dermatitis and the risk of glaucoma and cataracts. *J Am Acad Dermatol* 2011;64:275-281.

The treatment of atopic dermatitis (ATD) usually is initiated with topical steroids (TPS). Because ATD is a chronic remitting and relapsing disorder and may occupy a large cutaneous area, exposure to TPS can be extensive. Since both glaucoma and cataracts are associated with ophthalmic TPS, and ATD may require periocular application of TPS, it is important to learn whether non-ophthalmic utilization of TPS could lead to increased intraocular pressure. The use of inhaled steroids for asthma has been associated with development of cataracts, but not glaucoma.

To study the impact of TPS in ATD upon glaucoma and cataract, 88 adults with chronic ATD were evaluated. For each study subject, data on total amount of TPS prescribed over the last 2-5 years was available. Two-thirds of the study subjects had applied TPS in the periocular region, since they suffered from ATD on the eyelids and periorbital region. The authors cite the average amount of periocular TPS use within this group as "3.9 days/week, 6.4 months/yr, for 4.8 years."

There was no sign of increased incidence of glaucoma among TPS users. Corticosteroid-induced cataract was seen in 2 of the 88 subjects, both of whom had received courses of systemic steroids in addition to TPS. These data are reassuring that TPS application does not appear related to the development of glaucoma or cataracts, even when TPS needs to be applied in the periorbital region. ■

Can Exenatide Prevent Glucocorticoid-Induced Hyperglycemia?

Source: Van Raalte DH, et al. Glucagon-like peptide-1 receptor agonist treatment prevents glucocorticoid-induced glucose intolerance and islet-cell dysfunction in humans. *Diabetes Care* 2011;34: 412-417.

Clinicians anticipate that administration of systemic glucocorticoids, such as prednisone (PRED), to persons with diabetes worsen hyperglycemia. PRED reduces insulin sensitivity and impairs beta-cell function, resulting in hyperglycemia.

Chronic PRED administration is associated with increased risk for osteoporosis and peptic ulcer; preventive strategies for each of these adverse effects has been developed. To date, no such plan for mollifying exaggerated glucose excursions due to PRED has been offered.

The glucose dysregulation secondary to PRED appears to be primarily postprandial, rather than fasting. Clinical trials of metformin failed to confirm efficacy in preventing glucocorticoid-induced hyperglycemia (GIH). Because exenatide (EXE) has prominent effects specifically on postprandial glucose, it was logical to investigate whether EXE might favorably impact GIH.

Healthy adult men (n = 8) received a PRED load of 80 mg orally for two days (prednisolone, actually, but prednisone and prednisolone are mg-for-mg equivalent). They were randomized to also receive placebo or EXE. GIH was prevented by concomitant EXE administration.

This proof-of-concept trial should stimulate further investigation to determine whether the demonstrated ability of EXE to prevent GIH is similarly favorable in diabetics. ■

COPD: Beyond Pulmocentricity

Source: Nussbaumer-Ochsner Y, Rabe KF. Systemic manifestations of COPD. *Chest* 2011;139:165-173.

Chronic obstructive pulmonary disease (COPD) generally is regarded as a pulmonary process induced by toxic insult — usually cigarettes, but sometimes other environmental exposures. Why only a small subset of chronic smokers develops COPD (20-25%) remains a mystery. Progressive loss of pulmonary function continues even after smoking cessation, suggesting that some inflammatory process, once set in gear in susceptible individuals, becomes self-perpetuating.

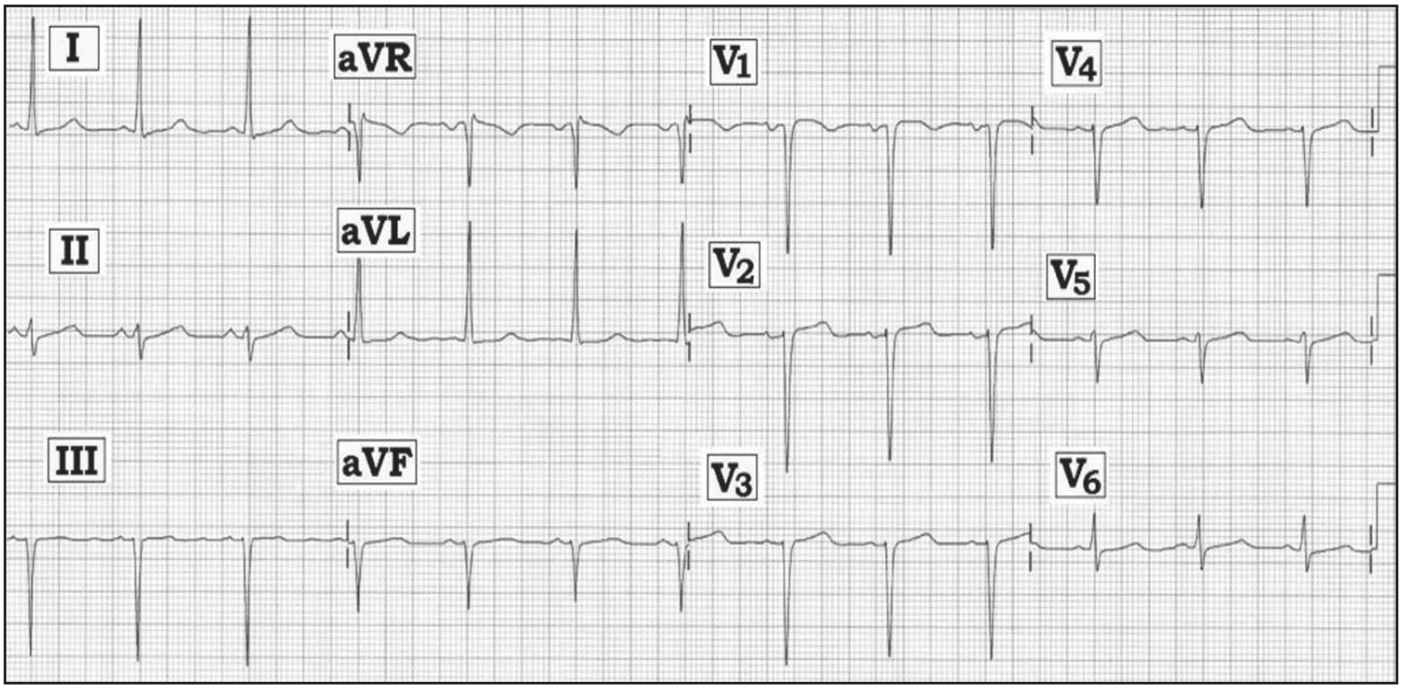
Experts recognize other non-pulmonary tissue compartments are involved in COPD. Musculoskeletal wasting, metabolic syndrome, and depression are disproportionately comorbid with COPD. Biopsy studies have found increased inflammatory cytokines in intercostal muscles, providing an explanation for dyspnea that goes beyond simple damage to alveolar capacity for gas exchange.

Both diabetes and chronic kidney disease have been found to be associated with COPD. In the absence of a visible etiologic link, systemic inflammation is a suspected culprit. Indeed, early data indicate that smoking cessation slows progression of renal failure. In reference to diabetes, smoking cessation is associated with short-term worsening of diabetes risk, attributed to the weight gain commonly seen after smoking cessation. COPD is increasingly viewed as part of a systemic process. ■

Has There Been Anterior Infarction?

By Ken Grauer, MD, *Professor Emeritus in Family Medicine, College of Medicine, University of Florida*

Dr. Grauer is the sole proprietor of KG-EKG Press, and publisher of an ECG pocket brain book.



Scenario: The ECG above was obtained in the office from an older woman with hypertension and atypical chest discomfort. Has there been anterior infarction, or is this a "pseudo-infarct" pattern?

Interpretation: The ECG shows normal sinus rhythm at 75/minute. The PR, QRS, and QT intervals are normal. There is marked LAD (left axis deviation). Criteria for LAHB (left anterior hemiblock) are met, given that the QRS complex in lead II is predominantly negative (which puts the axis at approximately -40 degrees). Criteria for LVH (left ventricular hypertrophy) are met in lead aVL, with QRS amplitude in this lead clearly exceeding the required 12 mm. The interesting aspect about R wave progression is that there is "loss of R wave" between leads V2-to-V3. Transition is delayed, and does not occur until between leads V5-to-V6. S waves persist through to leads V5,V6. ST-T waves show nonspecific flattening, but no acute changes. This probably reflects a "strain equivalent" in lead aVL given the very tall R wave in this lead.

Several conditions may account for "loss" of R wave in the anterior leads. The two most common are anterior infarction and lead placement errors. Two less common causes are "competing conditions" of LVH and LAHB. Occasionally when there are very tall R waves in lateral precordial leads — these forces may overcome the forces of normal R wave progression. Although voltage criteria for LVH are easily met in lead aVL, lateral precordial lead amplitude is small.

A much more likely cause of the poor R wave progression seen here is LAHB. Anatomically, the posterior hemifascicle lies slightly behind the left anterior hemifascicle. Consequently, block in the anterior hemifascicle may result in predominance of posterior precordial forces, leading to "loss of R wave" in anterior precordial leads. That said, it is impossible to tell from this single tracing if there has been prior anterior infarction, or if all changes are due to LAHB. ■

In Future Issues:

Measuring Blood Pressures in Your Office

Aspirin and Risk of Death from Cancer