Treating Essential Hypertension

1. I have heard that there are some advantages to the concomitant use of both ACE inhibitors and ARBs in treating essential hypertension. What are the pros and cons of this approach?

Question submitted by: Dr. Jerry Graner, Toronto, Ontario

Voltaire said, "Doctors pour drugs of which they know little, into patients of whom they know less, for diseases of which they know nothing." While this may seem like a rather harsh criticism, especially the bit about "knowing nothing," in the practice of combining medications, we need to be cautious.

Both ACE inhibitors and ARBs have been shown to reduce target organ damage in the kidneys, brain and heart and reduce CV morbidity and mortality by inhibiting the renin-angiotensin system (RAS) –a central player in the pathogenesis of CV disease. It makes theoretical sense that adding them together would provide greater antihypertensive efficacy and end-organ protection than use of either class alone. This approach has been shown to be beneficial in the treatment of patients with heart failure and in individuals with proteinuric nephropathies. For example, in the Candesartan in Heart Failure (CHARM) and the Valsartan Heart Failure Trial (Val-HeFT), the addition of an ARB to an ACE inhibitor reduced cardiac mortality and hospital admissions in patients with severe heart failure. However, the contention that "if one RAS blocker is good, two must be better" has come under criticism. In the Ongoing Telmisartan Alone and in Combination with Ramipril Global Endpoint Trial (ONTARGET) study, combined RAS blockade achieved no further benefit in high-risk vascular patients and was associated with more adverse events. Therefore, vigilance is needed when combining ACE inhibitors with ARBs, since both classes of medications can potentially alter serum electrolytes and impair renal function in susceptible patients. Patients receiving dual therapy should be monitored closely for potential adverse effects, particularly during the initiation and titration phases.

Resources

1 Young JB, Dunlap ME, Pfeffer MA, et al: Mortality and Morbidity Reduction With Candesartan In Patients With Chronic Heart Failure and Left Ventricular Systolic Dysfunction: Results Of The CHARM Low-Left Ventricular Ejection Fraction Trials. Circulation 2004; 110(17):2618-26.

2 Cohn JN, Tognoni G: Valsartan Heart Failure Trial Investigators: A Randomized Trial Of The Angiotensin-Receptor Blocker Valsartan In Chronic Heart Failure. N Engl J Med. 2001; 345(23):1667-75.

3 Werner C, Baumhäkel M, Teo KK, et al: RAS Blockade With ARB And ACE Inhibitors: Current Perspective On Rationale And Patient Selection. Clin Res Cardiol 2008; 97(7):418-31.

4 ONTARGET Investigators, Yusuf S, Teo KK, et al: Telmisartan, Ramipril, Or Both In Patients At High Risk For Vascular Events. N Engl J Med. 2008; 358(15):1547-59.

Answered by:
Dr. Theodore Fenske

Coronary Calcium Screening Tests

2. When should a coronary calcium screening test be considered?

Question submitted by: Dr. David Hawkins, Kelowna, British Columbia

Coronary artery calcium scoring (CACS) is performed by quantification of the amount of coronary calcification detected by a low-dose CT scan of the heart. The CACS serves as a surrogate marker for the atherosclerotic burden, as atherosclerosis tends to calcify, whilst normal vessels do not. Unfortunately, 5% to 15% of individuals with no coronary calcification have some noncalcified atherosclerosis. CACS has been shown to be highly predictive of future CV events and to provide incremental prognostic ability at all levels of Framingham risk.

The procedure requires a single breath hold, does not require IV contrast and is associated with a radiation dose of 0.5 millisieverts (mSv) to 2.0 mSv (by way of comparison, the annual background radiation dose is approximately 3 mSv).

The recently published Canadian Cardiovascular Society/Canadian Association of Radiology position paper on cardiac CT recommends that CACS be considered for intermediate risk asymptomatic patients in whom the test outcome would change management. For example, a 55-year-old asymptomatic hypertensive man with moderate dyslipidemia; if his CACS score was zero, then it would be reasonable to treat his dyslipidemia conservatively, but if his score was 260 (placing him above the 90th centile for his age and gender), then many cardiologists would advocate starting him on a statin. In my practice, I seldom order CACS, as full coronary CT angiography (CCTA), which quantifies both calcified and noncalcified plaque, can be performed at St. Paul's Hospital/Providence Heart and Lung Institute with a radiation dose of approximately 1 mSv by utilizing the latest CT technology. However, CCTA is less reliable in patients with an irregular heart rate (*e.g.*, atrial fibrillation) and is not advisable in the setting of renal dysfunction owing to the requirement for IV contrast. The use of CCTA in asymptomatic patients is not yet supported by guidelines, mainly because the radiation dose at most centres in Canada is in the 5 mSv to 20 mSv range.

Answered by:
Dr. Brett Heilbron

Occasional Supraventricular Tachycardia

3. What treatments, medications and consults are needed for occasional supraventricular tachycardia?

Question submitted by: Dr. Steven Kravcik, Cresent, Ontario

The term supraventricular tachycardia covers a wide variety of events. These include sinus tachycardia, reentrant junctional tachycardia, ectopic atrial tachycardia, paroxysmal atrial fibrillation and paroxysmal atrial flutter. Management of paroxysmal atrial fibrillation and atrial flutter has been covered in several recent answers.

For the sake of brevity, I am going to assume that your question relates to an otherwise healthy person who has episodes of palpitations that have been shown to be a narrow complex supraventricular tachycardia. If these episodes are quite rare, not very symptomatic and self-limiting, it is important to document the type of tachycardia and to document that there is no significant structural heart disease by a careful examination, an ECG and an ECHO. We must also rule out underlying disease such as thyrotoxicosis, febrile illnesses, *etc*.

It is also important to discuss potential triggers for supraventricular tachycardias such as excessive caffeine and alcohol.

If there is no underlying heart disease or illness, no treatment might be best for rare events that are self-limiting. As the symptoms become more severe or more frequent, in addition to counselling about avoiding caffeine, alcohol and excessive fatigue medication should be considered. At this stage, I think it would be wise to seek the advice of a cardiologist. While waiting for that appointment, it is safe to try medications such as a β-blockers to decrease the episodes or the severity of the attacks. More potent medications such as propafenone, sotalol, procainamide, or amiodarone should be reserved for more severe episodes of supraventricular tachycardia and should be prescribed with the assistance of a specialist. This is especially important if there are underlying abnormalities such as a pre-excitation syndrome (*e.g.*, Wolf-Parkinson-White syndrome). In all cases where symptoms are significant and medications are not effective or tolerated, it is recommended that you refer for consideration of ablation therapy.

Answered by:
Dr. Wayne Warnica

ECHOs for Congestive Heart Failure Patients

4. GPs are advised to obtain an ECHO in our patients clinically diagnosed with congestive heart failure. Should ACE inhibitors or β-blockers be the first choice (with diuretics for symptom relief) while we await the ECHO?

Question submitted by: Dr. S. Grynspon, Toronto, Ontario

Ordinarily I would obtain an ECHO prior to starting either. First, the baseline ventricular function ejection fraction (EF) has important prognostic implications. Secondly, you may find contraindications to ACE inhibitors such as critical aortic stenosis. Finally, if the ECHO shows low EF, an ACE inhibitor should be given first. If the EF is "preserved," a β-blocker would make more sense.

Answered by:
Dr. Thomas Wilson

Relation of Heart Disease to Peripheral Arterial Disease

5. How commonly is heart disease associated with peripheral arterial disease (PAD)?

Question submitted by: Dr. David Hawkins, Westbank, British Columbia

For someone with known PAD, the risk of having coronary artery disease, a heart attack, stroke, or transient ischemic attack is six to seven times greater than the risk for people who do not have PAD. On the other hand, if you have coronary heart disease (CHD), you have at least a 30% chance of having PAD.

A quick, noninvasive and sensitive method of checking for the presence and severity of PAD at bedside is with the ankle-brachial index space (ABI).

Some studies have shown that patients with ABI-defined PAD (defined as ABI < 1.0) are one point five times more likely to have a clinical ischemic heart disease event than those without PAD.

In recent guidelines set out by the Adult Treatment Panel III, ABI < 0.9 is considered a CHD risk equivalent (10-year CHD risk > 20%). A large population study has recently shown that the more severe the PAD, the higher the average CHD risk (the severity of CHD increased exponentially as ABI decreased < 0.9). Patients with symptomatic PAD, which almost certainly means severe PAD, should be considered and treated as if they have known CHD.

Answered by:
Dr. Wayne Warnica

Following Hemoglobin

6. Should Hemoglobin (Hgb) be followed? Is there a trade-off in congestive heart failure (CHF)?

Question submitted by: Dr. Patricia Menard, Antigonish, Nova Scotia

Anemia is common in heart failure (HF) patients and portends a poor prognosis. A recent study demonstrated that for each 1 g/dl decrease in Hgb, there was a 20% increase in the multivariate adjusted risk of death. What is uncertain is whether anemia is a marker or is a mediator of the adverse prognosis.

The prevalence of anemia is higher with advanced New York Heart Association functional class, older age, worse renal function and more comorbidities.

Cardiologists have only lately started to recognize, evaluate and treat anemia. Tang, *et al* found that < 20% of all anemic HF patients had a laboratory evaluation for the anemia and only 30% had a repeat Hgb within six months.

We do not know whether treatment for anemia with IV iron or erythropoiesis stimulating proteins (ESPs) reduces the risk associated with anemia. IV iron therapy is being studied in a large randomized trial, Iron Supplementation in Heart Failure Patients With Anemia (IRON-HF). Phase 2 clinical trials of anemia in HF patients (n=475 patients) have shown that ESPs can increase Hgb, improve HF symptoms and improve exercise capacity and may reduce morbidity/mortality (hazard ratio 0.67, 95% confidence interval 0.44 to 1.03, p=0.07). This hypothesis is being tested in an ongoing trial, the Reduction in Events with Darbepoetin Alpha in Heart Failure (RED-HF) trial, a double-blind randomized trial in 3,400 anemic New York Heart Association functional class II to IV systolic HF patients.

If anemia persists, evaluation and treatment of the underlying cause is appropriate.

Resources
1. Tang WH, Tong W, Jain A, et al: Evaluation And Long-Term Prognosis Of New-Onset, Transient And Persistent Anemia In Ambulatory Patients With Chronic Heart Failure. J Am Coll Cardiol 2008; 51(5):569-76.
2. Levy WC: Anemia In Heart Failure: Marker Or Mediator Of Adverse Prognosis? J Am Coll Cardiol 2008; 51(5):577-8.

Answered by:
Dr. Brett Heilbron

White Coat Hypertension

7. When is treatment indicated and how do we follow the BP if a patient is diagnosed with white coat hypertension (WCH)?

Question submitted by: Dr. Angelo Bourkas, Montreal, Quebec

Patients with WCH have elevated BP when measured in healthcare settings but normal BP otherwise. Although there is conflicting data regarding the clinical significance of WCH, it is generally regarded as conferring a risk which is intermediate between that of normotensive and truly hypertensive individuals.

The Canadian Hypertension Education Program advises that the management of hypertension should involve a global CV risk assessment, with drug therapy targeted towards those most likely to benefit. Evidence of macrovascular target organ damage, diabetes mellitus and/or chronic kidney disease requires earlier and more aggressive therapy. The goal BP in uncomplicated hypertension is < 140/90, or < 135/85 on home BP monitoring or mean daytime 24-hour ambulatory BP monitoring (ABPM).

In my practice, I advise almost all my hypertensive or "high-normal" BP patients to record their BP at home on a daily basis. I find 24-hour ABPM to be particularly useful in patients with suspected WCH, in whom the result is quite likely to influence medical therapy, either for up-titration of medications or lifestyle changes or for avoidance of additional unnecessary medications.

Resources
1. White WB: Ambulatory Blood-Pressure Monitoring in Clinical Practice. N Engl J Med 2003; 348(24):2377-8.
2. American Diabetes Association: http://care.diabetesjournals.org/content/31/12/2233.full. Accessed: July 31, 2009.

Answered by:
Dr. Brett Heilbron

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