



Patient with coronary artery disease and hypertension

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Abstract

Background: Cardiovascular mortality is and will be number one cause of death in years to come. Many risk factors such as hypertension, diabetes mellitus, dyslipidemias and obesity are related with increase risk of cardiovascular diseases.

Case Report: We present the case of a patient with a significant medical history of hypertension, dyslipidemia, type 2 diabetes, obesity who presented to the emergency department with atypical chest pain. Patient had uncontrolled blood pressure and high level of cholesterol. He was smoker, obese and physically inactive. He underwent a cardiac catheterization that showed a stenosis on right coronary artery originating near the anterior left coronary artery sinus and coursing between. The patient was discharged home on medical management with beta blocker therapy, ACEi, statin and antidiabetic therapy, and was instructed to restrict his physical activity and reduce body weight.

Conclusion: Treatment of patients with coronary artery disease is demanding control of the blood pressure, cholesterol and blood glucose. Many Guidelines try to find optimal treatment and goals in treatment in case to improve quality of life and complications. Any way symptomatic patients with coronary artery disease have 3 treatment options: medical management, coronary angioplasty and stent deployment, or surgical correction.

Kew words arterial hypertension, coronary heart disease, treatment

Introduction

Most variations of cardiovascular diseases are still number one cause of dead in a modern world. Investigators estimate that in a near future we will have slowly decrease but still leading cause and highest mortality will be related to cardiovascular disease.

However, hypertension is on the top of list of separate diseases with very high mortality anywhere in the world. Many epidemiological studies demonstrated that other factors such as diabetes mellitus, dyslipidemias, obesity and unhealthy way of leaving increase in a past decade.

Case report

A 65-year-old male with a significant medical history of hypertension, hyperlipidemia, type 2 diabetes, obesity, presented to the emergency department with atypical cardiac chest pain. He complained of intermittent chest discomfort that had persisted for 2 months. He described the pain as 5 of 10 in severity, substernal, lasting less than 1 minute, nonradiating, resolving spontaneously but becoming acutely worse overnight with minimal exertion. He had never taken sublingual nitroglycerin to relieve his pain, and his electrocardiogram (ECG) on presentation showed normal sinus rhythm with ST and T wave abnormalities potentially indicating

anterior and inferior ischemia seen in III, aVF, and V1-V3 (Figure 1). His 2D echocardiogram 2 months prior to admission had shown a normal ejection fraction (55%) with reduce diastolic function grade II. A bedside echocardiogram showed normal ejection fraction with severe left ventricular hypertrophy.

He was taking medicaments for blood pressure, diabetes and dyslipidemia but on his examination he had elevated blood pressure 155/95 mmHg, with heart rate 65 per minute. Blood glucose was 118 mg/dl, cholesterol 151 mg/dl, HbA1C 6,7%, LDL 68 mg/dl, triglycerides 101 mg/dl, urea 39 mg/dl and creatinine 1,0 mg/dl.

He was admitted to cardiology for unstable angina and underwent a cardiac catheterization that showed an anomaly of RCA. Patient then received medical therapy and was discharged home on a stable condition.

Discussion

Epidemiological studies have established a strong association between hypertension and coronary artery disease (CAD). Hypertension is a major independent risk factor for the development of CAD, stroke, and renal failure. The optimal choice of antihypertensive agents remains controversial, and there are only partial answers to important questions in the treatment of hypertension for the prevention and management of ischemic heart disease (IHD).

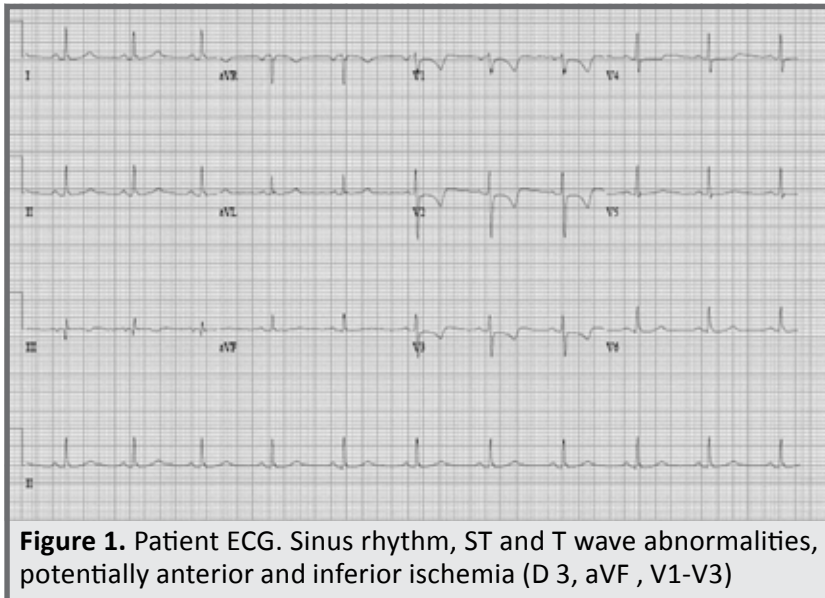


Figure 1. Patient ECG. Sinus rhythm, ST and T wave abnormalities, potentially anterior and inferior ischemia (D 3, aVF , V1-V3)

The prevalence of hypertension is thus directly proportional to the age of the population, with more than half of people >65 years of age having a high BP. The Framingham Heart Study has estimated the remaining lifetime risk of developing hypertension at $\approx 90\%$ for men and women not yet hypertensive by middle age.¹ In addition; there is a change with age in the relative importance of SBP and DBP as risk indicators. Before 50 years of age, DBP is the major predictor of IHD risk, whereas after 60 years of age, SBP is more important.⁵ It is important to note that, in this population ≥ 60 years of age, DBP becomes inversely related to CAD risk and pulse pressure becomes the strongest predictor for CAD.

Randomized trials have shown that BP lowering in patients with hypertension produces rapid reductions in cardiovascular risk that are highly consistent with data from observational studies^{2,3}. For example, a 10-mm Hg lower usual SBP is associated with a 50% to 60% lower risk of stroke death and a $\approx 40\%$ to 50% lower risk of death resulting from CAD.

Several studies (Heart Outcomes Prevention Evaluation [HOPE], Survival and Ventricular Enlargement [SAVE], and European Trial on Reduction of Cardiac Events With Perindopril in Stable Coronary Artery Disease [EUROPA]) have shown a beneficial effect of angiotensin-converting enzyme (ACE) inhibitors on CVD outcomes in individuals.^{4,5,6}

In the Action to Control Cardiovascular Risk in Diabetes (ACCORD) trial, with a mean follow-up of 4.7 years, a target BP of <120 compared with <140 mm Hg was not associated with a reduced risk of a composite of CVD events (heart attack, a stroke, or a cardiovascular death).^{7,8}

Meta-analyses of antihypertensive trials have demonstrated that BP lowering is more important than the particular drug class used in the primary prevention of the complications of hypertension.⁹ Combination antihypertensive drug therapy is typically needed to achieve and to sustain effective long-term BP control.¹⁰

The overall goal of therapy is to reduce excess morbidity and unnecessary deaths. In the case of hypertension, dyslipidemia, and diabetes mellitus have been established therapeutic targets. A commonly cited target for

BP is <140/90 mm Hg in general and <130/80 mm Hg in some individuals with diabetes mellitus or CKD. The first AHA scientific statement from 2015 on the treatment of hypertension in the prevention and management of IHD also recommended a goal of <130/80 mm Hg in individuals with established CAD, with CAD equivalents, or with a Framingham Risk Score of $\geq 10\%$.^{11,12,13}

New AHA guidelines, published in November 2017, suggest blood pressure <130/80 mmHg as a target values in control of blood pressure in patients with CAD. To achieve these targets in adults with DM and hypertension, as useful and effective group of drugs are recommended beta blockers, diuretics, ACE inhibitors, ARBs, and CCBs.¹⁴

Except hypertension, it should be emphasize effect of dyslipidemia, diabetes mellitus, cigarette smoking, obesity, and chronic kidney disease (CKD) as independent determinants of CVD risk. As indicated previously, hypertension represents an independent risk factor for CVD, and evidence indicates that the concomitant presence of other recognized cardiovascular risk factors results in a multiplicative increase in risk for cardiovascular events. Some current guidelines call for more aggressive BP management in the presence of other cardiovascular risk factors, and BP reduction without attention to other risk factors is inadequate to reduce cardiovascular risk.¹⁵

It should to emphasize that there is general consensus that smoking increases the risk of cardiovascular events. Many studies have shown a correlation between smoking and death. Life expectancy is reduced by 13.2 years in male smokers compared with nonsmokers, and this trend is stronger in female smokers, with a 14.5-year decrease in life expectancy.¹⁵

The prevalence of obesity, defined as a body mass index ≥ 30 kg/m², has increased in recent years, with $\approx 30\%$ of the adult falling into this category. The positive relationship between obesity and BP is well documented. Obese adults are ≈ 3 times more likely to be hypertensive compared with non obese adults, and increased adiposity may explain >60% of hypertension in adults.¹⁵

The management of dyslipidemia was the subject of a recent ACC/AHA guideline.

The guideline advocates the use of a 10-year risk calculator determine the appropriate intensity of statin therapy to reduce CVD risk in those most likely to benefit. Those patients with CVD and age ≤ 75 years, with LDL cholesterol ≥ 190 mg/dL, or with a 10-year CVD risk $\geq 7.5\%$ should receive high intensity statin therapy (eg, atorvastatin 40–80 mg/d or rosuvastatin 20–40 mg/d to reduce LDL cholesterol by approximately $\geq 50\%$). Those with CVD who are >75 years of age or those with diabetes mellitus but with a 10-year risk of $<7.5\%$ should receive moderate-intensity statin therapy such as simvastatin 20 to 40 mg/d, atorvastatin 10 to 20 mg/d, or rosuvastatin 5 to 10 mg/d to decrease LDL cholesterol by 30% to 50%.^{16,17}

Patients with type 2 diabetes mellitus is defined as a fasting plasma glucose ≥ 126 mg/dL, a 2-hour oral glucose tolerance test value ≥ 200 mg/dL, hemoglobin A1C $\geq 6.5\%$, or random plasma glucose ≥ 200 mg/dL in a patient with classic symptoms of hyperglycemia. Type 2 diabetes mellitus is a strong and independent risk factor for coronary heart disease. So strong is this association that a diagnosis of diabetes mellitus could be considered a coronary heart disease risk equivalent, although this is controversial. Hypertensive patients with type 2 diabetes mellitus are also at increased risk for diabetes mellitus-specific complications, including retinopathy and nephropathy

Conclusion

This case illustrates an example of an patient with history of hypertension and coronary diseases in a elderly patient presenting with chest pain. The preferred treatment for these patients is conservative medical therapy with good control of blood pressure and other factors.

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Sažetak

Pacijent sa koronarnom bolešću i hipertenzijom

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Smrtnost od kardiovaskularnih oboljenja, kao masovna nezarazna oboljenja, biće i u narednim godinama vodeći uzrok smrti. Mnogi faktori rizika kao što su hipertenzija, dijabetes melitus, dislipidemije i gojaznost povećavaju rizik za kardiovaskularnu smrtnost

Prikaz slučaja: Pacijent sa dugogodišnjom istorijom hipertenzije, i povećanim masnoćama u krvi, tip 2 dijabetesom, gojazan javlja se na pregled sa atipičnim bolom u grudima. Pacijent ima nekontrolisan krvni pritisak i visoke vrednosti holesterola u krvi, pušač, gojazan i fizički neaktivan. Podvrgnut je kateterizaciji koronarnih arterija koja je pokazala stenozu desne koronarne arterije blizu račve sa levom koronarnom arterijom. Pacijent je nakon detaljnih analiza i pregleda otpušten na kućno lečenje uz medikamentoznu terapiju beta blokator, ACI inhibitor, statin i terapija za regulaciju šećera u krvi. Savetovana mu promena načina života i primena nefarmakoloških mera.

Zaključak: Lečenje pacijenata sa koronarnom arterijskom bolešću zahteva adekvatnu kontrolu krvnog pritiska, holesterola i šećera u krvi. Mnogi vodiči relevantnih Udruženja pokušavaju u proteklm godinama da na osnovu rezultata kliničkih studija i dostupnih dokaza, preporuče optimalne ciljeve u lečenju, a sa ciljem da poprave kvalitet života i spreče komplikacije. U svakom slučaju, pacijenti sa koronarnom bolešću imaju tri opcije u lečenju: medikamentozna terapija, koronarna angioplastika i ugradnja stenta ili hirurška korekcija (by pass).

Ključne reči: arterijska hipertenzija, koronarna bolest, tretman