Kidney-heart Connection

Healthy kidneys are important for cardiovascular health. Two most common cause of chronic kidney disease are hypertension and diabetes, and these are also the leading risk factor for heart disease. The cause and the treatment approaches for kidney disease and heart disease, often overlap.

It is known that most people with chronic kidney disease will die of heart disease before they develop kidney failure and require dialysis. Most people don't develop any symptoms until the kidney starts to fail and this often takes several years and at this point kidney function drops below 15%.

This results in accumulation of waste products and fluid in the body, which would cause loss of energy, trouble concentrating, decreased appetite, swelling of the feet and ankles and more frequent urination specially at night

A Vicious cycle Kidneys play an important role in regulating blood pressure by controlling fluid and sodium level in the blood. When the blood pressure rises, kidneys will help to remove water and sodium from the bloodstream into the urine for excretion. This will bring the blood pressure lower, by stimulating the fluid loss through urination.

On the other hand, when the blood pressure falls, the kidneys retain water and sodium to conserve blood volume and raise the blood pressure Patients with high blood pressure tend to retain too much water and sodium. This leads to added stress on the circulation within the kidneys and can cause weakening of the blood vessels inside the kidneys.

This can become a vicious cycle because kidney disease can cause high blood pressure in itself and uncontrolled high blood pressure is the cause of progressive kidney failure. Likewise, prolonged exposure to high blood sugar as occurs in diabetes causes the membrane of the tiny blood vessels known as capillaries to thicken.

This damages the capillaries within the kidneys and reduces their filtering capacity.

Detecting kidney disease: #1. Serum creatinine- Creatinine is released from the muscle cells into the bloodstream and it is one of the substances, the kidneys filter from the blood. If the kidney function declines, blood creatinine level rises. Levels greater than 1.2 mg/dL in women or 1.4 mg/dL in men may suggest early kidney disease. 2.

Glomerular Filtration rate , otherwise called GFR- this test uses the serum creatinine level along with your age and gender to estimate how well your kidneys are working. Value below 60 is a sign that the kidneys are not working properly. 3. Urine protein test- protein in the urine is an early sign of kidney disease.

A sensitive test is the urine albumin to creatinine ratio (UACR) and this can detect very small amount of the protein, called albumin, a condition known as microalbuminuria. A UACR above 30 MG/ gram may suggest kidney disease.

Who should be tested- People with cardiovascular disease, diabetes, and high blood pressure are higher risk for chronic kidney disease and should be checked at least once a year. Obesity, chronic viral infections such as HIV and hepatitis C, autoimmune disease, such as lupus, and also cancer should also be tested.

Certain medications which include all nonsteroidal anti-inflammatory agents such as Ibuprofen and Naproxen (Advil, Aleve)can damage the kidneys.

Slowing Kidney Disease- -Heart healthy lifestyle, especially low sodium diet. -If you have diabetes and hyper tension using blood pressure drugs known as ACE Inhibitors and ARBs help to slow the progression of kidney disease -New class of medications originally designed to treat diabetes called SGLT2 inhibitors, help to prevent kidney damage, even in people who do not have diabetes.

They include Canagliflozin(Invokana),Dapagliflozin(Farxiga), Empagliflozin(Jardiance) - Another medication called Fineranone (Kerendia) also helps to slow the progression of diabetic kidney disease, and also prevents heart related complications. -Avoid taking nonsteroidal, anti-inflammatory agents like Motrin and Advil long-term, without doctors supervision, since they can cause kidney disease

HEART TALK #number 19 CALCULATING YOUR CARDIOVASCULAR RISK

Cardiovascular disease is the leading cause of death in the world. One of the secrets to long and healthy life is to prevent the consequences of atherosclerotic cardiovascular disease. The best place to start is by learning your cardiovascular risk so that you can take necessary steps to lower it If you don't know your risk, you won't have the opportunity to prevent it.

Your individual risk of suffering a serious consequences of atherosclerotic cardiovascular disease can be determined using a formula, design to calculate the percentage of risk, over 10 year period or life time. The lower the percentage,lower the chance and higher the percentage, the higher the chance you will suffer significant heart and vascularproblem.

Several different scoring systems are available. They share several common risk factors but differ from each other depending on the studies on which they were based.

STANDARD U.S. CALCULATOR- The most widely used calculator in the U.S.is the Pooled cohort risk calculator which estimates the 10 year risk of first atherosclerotic cardiovascular event.

Input your age, gender, race, blood pressure, total cholesterol, and high density cholesterol, and answer yes or no to a few questions- whether you have diabetes, whether you were a smoker or Are being treated for hypertension. The calculator then calculates your risk as follows. -Low risk: less than 5% -borderline risk: 5%-7.4% -intermediate risk: 7.5% to 19.9% -high risk: more than 20%.

Generally speaking, those with risk of 7.5% or higher are candidates for Statin therapy. In spite of its popularity, this calculator is controversial because it omits 2 risk factors, namely family history, and the presence of inflammation. Family history is a very powerful risk factor. Physicians can modify the calculator to include it.

Inflammation measured by a blood test for high sensitivity C reactive, protein. (hs CRP) is a proven predictor of risk. Without including these factors, the calculation may not be accurate.

THE REYNOLDS RISK SCORE Whether or not either parent had a heart attack before the age of 60-and inflammation measured by hsCRP are included in this risk score calculator. Therefore, this scoring system may provide a more accurate determination of cardiovascular risk in adults who do not have diabetes. People with diabetes are already at elevated risk of heart attack, and stroke anyway.

THE EUROPEAN SYSTEM- U.S Pooled Cohort risk calculator ignores, geographical differences. European risk calculator do not. The SCORE2 and SCORE2-OP calculators take into consideration, atherosclerotic cardiovascular disease risk in the country, where an individual resides

ADDITIONAL CONSIDERATION- Risk calculators use the most common risk factors for cardiovascular disease, however, there are many other risk factors which can raise an individual risk. Examples include elevated Lipo protein (a), high calcium score and diseases that increase systemic inflammation such as rheumatoid arthritis or lupus.

Other factors are associated with pregnancy and female hormone changes. These include history of preeclampsia, gestational, diabetes, development of hypertension during pregnancy and menopause prior to age 40.

NEXT STEP- When once you know your risk, you need to act upon it. . This is best accomplished by having an honest discussion with your physician. Risk calculators generally provide 10 year risk estimates, but it's a good idea to lower the lifetime risk. This is because your cardiovascular risk will change as you age.

For example, a 50 year old man with mildly elevated LDL may have a low 10 year risk of cardiovascular disease, but his lifetime risk may be higher.

A heart attack can change your life. A stroke can make you disabled. Your goal should be to prevent such adverse events.

Where to find these risk calculators -Pooled cohort calculator Risk Calculator:clinicalc.com/Cardiology/ASCVD/PooledCohort.aspx -REYNOLDS Risk Score:www.reynoldsriskscore.org/default.aspx -SCORE2 and SCORE2-OP: www.es-cardio.org/Education/Practice-Tools/CVD-prevention-toolbox/SCORE-Risk-Charts

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