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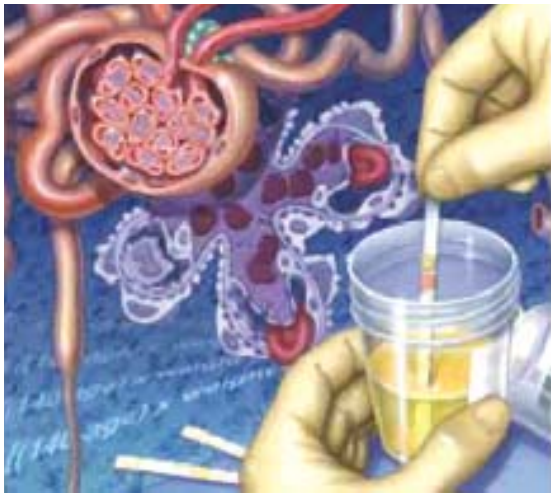
INFO MEDICUS

The essence of medical practice

Detection and evaluation of **chronic kidney disease**



contents

editorial

Dear Doctor

Chronic kidney disease is a common disorder that is associated with raised risk of cardiovascular disease, kidney failure, and other complications. The ageing of populations along with the growing global prevalence of diabetes and other chronic non-communicable diseases has led to corresponding worldwide increases in prevalence of chronic kidney disease and kidney failure. Strategies for early identification and treatment of people with chronic kidney disease, who are at risk of cardiovascular events and progression to the end stage of chronic kidney disease (kidney failure), are needed worldwide, especially in countries where renal replacement is not readily available. On view of this concept we have selected "Detection and evaluation of chronic kidney disease" as the topic of review article. This article focuses on the detection of chronic kidney disease and the initial evaluation of affected patients.

In case review, we discussed a strange case of waitress headache due to Listeria rhomboencephalitis. Listeria rhomboencephalitis is a food-borne infection, which represents a diagnostic and therapeutic challenge owing to its rarity and non-representative manifestations. The incidence of Listeria rhomboencephalitis is increasing day by day probably due to the widespread use of immunosuppressive medications, consumption of fast food, and food production methods (longer shelf-life foods). Foods most commonly implicated are soft cheeses, raw or ready-to-eat meat, and pre-processed foods.

Besides these, regular sections are presented as usual. Our effort has been made to make this issue interesting to you and we are quite sure that you will enjoy this as well.

We need your suggestions to make our efforts worthwhile and looking for your comments to make this journey a useful one.

Thanks and best regards
ACI Pharmaceuticals

(Dr. S. M. Saidur Rahman)
Medical Services Manager

(Dr. Rumana Dowla)
Manager, Medical Information & Research

Detection and evaluation of chronic kidney disease

Introduction

Chronic kidney disease (CKD) is a common disorder and its prevalence is increasing worldwide. Early diagnosis on the basis of presence of proteinuria or reduced estimated glomerular filtration rate could permit early intervention to reduce the risks of cardiovascular events, kidney failure, and death that are associated with chronic kidney disease. In developed countries, screening for the disorder is most efficient when targeted at high-risk groups including elderly people and those with concomitant illness (such as diabetes, hypertension, or cardiovascular disease) or a family history of chronic kidney disease, although the role of screening in developing countries is not yet clear.

Effective strategies are available to slow the progression of chronic kidney disease and reduce cardiovascular risk. Treatment of high blood pressure is recommended for all individuals with, or at risk of, chronic kidney disease. Use of angiotensin-converting-enzyme inhibitors or angiotensin-receptor blockers is preferred for patients with diabetic chronic kidney disease or those with the proteinuric non-diabetic disorder. Glycaemic control can help prevent the onset of early stages of chronic kidney disease in individuals with diabetes. Use of statins and aspirin is beneficial for most patients with chronic kidney disease who are at high cardiovascular risk, although research is needed to ascertain how to best prevent cardiovascular disease in this cohort.

Models of care that facilitate delivery of the many complex aspects of treatment simultaneously could enhance management, although effects on clinical outcomes need further assessment. Novel clinical methods to better identify patients at risk of progression to later stages of chronic kidney disease, including kidney failure, are needed to target management to high-risk subgroups.

Classification and selected examples of causes of chronic kidney disease

Chronic kidney disease

Glomerular filtration rate <60 mL per min per 1.73 m^2 for >3 months or evidence of kidney damage on urinalysis, kidney imaging, or biopsy

Diabetic chronic kidney disease

Diabetic nephropathy (type 1 or Vascular 2 diabetes mellitus)

Non-diabetic chronic kidney disease

Vascular

With or without haematuria or proteinuria

- Large-vessel disease (renal artery stenosis)
- Small-vessel disease (hypertension, vasculitis, microangiopathy)

Glomerular

Haematuria or albuminuria

- Primary nephritis (IgA nephropathy)
- Autoimmune disorders (connective tissue disease)
- Systemic infection (bacteria, virus, parasite)
- Malignant disease (solid organ, haematological)
- Drugs
- Hyperfiltration (reduced renal mass, obesity)

Tubulointerstitial

With or without mild proteinuria or pyuria

- Autoimmune disorders (connective tissue disease, granulomatous disease)
- Drug toxic effects (analgesics, metals)
- Chronic infection (bacteria, virus & parasite)
- Obstructive nephropathy (chronic urinary-tract obstruction)
- Post-acute kidney injury (ischaemic/toxic injury)

Cystic

Evident on renal imaging

- Polycystic kidney disease (autosomal dominant polycystic kidney disease)

Definition

Chronic kidney disease (CKD) is defined by a sustained reduction in glomerular filtration rate or evidence of structural or functional abnormalities of the kidneys on urinalysis, biopsy, or imaging.

NKF definition of CKD

- Kidney damage for three or more months, as defined by structural or functional abnormalities of the kidney, with or without decreased GFR, manifested by pathologic abnormalities or markers of kidney damage, including abnormalities in the composition of the blood or urine or abnormalities in imaging tests
- GFR <60 mL per minute per 1.73 m^2 for three months or more, with or without kidney damage

NKF = National Kidney Foundation
GFR = glomerular filtration rate

Etiology

The most frequent cause of CKD is diabetic nephropathy, most often secondary to type 2 diabetes mellitus. Hypertensive nephropathy is a common cause of CKD in the elderly, in whom chronic renal ischemia as a result of small and large vessel renovascular disease may be under recognized. Progressive nephrosclerosis from vascular disease is the renal correlate of the same processes that lead to coronary heart disease and cerebrovascular disease. The increasing incidence of CKD in the elderly has been ascribed, in part, to decreased mortality from the cardiac and cerebral complications of atherosclerotic vascular disease in these individuals, enabling a greater segment of the population to manifest the renal component of generalized vascular disease. Nevertheless, it should be appreciated that overwhelmingly the vast majority of those with early stages of renal disease, especially of vascular origin, will succumb to the cardiovascular and cerebrovascular consequences of the vascular disease before they can progress to the most advanced stages of CKD. The early stage of CKD, manifesting as albuminuria and even a minor decrement in GFR, is now recognized as a major risk factor for cardiovascular disease.

Risk factors for CKD

Susceptibility factors

- Older age
- Family history of CKD
- Reduction in kidney mass
- Low birth weight

Initiation factors

- Diabetes
- High blood pressure
- Autoimmune disease
- Systemic infections
- Urinary tract infections
- Urinary stones
- Lower urinary tract obstruction
- Drug toxicity

Progression factors

- Higher level of proteinuria
- Higher blood pressure
- Poor glycemic control in diabetes
- Smoking

End-stage factors

- Lower dialysis dose
- Temporary vascular access
- Anemia
- Lower serum albumin level

Stages

A five-stage classification system for the disorder has been established In the clinical setting, glomerular filtration rate is generally estimated on the basis of creatinine concentration in serum and demographic features (age, sex, and ethnic origin) with the severity of chronic kidney disease in the five-stage scheme is based mainly on glomerular filtration rate, although risk of complications at a given rate is modified substantially by the amount of proteinuria.

Stages of CKD

Stage	Description	GFR (mL per min per 1.73 m^2)
0	At increased risk for chronic kidney disease	≥ 60 (with risk factors for chronic kidney disease)
1	Kidney damage with normal or increased GFR	≥ 90
2	Kidney damage with mildly diminished GFR	60 to 89
3*	Moderately reduced GFR	30 to 59
4	Severely decreased GFR	15 to 29
5	End-stage renal disease (kidney failure)	< 15 (or dialysis)

GFR=glomerular filtration rate
*UK National Institute for Health and Clinical Excellence guidelines split stage 3 into two subcategories (3A, GFR 45-59 mL per min per 1.73 m^2; and 3B, GFR 30-44 mL per min per 1.73 m^2) and uses the suffix (p) to denote the presence of proteinuria

Detection of CKD

Patients screen

The Kidney disease outcomes quality initiative (KDOQI) from the National Kidney Foundation (NKF) has developed guidelines for the detection and evaluation of chronic kidney disease. The KDOQI guidelines recommend assessing all patients for kidney-disease risk factors. High-risk groups that should be screened for chronic kidney disease include patients who have a family history of the disease and patients who have diabetes, hypertension, recurrent urinary tract infections, urinary obstruction, or a systemic illness that affects the kidneys.

Method of screen

Screening patients at risk for chronic kidney disease relies on the detection of functional abnormalities using readily available, inexpensive laboratory tests. The measured serum creatinine level is used to calculate an estimated glomerular filtration rate (GFR). Screening for proteinuria often alerts the physician to the presence of chronic kidney disease before changes in the GFR become apparent. Current KDOQI guidelines recommend screening for kidney disease with a serum creatinine measurement for use in GFR estimation and analysis of a random urine sample for albuminuria. Significant kidney disease can present with decreased GFR or proteinuria, or both. Selected patients with risk factors for kidney disease should be screened with renal ultrasonography.

Estimating the GFR

The GFR is an indication of functioning kidney mass; it has implications for treatment goals and for the dosing of renally excreted medications. The KDOQI guidelines define stages of chronic kidney disease based on an estimated GFR that is calculated from the serum creatinine level. The standard for GFR measurement is the clearance rate of inulin, a substance that passes through the kidney unchanged.

Creatinine clearance, as measured by a 24 hour urine collection, usually overestimates the GFR because of the active secretion of creatinine by the kidney and can vary with muscle mass. Significant kidney dysfunction may be present despite a normal serum creatinine level. An estimation of the GFR based on the serum creatinine level correlates better with direct measures of the GFR and detects more cases of chronic kidney disease than does the serum creatinine level alone. Clinically useful GFR estimates are calculated from the measured serum creatinine level12,13 after adjustments for age, sex, and race. A GFR of 100 mL per minute per 1.73 m^2 is considered normal for women, and 120 mL per minute per 1.73 m^2 is a normal GFR for men. In most situations and as long as kidney function is stable, a calculated GFR can replace measurement of a 24-hour urine collection for creatinine clearance.

Calculating the GFR

The MDRD formula (derived from the Modification of Diet in Renal Disease trial) is more accurate than the traditional 24 hour creatinine clearance determination using these, it can be calculate the GFR accurately in seconds if the appropriate laboratory and demographic data (serum creatinine, sex of the patient, racebof the patient, blood urea nitrogen, and serum albumin) are available.

The 24 hour creatinine clearance, based on a 24 hour urine sample, may be less accurate than the MDRD formula but more accurate than the Cockroft-Gault formula. The disadvantages of this method include the added expense and the potential for errors in urine collection.

The Cockroft-Gault formula, although somewhat less accurate, is more familiar than the MDRD formula and can be quickly used during an office visit using a simple calculator; this estimated creatinine clearance is a good approximation of the GFR. The Cockroft-Gault formula is less accurate for patients over age 65 or at the extremes of body weight.

Three formulas for calculating the GFR

MDRD formula (most accurate)

$$GFR = 170 \times \text{serum creatinine concentration}^{-0.999} \times \text{age}^{-0.176} \times 0.762 \text{ (if female)} \times 1.18 \text{ (if race is black)} \times \text{blood urea nitrogen concentration}^{-0.17} \times \text{serum albumin concentration}^{-0.318}$$

24-hour creatinine clearance

(intermediate accuracy, least convenient)

$$GFR = \frac{\text{urine creatinine concentration} \times \text{volume in mL}}{\text{serum creatinine concentration} \times \text{time in minutes}}$$

Cockroft-Gault formula (least accurate, most convenient)

$$GFR = \frac{(140 - \text{age}) \times \text{weight in kg} \times (0.85 \text{ if female})}{72 \times \text{serum creatinine concentration}}$$

Detecting and quantitating proteinuria

Proteinuria is associated with more rapid progression of chronic kidney disease and a greater likelihood of developing end-stage renal disease. Consequently, detection and quantitation of proteinuria are essential to the diagnosis and treatment of chronic kidney disease. Quantitative measures of proteinuria also are used to monitor response to therapy. Albumin, the predominant protein excreted by the kidney in most types of renal disease, is detected readily by urine dipstick testing. In some conditions, immunoglobulins also may be excreted in urine. The protein-creatinine ratio in an early-morning random urine sample correlates well with 24-hour urine protein excretion and is much easier to obtain. Microalbuminuria often heralds the onset of diabetic nephropathy. The KDOQI guidelines and the American Diabetes Association (ADA) guidelines recommend screening for microalbuminuria in all patients at risk for kidney disease. Screening can be performed using a microalbumin-sensitive dipstick or analysis of a random morning urine sample to determine the microalbumin-creatinine ratio. Microalbumin dipsticks have a sensitivity of 51 to 100 percent and a specificity of 27 to 97 percent.

Evaluation of patient with CKD

Once chronic kidney disease has been identified, goals include determining the stage of the disease, establishing the cause of the disease, and evaluating comorbid conditions. All patients with chronic kidney disease should undergo urinalysis and renal imaging as part of the diagnostic evaluation. Patients with long-standing diabetes, hypertension, and a clinical course consistent with chronic kidney disease secondary to these conditions may not require further evaluation. The evaluation of all patients is guided by the symptoms (e.g., rash, arthritis, or urinary symptoms); family history of kidney disorders (e.g., cystic kidney diseases); and known medical problems. Underlying diseases may be identified by the physical examination, with special attention given to the skin, joints, and cardiovascular system.

History

In taking the history of a patient with CKD, at first the clinician should attempt to determine when the onset of proteinuria and hypertension occurred and whether previous serum creatinine tests have been performed. Patients should also be questioned regarding voiding symptoms, such as hesitancy, decreased stream strength, or intermittent large and small voiding amounts, because these symptoms suggest obstructive uropathy. Every patient with an elevated serum creatinine level should be asked if they have a history of diabetes, arthritis, or medication exposure. Almost all NSAIDs, including over-the-counter forms and almost all antibiotics, have been reported to cause renal failure. In fact, no NSAID can be declared "safe" with regard to renal failure. Previous use of chemotherapeutic agents, such as gemcitabine and cisplatin, or history of gastroesophageal reflux disease and proton pump inhibitor use should be identified. Recent radiographic studies using radiocontrast agents should also be considered when attempting to identify possible causes of an elevated serum creatinine level.

Diagnostic examination

The diagnostic examination for the patient with renal failure includes a few unique items. First, to test for prerenal azotemia, lying and standing blood pressure and pulse should be recorded. Funduscopic examination for findings of hypertension and diabetic changes should be performed. The ability to view the nondilated fundus is greatly enhanced with the use of a specially designed ophthalmoscope. During an examination specific to a diagnosis of

Assess kidney function and damage

Test	Assessment
Estimated Glomerular Filtration Rate (eGFR)	■ Evaluate eGFR to assess kidney function; track over time to monitor effectiveness of diet therapy ■ Stable eGFR may indicate therapy is working ■ Decline of eGFR reflects progression of CKD
Urine Albumin-to-Creatinine Ratio (UACR)	■ Evaluate UACR over time to assess response to therapy and monitor progression of CKD ■ Change in albuminuria may reflect response to therapy and risk for progression ■ A decrease in urine albumin may be associated with improved renal and cardiovascular outcomes

increasing serum creatinine levels, the clinician should also check for evidence of volume overload (rales, third heart sound, and lower-extremity edema), joint effusions or erythema, and splinter hemorrhages, as well as palpate for distended bladder above the symphysis pubis.

Laboratory investigation

Serum and urine protein electrophoresis should be obtained in all patients >35 years with unexplained CKD, especially if there is associated anemia and elevated, or even inappropriately normal, serum calcium concentration in the face of renal insufficiency. In the presence of glomerulonephritis, underlying infectious etiologies such as hepatitis B and C and HIV should be assessed. Serum concentrations of calcium, phosphorus, and PTH should be measured to evaluate metabolic bone disease. Hemoglobin concentration, iron, B12, and folate should also be evaluated. A 24-hour urine collection may be helpful, as protein excretion > 300 mg may be an indication for therapy with ACE inhibitors.

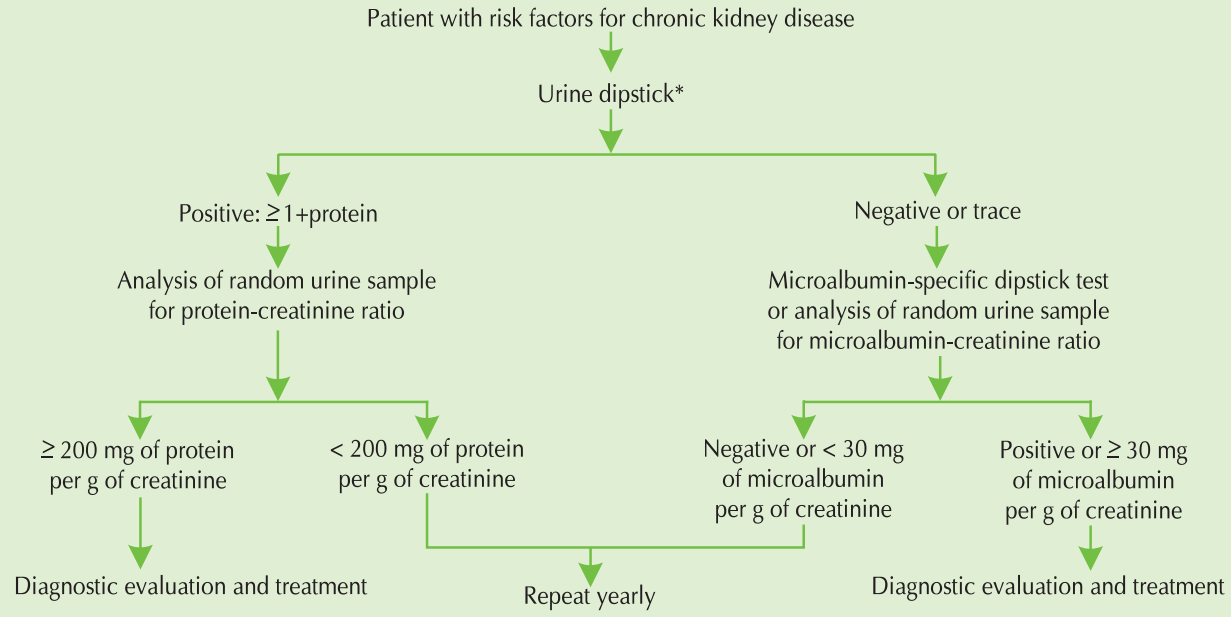
Imaging studies

The most useful imaging study is a renal ultrasound, which can verify the presence of two kidneys, determine if they are symmetric, provide an estimate of kidney size, and rule out renal masses and evidence of obstruction. Renal ultrasonography helps establish the diagnosis and prognosis by documenting the size of the kidneys. Normal size indicates kidney disease that may be amenable to medical treatment. Small kidneys suggest irreversible disease. Asymmetry in kidney size suggests renovascular disease.

Renal biopsy

Renal biopsy is indicated when the cause cannot be determined by the history and laboratory evaluation, when the patient's signs and symptoms suggest parenchymal disease, and when the differential diagnosis includes diseases that require different treatments or that have different prognoses. Biopsy more commonly is required in patients with chronic kidney disease that is not related to diabetes, and biopsy often is indicated in adult patients with nephritic syndrome or suspected glomerulonephritis. Based on an international survey of nephrologists, rates of biopsy vary widely in practice.

Evaluation for proteinuria and microalbuminuria



* If available, an albumin-specific dipstick may be used in place of a standard urine dipstick as the initial step in screening

Treatment

Patients with chronic kidney disease should be evaluated to determine the following: specific diagnosis (type of kidney disease), comorbid conditions, disease severity (assessed by the level of kidney function), complications (related to the level of kidney function), risk for loss of kidney function, and risk for development of cardiovascular disease. The optimal timing of therapy is usually well before there has been a measurable decline in GFR and certainly before CKD is established. It is helpful to sequentially measure and plot the rate of decline of GFR in all patients. Any acceleration in the rate of decline should prompt a search for

superimposed acute or subacute processes that may be reversible. The following interventions should be considered in an effort to stabilize or slow the decline of renal function.

Treatment

- Therapy based on the specific diagnosis
- Evaluation, and management of comorbid conditions
- Measures to slow loss of kidney function
- Measures to prevent and treat cardiovascular disease
- Measures to prevent and treat complications of decreased kidney function
- Preparation for kidney failure and kidney replacement therapy
- Replacement of kidney functions by dialysis or transplantation if signs and symptoms of uremia are present

Most drugs is not affected by CKD because no renal elimination is used in the calculation, the maintenance doses of many drugs will need to be adjusted. For those agents in which >70% excretion is by a nonrenal route, such as hepatic elimination, dose adjustment may not be needed. Some drugs that should be avoided include metformin, meperidine, and oral hypoglycemics that are eliminated by the kidney. NSAIDs should be avoided because of the risk of further worsening of kidney function. Many antibiotics, antihypertensives, and antiarrhythmics may require a reduction in dosage or change in the dose interval.

Protein restriction

Protein restriction may be effective in slowing the progression of CKD, especially proteinuric and diabetic renal diseases. Restriction of dietary protein intake has been recommended for CKD patients. KDOQI clinical practice guidelines include a daily protein intake of between 0.60 and 0.75g/kg per day, depending upon patient adherence, comorbid disease, presence of proteinuria, and nutritional status. It is further advised that at least 50% of the protein intake be of high biologic value. As patients approach stage 5 CKD, spontaneous protein intake tends to decrease, and patients may enter a state of protein-energy malnutrition. In these circumstances, a protein intake of up to 0.90g/kg per day might be recommended, again, with an emphasis on proteins of high biologic value.

Reducing intra glomerular hypertension and proteinuria

Increased intraglomerular filtration pressures and glomerular hypertrophy develop as a response to loss of nephron number from different kidney diseases. Control of systemic and glomerular hypertension is at least as important as dietary protein restriction in slowing the progression of CKD. Therefore, in addition to reduction of cardiovascular disease risk, antihypertensive therapy in patients with CKD also aims to slow the progression of nephron injury by reducing intraglomerular hypertension. The renoprotective effect of antihypertensive medications is gauged through the consequent reduction of proteinuria. Thus, the more effective a given treatment is in lowering protein excretion, the greater the subsequent impact on protection from decline in GFR. ACE inhibitors and ARBs inhibit the angiotensin-induced vasoconstriction of the efferent arterioles of the glomerular microcirculation. This inhibition leads to a reduction in both intraglomerular filtration pressure and proteinuria. These drugs are effective in slowing the progression of renal failure in patients with both diabetic and nondiabetic renal failure. This slowing in progression of CKD is strongly associated with their proteinuria-lowering effect.

Control of blood glucose

Excellent glycemic control reduces the risk of kidney disease and its progression in both type 1 and type 2 diabetes mellitus. It is recommended that plasma values for preprandial glucose be kept in the 5.0-7.2 mmol/L (90-130 mg/dL) range and hemoglobin A_{1C} should be <7%. As the GFR decreases with progressive nephropathy, the use and dose of oral hypoglycemics needs to be reevaluated. For example, chlorpropamide may be associated with prolonged hypoglycemia in patients with decreased renal function; metformin has been reported to cause lactic acidosis in the patient with renal impairment and should be discontinued when the GFR is reduced; and the thiazolidinediones (e.g., rosiglitazone, pioglitazone, and others), may increase renal salt and water absorption and aggravate volume-overloaded states. Finally, as renal function declines, renal degradation of administered insulin will also decline, so that less insulin may be required for glycemic control.

Management of patients with early stages of CKD	
Lifestyle changes	
Smoking	Recommend smoking cessation
Diet	Sodium intake <100 mmol (2.3 g) per day Consider oral sodium bicarbonate supplementation if acidotic
Weight	Body-mass index <25 kg/m^2; waist circumference <102 cm for men and <88 cm for women
Exercise	When feasible, 30-60 min of moderate intensity dynamic exercise (walking, jogging, cycling, or swimming) 4-7 days per week
Hypertension	
Treatment goal	<125-130/75-80 mm Hg
Pharmacotherapy	Proteinuric chronic kidney disease (urine albumin-to-creatinine ratio ≥ 30 mg/mmol or random urine protein equivalent to ≥500 mg per day) should include an ACE inhibitor or an angiotensin-receptor blocker Non-proteinuric chronic kidney disease might use either an ACE inhibitor, an angiotensin-receptor blocker, a thiazide diuretic, a β blocker (in patients <60 years, or with existing ischaemic heart disease), or a long-acting calcium-channel blocker
Diabetes mellitus	
Treatment goal	HbA_{1c} <7.0%, fasting plasma glucose 4-7 mmol/L
Pharmacotherapy	Metformin acceptable for stage 1-2 chronic kidney disease, and stable stage 3 chronic Kidney disease Repaglinide acceptable with no dose adjustment Short-acting sulphonylureas (e.g., gliclazide) are preferred over long-acting agents Sulphonylureas and insulin need dose adjustment
Dyslipidaemia	
Treatment goal	LDL-cholesterol targets for patients with stage 3-4 chronic kidney disease should follow guidelines for the general population
Pharmacotherapy	Statins preferred Fibrates need dose adjustments Bile acid sequestrants, statins, niacins, ezetimibe do not need dose adjustments
Antiplatelets	
Pharmacotherapy	Aspirin daily if high risk or established cardiovascular disease and no contraindication

ACE=angiotensin-converting enzyme. HbA_{1c}=glycosylated haemoglobin

Control of blood pressure and proteinuria

Hypertension is found in the majority of type 2 diabetic patients at diagnosis. This finding correlates with the presence of albuminuria and is a strong predictor of cardiovascular events and nephropathy. Testing for microalbumin is recommended in all diabetic patients, at least annually. If the patient already has established proteinuria, then testing for microalbumin is not necessary. Antihypertensive treatment reduces albuminuria and diminishes its progression even in normotensive diabetic patients. In addition to treatment of hypertension in general, the use of ACE inhibitors and ARBs in particular is associated with additional renoprotection.

Preparation for renal replacement therapy

Clear indications for initiation of renal replacement therapy for patients with CKD include pericarditis, encephalopathy, intractable muscle cramping, anorexia, and nausea not attributable to reversible causes such as peptic ulcer disease, evidence of malnutrition, and fluid and electrolyte abnormalities, principally hyperkalemia, that are refractory to other measures.

Preserving renal function in CKD

Regardless of the renal process, patients with renal failure can and should be managed aggressively with a 9-pronged approach. If primary care physicians actively pursue this approach, they can substantially reduce the rate of GFR decline and delay the need for dialysis or renal transplant. Aggressive blood pressure reduction has

always been shown to protect the kidney from further damage. The use of antihypertensive agents with antiproteinuric properties is also important but does not supersede the need to reach goal blood pressure. When blood pressure is well controlled, additional therapy (adding an angiotensin receptor blocker to an angiotensin-converting enzyme inhibitor or increasing doses of either) with resultant reduction in quantitative proteinuria has also been found to benefit patients with CKD and proteinuric renal disease. Good diabetes control can slow the rate of progression of diabetic nephropathy. Reduction in low-density lipoprotein cholesterol to less than 100 mg/dL (to convert to mmol/L, multiply by 0.0259) not only reduces the risk of vascular disease, which is very high in these patients, but also provides some degree of renal protection. Although the low-protein diet has never been shown to be beneficial in reducing the rate of GFR decline in humans, it is often still recommended. The low-protein diet is counterintuitive as a means of slowing the rate of GFR decline: if patients reduce their protein intake, they replace that caloric intake with fat and glucose that accelerate their vascular disease development. Unless they refuse dialysis or transplant, patients do not die of renal failure; however, they do die of acute myocardial infarction or stroke, often before reaching end-stage renal disease, and thus the American Heart Association diet, which is low in fat and salt (for blood pressure control), is preferred. Patients with renal disease may be overwhelmed with the many major modifications in lifestyle that they are asked to make. By focusing their attention on the most important modifications, such as smoking cessation, and deemphasizing lowpriority modifications, such as the low-protein diet, better results may be obtained.

Preservation of kidney function: 9-Pronged approach[a]

1. Control hypertension
   Target blood pressure <130/80 mm Hg or <125/75 mm Hg if more than 1 g/d/1.73 m^2 of proteinuria
2. Control diabetes
3. Control lipid levels
   Target LDL-C <100 mg/dL[b]
4. Use antiproteinuric antihypertensive agents
   Angiotensin-converting enzyme inhibitors
   Angiotensin receptor blockers
   Aldosterone inhibitors
   Diltiazem
5. Avoid NSAIDs
6. Recommend dietary modification
   Suggest low-fat, low-salt American Heart Association diet Restrict calories, if patient has diabetes
7. Avoid radiocontrast radiographic tests and premedicate patient if required
8. Advise patients with renal failure to discuss their condition with any physician who intends to prescribe a new medication so that the physician can avoid certain medications or adjust doses, as appropriate
9. Encourage regular visits to a nephrologist (every 6-12 month)

[a]LDL-C = low-density lipoprotein cholesterol; NSAID = nonsteroidal anti-inflammatory drug
[b]SI conversion factor: To convert LDL-C values to mmol/L, multiply by 0.0259

Conclusion

Identifying the cause of an elevated serum creatinine level can be challenging. The systematic approach should greatly assist clinicians in identifying those causes. Although referral to a nephrologist will sometimes still be necessary, this approach should make the patient and primary care physician better able to understand what issues the nephrologists may need to address to evaluate the elevated serum creatinine level. If the renal failure becomes chronic, the primary care physician can help the patient maintain long-term renal function by encouraging adherence to the 9-pronged treatment approach.

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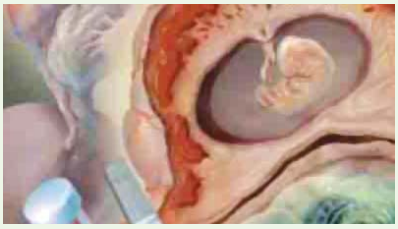
Info Quiz Participants

- Have you selected the correct answer(s) You still have time to put your entry submission together for Info Quiz Prize
- The closing date for entries is 30 December 2011
- We look forward to receiving your winning entry

Info Quiz Answers July-September 2011

1. a	2. e	3. d	4. d	5. b
6. b	7. b	8. b	9. c	10. a

Ectopic pregnancy



An ectopic pregnancy is a condition in which a fertilized egg settles and grows in any location other than the inner lining of the uterus. The vast majority of ectopic pregnancies is so-called tubal pregnancies and occurs in the Fallopian tube (98%); however, they can occur in other locations, such as the ovary, cervix, and abdominal cavity. An ectopic pregnancy occurs in about one in 50 pregnancies. A molar differs from an ectopic in that it is usually a mass of tissue derived from an egg with incomplete genetic information that grows in the uterus in a grape-like mass that can cause symptoms to those of pregnancy.

Risk factors

Risk factors most strongly associated with ectopic pregnancy include previous ectopic pregnancy, tubal surgery, and in utero diethylstilbestrol (DES) exposure. A history of genital infections or infertility and current smoking increase the risk. Contraceptive use reduces the annual risk for intrauterine and ectopic pregnancy; however, previous intrauterine device use may increase risk.

Risk factors

- Previous tubal surgery
- Previous ectopic pregnancy
- In utero diethylstilbestrol exposure
- Previous genital infections
- Infertility
- Current smoking
- Previous intrauterine device use

Symptoms

- Abnormal vaginal bleeding
- Amenorrhea
- Breast tenderness
- Low back pain
- Mild cramping on one side of the pelvis
- Nausea and diarrhea
- Pain in the lower abdomen or pelvic area

If the ectopic pregnancy is rupture then following symptoms are appear:

- Feeling faint or actually fainting
- Severe, sharp and sudden pain in the lower abdomen
- Shoulder tip pain
- Increase pressure in the rectum

Diagnosis

Ectopic pregnancy is most common in women of reproductive age who present with abdominal pain and vaginal bleeding approximately seven weeks after amenorrhea. These findings are nonspecific and are common in patients who may miscarry.

Clinical examination

A normal or slightly enlarged uterus, vaginal bleeding, pelvic pain with manipulation of the cervix, and a palpable adnexal mass significantly increase the likelihood of an ectopic pregnancy. Significant abdominal tenderness suggests ruptured ectopic pregnancy, especially in a patient with hypotension who presents with guarding and rebound tenderness.

Diagnostic tests

Diagnostic tests for ectopic pregnancy include a urine pregnancy test; ultra-sonography; β–hCG measurement; and, occasionally, diagnostic curettage. In the past, some physicians have used serum progesterone levels as well.

Diagnostic tests

- Transvaginal ultrasonography with β-hCG level greater than 1,500 mIU per mL (1,500 IU per L)
- β-hCG levels do not increase appropriately
- Single progesterone level to distinguish ectopic pregnancy from nonectopic pregnancy
- Single progesterone level to distinguish pregnancy failure from viable intrauterine pregnancy

Determining ectopic pregnancy risk

- Peritoneal irritation or cervical motion tenderness
- No fetal heart tones; no tissue at cervical os; pain present
- Fetal heart tones or tissue at cervical os; no pain

Treatment

Treatment options for ectopic pregnancy include observation, laparoscopy, laparotomy, and medication. Selection of these options is individualized. Some ectopic pregnancies will resolve on their own without the need for any intervention, while others will need urgent surgery due to life-threatening bleeding. However, because of the risk of rupture and potential dire consequences, most women with a diagnosed ectopic pregnancy are treated with medications or surgery. Medical treatment of ectopic pregnancies is now more common and avoids the need for surgery. Injection methotrexate is often use as a medical treatment. This drug acts by killing the growing cells of the placenta, thereby inducing miscarriage of the ectopic pregnancy.

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3. PubMed Health
4. Am Fam Physician 2005;72:1707-14, 1719-20
5. Patient.co.uk

A strange case of waitress headache

A 21 year old woman, who worked as a waitress at a restaurant, presented to the neurological department with a sudden-onset, non-specific headache of moderate severity, which was unresponsive to over-the-counter medications. She also had vomiting and unsteadiness. 2 weeks before she had had a self-limited episode of febrile gastroenteritis. On admission, she was afebrile and she had horizontal nystagmus. Blood tests showed slight leuco cytosis. Over the next 24 hour, her neurological status worsened and she developed mild neck stiff ness, bilateral cerebellar ataxia, and right-sided facial hypoaesthesia. After 48 hour, she had dysphagia, dysarthria, and persistent hiccupping. MRI of the brain showed large brainstem and cerebellar lesions with patchy regions of gadolinium enhancement and relevant oedema. Cerebrospinal fluid (CSF) analysis showed: protein concentration 1.38 g/L, glucose concentration 2.26 mmol/L, leucocytes 10/µL (70% poly morphonuclear). Oligoclonal bands were absent and CSF Gram staining negative. Molecular and serological tests for herpes simplex virus, cytomegalovirus, Epstein-Barr virus, entero virus, *Brucella sp, Mycobacterium tuberculosis, Mycoplasma pneumoniae, Tropheryma whipplei, Leptospira sp, Borrelia burgdorferi, Entamoeba histolytica,* and fungal infections were all negative.

Clinical and neuroradiological data, and the inflammatory CSF findings were consistent with infection. Intravenous ceftriaxone (2g daily) and ampicillin (2g every 4 hour) were started. On day 4 of the hospital stay, Listeria monocytogenes (serotype strain 4b) was isolated from blood cultures done on admission. The suspected source of infection was ready-to-eat meat served at the restaurant.

Treatment with intravenous ampicillin was continued for 14 days, together with gentamicin (3 mg/kg every 8 hour) from day 5 of the hospital stay. Dexamethasone (0.15 mg/kg every 6 hour) was added for its alleged anti-endemic effect during the first week. The patient's clinical condition greatly improved within 3 weeks and at discharge she had mildly ataxic gait only. Underlying predisposing conditions (pregnancy, coexisting immunosuppression-including HIV infection, and autoimmune disease) were excluded.

Another 27 year old waitress presented to the neurological department with exactly the same neuroradiological and laboratory findings (L monocytogenes strain 4b, distinguishable pulsotype). However, despite similar treatment, the second patient developed disability. At last follow-up the first patient had only slight residual ataxia. Brain MRI showed a considerable decrease in the extent of lesions with no further evident gadolinium enhancement.

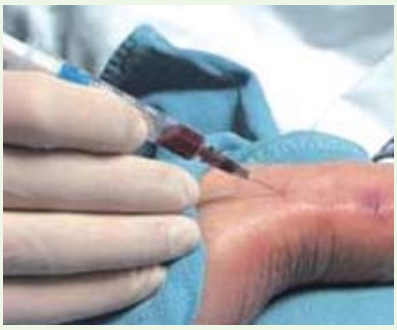
Listeria rhomboencephalitis is a food-borne infection, which represents a diagnostic and therapeutic challenge owing to its rarity and non-representative manifestations. The aetiology of rhomboencephalitis includes infectious, neoplastic (glioma, lymphoma, paraneoplastic syndrome associated with anti-Yo or anti-Tr antibodies) and inflammatory conditions (multiple sclerosis, Behcet's disease, vasculitis, neurosarcoidosis). Blood cultures are essential because CSF Gram staining is negative in 50% of cases.

Brain MRI T2 weighted sequence
Showing brainstem lesions and relevant oedema (arrow)

The incidence of listeria rhombo-encephalitis increased day by day probably due to the widespread use of immunosuppressive medications, consumption of fast food, and food production methods (longer shelf-life foods). Foods most commonly implicated are soft cheeses, raw or ready-to-eat meat, and pre-processed foods. The incubation time is between 11 and 70 days, and infection can present with a sepsis-like syndrome or acute to subacute central nervous system infection, as in our patient. Listeriosis is a life-threatening infection with fatality rates of 24-62%, and can often lead to neurological sequelae. Early suspicion in healthy adults with no predisposing conditions is necessary for prompt treatment.

Reference: Lancet, Nov. 19, 2011, Vol. 378: 1824

Arterial puncture for blood gas analysis



Radial arterial puncture for arterial blood gas analysis is a common procedure performed in adults. Puncture of the radial artery is the preferred method of obtaining an arterial blood sample for blood gas analysis. This information is needed in assessing a patient with acute, severe respiratory distress. Measurements of arterial pH and the partial pressures of carbon dioxide and oxygen provide accurate information on the status of acid-base balance and gas exchange.

Indications

Puncture of the radial artery is the preferred method of obtaining an arterial blood sample for blood gas analysis. The chief indication for blood gas analysis is the need to obtain values for the partial pressures of oxygen and carbon dioxide and for arterial pH. This information is needed in assessing a patient with acute, severe respiratory distress. Measurements of arterial pH and the partial pressures of carbon dioxide and oxygen provide accurate information on the status of acid-base balance and gas exchange. Another indication for arterial blood gas sampling is the need to perform CO-oximetry in order to assess for methemoglobinemia and carboxyhemoglobinemia.

Indications

The chief indication for blood gas analysis is the need to obtain values for the:

- Partial pressures of oxygen
- Carbon dioxide
- Arterial pH

Another indication for arterial blood gas sampling is the need to perform CO-oximetry in order to assess:

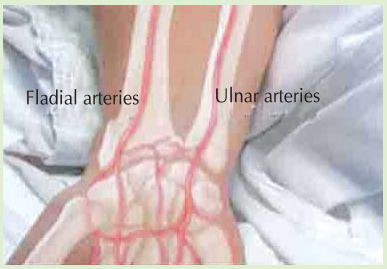
- Methemoglobinemia
- Carboxyhemoglobinemia

Preparation

Standard blood gas analysis kits contain a syringe, a small 23 to 25 gauge needle (either with a rubber stopper used to remove the needle from the syringe or with an attached safety cap), and a syringe cap containing dry lithium heparin or sodium heparin.

The concentration of heparin varies depending on the manufacturer of the kit. Alcohol swabs, gauze, tape, nonsterile gloves, and a nonsterile gown are also needed. A solution of 1% lidocaine without epinephrine can be used for local analgesia. Lidocaine can be drawn up in a 5cc syringe and administered through a small 25 gauge needle. A rolled towel is helpful in positioning the wrist. A bag of ice may be required by the laboratory for transporting the arterial sample.

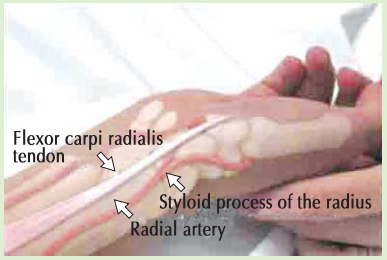
Arterial blood gas sampling often takes place in an emergency setting and may not allow for consent to be obtained from the patient or next of kin. When possible, the procedure should be explained to the patient and consent obtained.



Location of the radial and ulnar arteries

Locating landmarks

Before examining the patient, wash the hands in accordance with good hygienic standards. Extend the patient's wrist to bring the radial artery to a more superficial position. First, palpate the styloid process of the radius. Next, palpate the flexor carpi radialis tendon located medial to the styloid process of the radius. The radial artery is located between the styloid process of the radius and the flexor carpi radialis tendon.



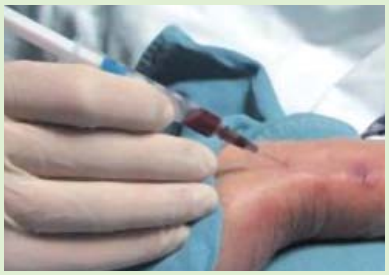
Location of the flexor carpi radialis tendon, the radial artery, and the styloid process of the radius. The radial artery is located between the tendon and the styloid process

The artery may be difficult to palpate in some patients, such as when there is overlying edema or vasospasm. In these instances, a portable Doppler ultrasound device may be used to identify the location of the radial artery.

Procedure

The patient's wrist should be extended in the supine position to bring the radial artery to a more superficial position. A rolled towel can be placed under the wrist to maintain this position. Once the wrist is positioned, put on nonsterile gloves and a nonsterile gown. Open the sampling kit and identify all the components so they are ready for use. Clean the site with an alcohol swab. Palpate the radial pulse and determine the point of maximum impulse, or use the Doppler ultrasound device to identify the location of the radial artery. Using the 5 cc syringe and small needle, load the syringe with 1% lidocaine. When first inserting the needle under the skin, pull back on the plunger to ensure that you have not punctured a vessel. Inject a small wheal of analgesic around the artery and wait 30 to 60 seconds for the lidocaine to take effect. Relocate the maximum impulse with the index and middle fingers of the nondominant hand.

Holding the arterial blood gas syringe with the dominant hand, aim the needle away from the patient's hand toward the upper arm. Puncture the skin at a 30 to 45-degree angle at a point just below the index and middle fingers of your nondominant hand. Advance the needle slowly until the syringe easily and passively fills with bright red, pulsating blood. Ideally, obtain at least 1 to 2 cc of blood. If no blood is obtained, do not pull back on the plunger; instead, withdraw the needle slowly until it is just under the skin and reattempt the procedure.



Puncture of the radial artery

After the blood sample is collected, withdraw the syringe and apply pressure to the site with sterile gauze for approximately 5 minutes. In the meantime, expel the air bubbles from the syringe. Cover the needle with the attached safety cap and remove the needle from the syringe, or use the rubber stopper to remove the needle from the syringe. Attach the heparin-containing cap and, while holding the cap in place, push the plunger of the syringe to ensure the blood encounters the heparin. This will prevent the blood from clotting. Make sure that the syringe is labeled with the patient's name and unit number. If transport to the laboratory is required, place the entire syringe in the bag of ice.

Once pressure has been applied to the puncture site for 5 minutes, affix the gauze with some tape. Dispose of all sharps in designated sharps containers.

Contraindications

- Radial arterial puncture is contra-indicated in the presence of a known deficiency of collateral circulation to the distal upper extremity
- Radial arterial puncture should not be performed in patients with an overlying skin infection
- In patients who are taking anticoagulants or in those with coagulopathies

Complications

The most common technical difficulties associated with radial arterial puncture for arterial blood gas analysis are the failure to obtain a blood sample because of vasospasm and the collection of venous blood instead of arterial blood. If vasospasm is suspected, abort the procedure and reattempt it on the other wrist. A blood sample is likely to be venous if it is nonpulsatile and dark in color and flows slowly. It should be noted, however, that extremely deoxygenated blood in a patient with hypoxemia could also appear dark, even though it is arterial. Serious vascular complications, such as radial arterial aneurysm, hand ischemia, and hematoma causing compartment syndrome, are rare but have been described in case reports.

Summary

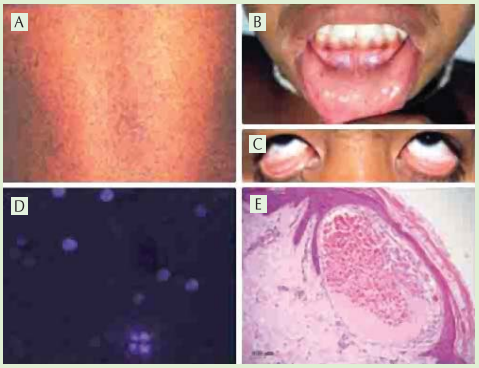
Arterial blood gas analysis provides useful information regarding respiratory and metabolic pathology. The partial pressure of carbon dioxide, bicarbonate concentrations, and pH values indicates the presence or absence of primary or mixed respiratory and metabolic acidoses or alkaloses. The partial pressure of oxygen will reveal abnormalities in the oxygen content of blood and the presence or absence of hypoxemia. With the appropriate technique, radial arterial puncture for arterial blood gas analysis is a skill easily mastered by medical trainees.

Reference: N. Engl. J. Med. Feb. 3, 2011, 364;5: e7

Fabry's disease

A 17 year old boy had hypohydrosis since early childhood; generalised telangiectasias including the palms, soles, and mucosae for the past 7 years (figure A-C); and paraesthesia of his fingers and toes for the past 4 years.

He was of short stature and had delayed puberty. His maternal uncle had hypohidrosis and pain of his hands and feet, and died of a cardiovascular event before the age of 40 years. Urine analysis showed occasional maltese cross globules on polarising microscopy (figure D).



Presentation of Fabry's disease (A-C) Telangiectasias; (D) urine analysis showing birefringent lipid molecules; and (E)skin biopsy showing angiokeratoma (haematoxylin and eosin stain)

Skin biopsy was consistent with angiokeratoma (figure E). α-galactosidase A enzyme activity was low. Nerve conduction studies showed small fibre neuropathy. His bone age was 8.42-13.05 years. Dual-emission x-ray absorptiometry scan showed osteoporosis (Z score-4). Thyroid profile and testosterone concentrations were normal. Cardiac and pulmonary function tests and ophthalmological evaluations were normal. His blood group was B^+. MRI brain and ultrasonography of the abdomen were also normal. A diagnosis of Fabry's disease (angiokeratoma corporis diffusum) was made. Fabry's disease is a rare X-linked lysomal storage disorder resulting from a deficiency of α-galactosidase A.

Reference: The Lancet, October 1, 2011, Vol. 378: 1254

Porphyria cutanea tarda

A 51 year old man with a history of heavy alcohol use, chronic hepatitis C virus (HCV) infection, and hepatic cirrhosis presented to his physician with an 8 month history of periorbital hair growth. On examination, healing crusts and scars were evident in sun-exposed areas. He described skin photosensitivity and intermittent painful blistering over the nape of the neck, the forearms, and the backs of the hands (figure A). The patient's urine had pink fluorescence under a Wood's lamp, suggesting the presence of uroporphyrin (figure B, a urine sample from the patient [indicated by an asterisk] and one from a normal control subject [N] under white light; figure C, the same two urine samples under ultraviolet A light). A diagnosis of porphyria cutanea tarda was confirmed when marked uroporphyrinuria was shown on laboratory analysis. Porphyria cutanea tarda results from decreased activity of the uroporphyrinogen decarboxylase enzyme. Although the mechanism is unknown, the sporadic form of the disease is strongly associated with chronic HCV infection. Facial hypertrichosis is common and may serve as a diagnostic clue. Although treatment of the patient's chronic HCV infection was considered inadvisable by his hepatologist, low-dose oral hydroxychloroquine, skin photoprotection, and alcohol cessation successfully controlled the cutaneous eruptions within 6 months.

Reference: N. Engl. J Med., September 22, 2011, 365; 12:1128

Allergic rhinitis

Allergic rhinitis is an immunoglobulin E-mediated disease, thought to occur after exposure to indoor and outdoor allergens such as dust mites, insects, animal danders, molds, and pollens. Symptoms include rhinorrhea, nasal congestion, obstruction,and pruritus. Optimal treatment includes allergen avoidance, targeted symptom control, immunotherapy, and asthma evaluation, when appropriate. In 2001, Allergic Rhinitis and Its Impact on Asthma guidelines were published in cooperation with the World Health Organization, suggesting that the treatment of allergic rhinitis make use of a combination of patient education, allergen avoidance, pharmacotherapy, and immunotherapy.

Pharmacotherapy

Pharmacologic options for the treatment of allergic rhinitis include intranasal corticosteroids, oral and topical antihistamines, decongestants, intranasal cromolyn, intranasal anticholinergics, and leukotriene receptor antagonists.

Intranasal corticosteroids

Intranasal corticosteroids are the mainstay of treatment of allergic rhinitis. They act by decreasing the influx of inflammatory cells and inhibiting the release of cytokines, thereby reducing inflammation of the nasal mucosa. Their onset of action is 30 minutes, although peak effect may take several hours to days, with maximum effectiveness usually noted after two to four weeks of use.

Oral antihistamines

Histamine is the most considered mediator in early allergic response. It causes smooth muscle constrictions, mucus secretion, vascular permeability, and sensory nerve stimulation, resulting in the symptoms of allergic rhinitis.

Intranasal antihistamines

Compared with oral antihistamines, intranasal antihistamines offer the advantage of delivering a higher concentration of medication to a specific targeted areas. Their onset of action occurs within 15 minutes and lasts up to four hours. Although intranasal antihistamines are an option in patients whose symptoms did not improve with oral antihistamines.

Decongestants

Oral and topical decongestants improve the nasal congestion associated with allergic rhinitis by acting on adrenergic receptors, which causes vasoconstriction in the nasal mucosa, resulting in decreased inflammation.

Intranasal cromolyn

Intranasal cromolyn is thought to act by inhibiting the degranulation of mast cells. Although safe for general use, it is not considered first line therapy for allergic rhinitis because of its decrease effectiveness at relieving symptoms compared with antihistamins or intranasal corticosteroids.

Intranasl anticholinergics

Intranasl anticholinergics (e.g., Ipratropium) has been shown to provide relief only for excessive rhinorrhea and advantages include that it does not cross the blood-brain barrier and is not systemically absorbed.

Leukotriene receptor antagonists

The leukotriene LTD4 receptor antagonist (e.g., montelukast) is effective for the treatment of allergic rhinitis. Leukotriene LTD4 receptor antagonist showed only minimal improvement in the symptom of nasal congestion.

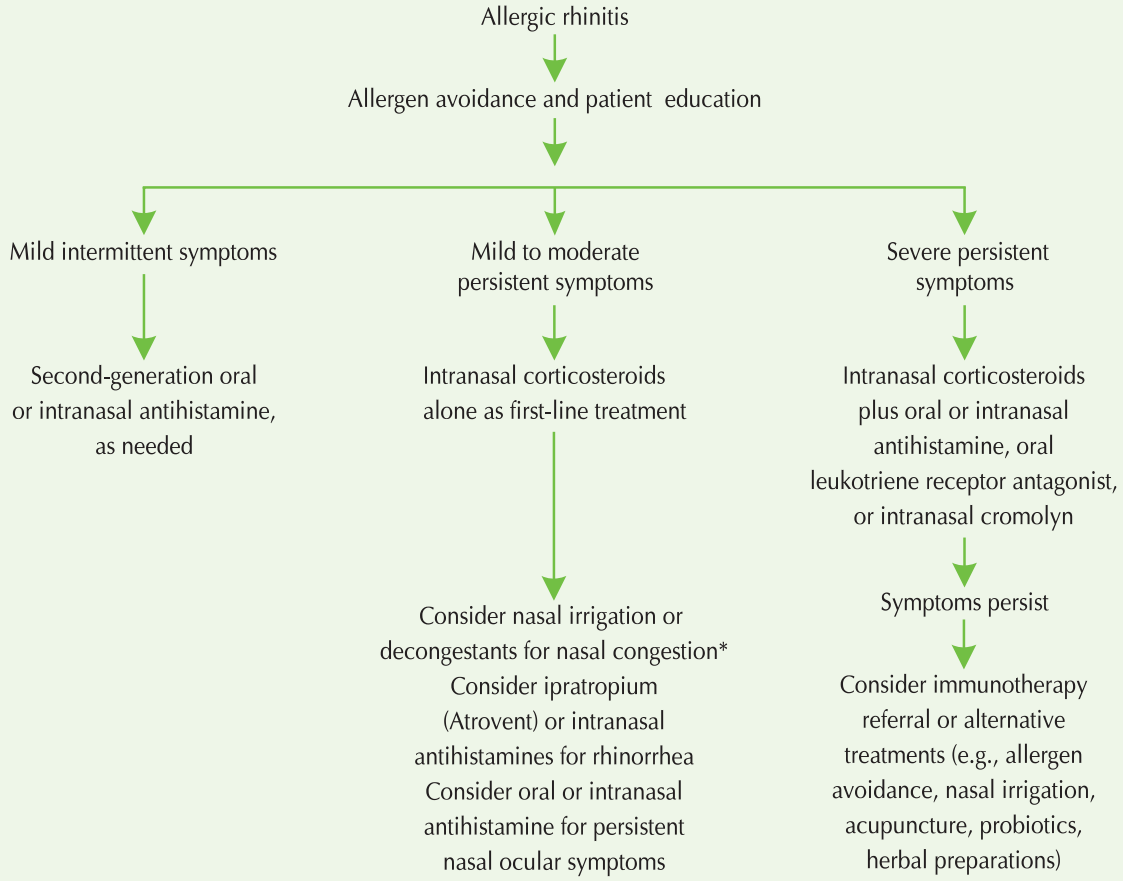
Combination therapy

The combination of an intranasal corticosteroid with an antihistamine or leukotriene receptor antagonists, most have concluded that combination therapy is no more effective than monotherapy with intranasal corticosteroids.

Immunotherapy

Immunotherapy should be considered for patients with moderate or severe persistent allergic rhinitis that is not responsive to usual treatment . Targeted immunotherapy is the only treatment that changes the natural course of allergic rhinitis, preventing exacerbation. It consists of a small amount of allergen extract given sublingualy or subcutaneously over the course of a few years, with maintenance periods typically lasting between three to five years. The greatest risk associated with immunotherapy is anaphylaxis.

Treatment of allergic rhinitis



*Use of nasal decongestants for longer than three days is cautioned because of risk of rebound congestion

Nonpharmacologic therapy

Acupuncture

The precise mechanism by which acupuncture works is unclear, proponent suggest that it releases neurochemicals such as β-endorphins, enkephalins, and serotonin, which in turn mediate the inflammatory pathways involved in allergic rhinitis.

Probiotics

Based on the limited data to date, probiotics cannot be endorsed as a useful alternative therapy for allergic rhinitis.

Herbal preparations

Many herb and plant-extract compounds have been studied with respect to allergic rhinitis treatment; but the effectiveness and safety of these compounds have not been established.

Other

Patients with allergic rhinitis should avoid exposure to cigarette smoke, pets, and allergens to which they have a known sensitivity. Nasal irrigation is beneficial in the treatment of chronic rhinorrhea and may be used alone or as adjuvant therapy. Irrigation using a neti pot is superior to saline sprays; it may also be done with a lowpressure squeeze bottle.

Prevention has been a large focus in the study of allergic rhinitis, but few interventions have proven effective. Although dust mite allergies are common, studies have not found any benefit to using mite-proof impermeable mattress and pillow covers. Other examples of proposed interventions without documented effectiveness include breastfeeding, delayed exposure to solid foods in infancy, and use of air filtration systems.

Reference: Am. Fam. Phy. 15 June 2010

Lack of outdoor play linked to short-sighted children

The time children spend outdoors could be linked to a reduced risk of being short-sighted. Researchers of University of Cambridge analysis eight studies where more than 10,000 children and adolescents were involved and they found that for each additional hour spent outside per week, the risk of myopia reduced by 2%. Exposure to natural light and time spent looking at distant objects could be key factors to reduced the risk of being short-sighted. Short-sighted children spent on average 3.7 fewer hours per week outdoors than those who either had normal vision or were long-sighted. Short-sightedness is a common eye condition that causes distant objects to appear blurred, while close objects can be seen clearly. It is much more common today in the whole world than it was just 30 to 40 years ago. Approximately 1-2% of 5 to 7 year olds have myopia. Short-sightedness results from excessively long growth of the eyeball, or a steeply curved cornea. Children were normally born long-sighted. As they grow they become less long-sighted so that by the time children stop growing their eyesight should be perfect. If a child is not born long-sighted enough then they will overshoot and end up short-sighted. This tends to happen around puberty.

Mobile phone brain cancer link rejected

Mobile phone safety has been much debated over the past two decades. Researchers said there is no link between mobile phones and brain cancer. The risk mobiles present has been much debated over the past 20 years as use of the phones has soared. The latest study led by the Institute of Cancer Epidemiology in Denmark looked at more than 350,000 people with mobile phones over an 18year period. And the study concluded users were at no greater risk than anyone else of developing brain cancer. But there has also been some research casting doubt on mobile phone safety, prompting the World Health Organization to warn that they could still be carcinogenic. It is better anyone under the age of 16 should use mobile phones only for essential purposes and keep all the calls short.

Malaria vaccine trial raises hope

A malaria vaccine has shown promising results in a clinical trial in Africa. Infants given the prototype vaccine had about half the risk of getting malaria compared with those who did not receive the jab. The vaccine, known as RTS,S, is one of two experimental malaria vaccines being tested around the world. More than 15,000 children aged under 18 months took part in the year-long study. The trial was conducted in seven African countries on two groups of children - newborns aged 6-12 weeks - and babies aged 5-17 months. One year on, there were about half the number of cases of malaria in the older group of children given the vaccine, compared with those in a control group who received vaccines against other illnesses. These initial results show that RTS,S reduces malaria by half in children aged 5-17 months during the 12 months after vaccination and that it has the potential to have an important impact on the burden of malaria in young children.

Reference: bbc.co.uk

Jog your memory

Please select the correct answer by (√) against a, b, c, d & e of each questions in the Business Reply Card and send it through our colleagues or mail within 30 December 2011; this will ensure eligibility for the Raffle Draw and the lucky winners will get attractive prizes!

1. **Treatment of atrial fibrillation with Left bundle branch block**
   a. Amiodarone
   b. Flecainide
   c. Beta blockers
   d. DC-shock
   e. Propafenone

2. **An elderly woman with type 2 diabetes has poorly controlled blood glucose levels despite treatment. The physician decides to try meglitinides. Which best describes the mode of action of meglitinides?**
   a. Reduces insulin resistance and improves insulin sensitivity
   b. suppresses basal hepatic glucose production
   c. Reduces fasting plasma glucose
   d. Activates the AMP-activated protein kinase
   e. Stimulates first-phase insulin secretion in the pancreatic β cells

3. **A patient who has been exhibiting various endocrine abnormalities has an MRI scan of the head. This scan reveals a small tumor of the pituitary gland. If this tumor expands laterally, which of the following nerves will most likely be affected first?**
   a. Abducens nerve
   b. Oculomotor nerve
   c. Optic nerve
   d. Trigeminal nerve
   e. Trochlear nerve

4. **Vascular abnormalities are a known side effect of several cytotoxic drugs. Which of the following cytotoxic drugs is most likely to lead to myocardial infarction?**
   a. Vinca alkaloids
   b. 5-fluorouracil
   c. Taxoids
   d. Cyclopentenyl cytosine
   e. Trastuzumab

5. **Allergic interstitial nephritis, as an idiosyncratic reaction, is most common as a complication of treatment with**
   a. Bronchodilators
   b. Anti-arrhythmic
   c. Antidepressants
   d. Diuretics
   e. Antibiotics

6. **Which one of the following drug produces macro vesicular fat accumulations similar to alcoholic hepatitis (Steatosis)?**
   a. Isoniazid (INH)
   b. Acetaminophen
   c. Methotrexate
   d. Oral contraceptive Pills
   e. Corticosteroids

7. **In which of the following sites do myxopapillary ependymomas most frequently occur?**
   a. Cerebellum
   b. Conus medullaris
   c. 4th ventricle
   d. Lateral ventricles
   e. Midbrain

8. **Nephrotoxicity is a known side effect of several cytotoxic drugs. Which of the following cytotoxic drugs is most likely to lead to hyponatraemia?**
   a. Cyclophosphamide
   b. 5-fluorouracil
   c. Taxoids
   d. Cyclopentenyl cytosine
   e. Trastuzumab

9. **Progression to breast cancer genes has been associated with**
   a. Mutation of BRCA1 and BRCA2 gene
   b. Mutation of DPC4 gene
   c. Mutation of p21 gene
   d. Mutation of Rb gene
   e. Mutation of p53 gene

10. **A child who has had abnormal development of the membranous bones has a broad skull with associated facial and dental anomalies. Which other bones are most likely to also be affected?**
    a. Clavicles
    b. Femurs
    c. Metatarsals
    d. Phalanges
    e. Tibias

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