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COURSE: RENAL PHYSIOLOGY

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QUESTIONS

1. Discuss the pathophysiological process involved in renal failure.
2. With the aid of diagram discuss the types of dialysis you know.

ANSWERS.

1. Renal failure also known as chronic kidney failure, describes the gradual loss of kidney function. Your kidney filter wastes and excess fluids from your blood which are then excreted in your urine. When chronic kidney disease reaches an advanced stage, dangerous levels of fluid, electrolytes and waste can build up in your body. Treatment of kidney focuses on slowing the progression of the kidney damage, usually by controlling the underlying cause. chronic kidney disease can progress to end-stage kidney failure, which is fatal without artificial filtering (dialysis) or a kidney transplant.

SYMPTOMS

Signs and symptoms of chronic kidney disease develops over time if kidney damage progresses slowly. They include;

* Nausea
* Vomiting
* Loss of appetite
* Fatigue and weakness
* Sleep problems
* Changes in how much you urinate
* Shortness of breath, if fluid builds up in lungs
* High blood pressure
* Swelling of feet and ankles
* Persistent itching

The signs and symptoms are often nonspecific, that is they can also be caused by other illness. Because your kidney is highly adaptable and able to compensate for lost function, signs and symptoms may not appear until irreversible damage has occurred.

CAUSES

Chronic kidney disease occurs when a disease or condition impairs kidney function, causing kidney damage to worsen over several months or years.

Diseases or conditions that causes chronic disease include;

* Type 1 or type 2 diabetes
* High blood pressure
* Glomerulonephritis, an inflammation of the kidneys filtering unit (glomeruli)
* Interstitial nephritis, an inflammation of the kidneys tubules and surrounding structures
* Polycystic kidney disease
* Prolonged obstruction of the urinary tract from conditions such as enlarged prostate, kidney stones etc.

RISK FACTORS

* Diabetes
* High blood pressure
* Smoking
* Obesity
* Being African American, native American or Asian American
* Older age
* Family history
* Abnormal kidney structure

COMPLICATIONS

Chronic kidney disease can affect almost every part of your body. Potential complications may include:

* Fluid retention, which could lead to swelling in your arms and legs, high blood pressure or fluid in your lungs.
* Heart and blood vessels disease
* Weak bones and an increased risk of bone fracture.
* Anemia
* Decreased sex drive, erectile dysfunction o reduced fertility
* Decreased immune response
* Damage to your CNS
* Pregnancy complications

2. there are 3 different types of dialysis;

(A). HEMODIALYSIS

Hemodialysis is the most common type of dialysis. This process uses an artificial kidney(hemodialyzer) to remove waste and extract fluid from the blood. The blood is removed from the body and filtered through the artificial kidney. The filtered blood is then returned to the body with the help of a dialysis machine.

To get the blood to flow to the artificial kidney, your doctor will perform surgery to create an entrance point (vascular access) into your blood vessels. The three types of entrance points are;

* Arteriovenous (AV) fistula; this type connects an artery and a vein. It’s the preferred option.
* AV graft; this type is a looped tube.
* Vascular access catheter; this type maybe be inserted into the large vein in your neck.

Both the AV fistula and AV graft are designed for long term dialysis treatments. People who receive AV fistula are healed and ready to begin hemodialysis two to three months after their surgery. People who receive AV grafts are ready in 2 to 3 weeks. Catheters are designed for short term or temporary use.

Risks associated with hemodialysis includes:

* Low blood pressure
* Anemia, or not having enough RBC
* Muscle cramping
* Difficulty sleeping
* Itching
* Sepsis
* Bacteremia, or blood stream infection
* Irregular heart beat

(B). PERITONEAL DIIALYSIS

Peritoneal dialysis involves surgery to implant a peritoneal dialysis (PD) catheter into your abdomen. The catheter helps filter your blood through the peritoneum, a membrane in your abdomen. During treatment a special fluid called dialysate flows into the peritoneum. The dialysate absorbs waste. Once the dialysate draws waste out of the blood stream, its drained from your abdomen. The process takes about few hours and needs to be repeated four to six times per day. However, the exchange of fluids can be performed while you’re sleeping or awake.

The types include;

* Continuous ambulatory peritoneal dialysis(CAPD); in CAPD your abdomen is filled and drained multiple times each day. This method doesn’t require a machine and must be performed awake.
* Continuous cycling peritoneal dialysis(CCPD); uses a machine to cycle the fluid in and out of your abdomen. It’s. usually done at night while you sleep.
* Intermittent peritoneal dialysis(IPD); it uses the same machine as CCPD but the process takes longer.

Risks associated with peritoneal dialysis; its associated with an increased risk of infection in and around the catheter site in the abdominal cavity.

(C). continuous renal replacement therapy(CRRT)

This therapy is used primarily in the intensive care unit for people with acute kidney failure. It’s also known as HEMFILTRATION. A machine passes the blood through tubing. A filter the removes waste product and water. The blood is returned to the body along with the replacement fluid. This procedure is performed 12 to 24 hours a day every day.

Risks associated with CRRT includes;

* Infection
* Hypothermia
* Low blood pressure
* Electrolyte disturbances
* Bleeding
* Anaphylaxis
* Weakening of bones