**Module 4 Questions**

**Renal Disease Module -**

I. **Definitions**

A. **What are renal calculi? What diet would be ordered for a patient with this condition? Is this similar to or different from the recommendations for end-stage renal failure?**

Renal calculi is called kidney stone, it’s when a solid piece of material (kidney stone) occurs in the urinary tract it’s very painful to pass it out in the urine. Therapy for kidney stones is sodium restriction, adequate fluids, restriction of animal protein or foods rich in oxalate. Consumption of juices high in citric acid, may prevent or dissolve kidney stones. In ESRD potassium and fluid is restricted in renal calculi the restriction for protein and sodium is similar.

B**. What is nephrotic syndrome?**

Nephrotic syndrome is a collection of symptoms that indicate kidney damage .Nephrotic syndrome includes the following: Albuminuria, Hyperlipidemia, edema and hypoalbuminia.

**What diet would be ordered for a patient with this condition?**

Protein requirement is 0.8 g / kg per day of body weight, 30-45 kcal per day to spare protein and prevent muscle breakdown. Sodium restriction is important if edema is present 2-3g.

**Is this similar to or different from the recommendations for end-stage renal failure?** In ESRD the nutritional intervention is not similar, in end stage renal disease potassium is restricted but if on dialysis protein is not restricted.

**C. How is “dry” weight of a patient on dialysis determined?**

Dry weight is an important concept related to patients undergoing hemodialysis. It is considered as the lowest weight at which the patient can tolerate with neither hypervolemia nor hypovolemia symptoms at the end of each dialysis session. It can be determine by bioelectrical impedance analysis. What dietary factor would be impacted the most by a patient’s daily weight versus dry weight? Intake of fluid, and sodium will have an impact patient’s daily weight versus dry weight.

II. **Pathophysiology**

1. Besides diabetes, what are some common causes of renal failure?

High blood pressure can damage blood vessels in the kidneys, reducing their ability to work effectively.

B.Describe the clinical symptoms of a patient with chronic renal failure.

Swelling, in the legs, feet, or ankles, headaches, feeling itchy, feeling tired during the day and have sleep problems at night, feeling sick in the stomach, lose the sense of taste, not feel hungry, make little or no urine, have muscle cramps, weakness, or numbness, have pain, stiffness, or fluid in the joints, feeling confused, have trouble focusing, or have memory problems.

C. Indicate normal values for healthy individuals and accepted values for dialysis patients for each of the following:

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| --- | --- | --- |
| Lab values | Healthy individuals | Dialysis patients |
| BUN | 8-20 mg /dL | 50-100mmg/dL |
| creatinine | 0.6 - 1.5 mg / dL | 2-15mg/dL |
| K+ | 3.5- 5 m Eq/L | 3.5- 5 m Eq/L |
| Ca++ | 8.5-10.2 mg /dL | 8.4-8.5 mg /dL |
| Phosphorous | 3-4.5 mg / dL | 3.5- 5 m Eq/L |
| Hematocrit | 36 - 50% | 38-50% |
| Hemoglobin | 12 - 16 | 14-18g/dL |
| Triglycerides | <150 mg / dL | <500 mg / dL |

III. **Drug Therapy**

A. Briefly discuss the use of the following drugs. Include classification,

indication and contraindication for use with the renal patient, effect of the drug on nutrient absorption and utilization, effect of nutrients on drug absorption and utilization. (You may wish to put these in the form of a table or chart.)

1. Prednisone

2. Kayexalate

3. Phos-Lo

4. Solumedrol

5. Erythropoietin (EPO)

6. Oscal

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Drug name | Usage | Contraindication | Effect of the drug on nutrients absorption | Effect of nutrients on drug absorption and utilization |
| Prednisone | Anti-Inflammatory  immunosuppressant | Grapefruit / citrus | Take with food to ↓ GI effects. ↓ Na, ↑ Ca, ↑ Vitamin D, ↑ protein. May need ↑ K, ↑ Vitamin A, ↑ Vitamin C, ↑ P (or supplements). | Can deplete K, B6, B12, or Folic Acid  Can increase Cholesterol, TG, BG, fluid retention, breakdown  of muscle & bone |
| Kayexalate | Antidotes, Adsorbents  Mineral Binding Agents  Anti-hyperkalemia | Sodium polystyrene sulfonate is contraindicated in patients with a history of hypersensitivity to polystyrene sulfonate resins. | Diet should be low in K & possibly Na | Decrease absorption of Sodium. Interactions: antacids, laxatives, diuretics, K-sparing, K |
| Phos-Lo | indicated for the reduction of serum phosphorus in patients with end stage renal disease | Hypercalcemia | May decrease the bioavailability of tetracyclines or fluoroquinolones. | None |
| Solumedrol | Anti-Inflammatory | Grapefruit juice may increase the blood levels and effects of certain medications such as methylPREDNISolone. | Dietary sodium restriction and potassium supplementation may be advisable. | Alcohol decrease drug effect, |
| Erythropoietin (EPO) | Used to treat anemia. | None | ↓ iron and vitamin B12 | Avoid high K+ foods |
| Os-cal | Used to treat low calcium | Ensure adequate Vit D consumption | ↑ Gastric pH, N/D/abd pain  Low Phos Diet | ↓ iron absorption |

B.Define high biological value protein and discuss the rationale for its use with renal patients.

HBV protein foods contain all the essential amino acids. Protein of animal source are considered high biological value. Renal patients need to eat enough protein to maintain health, but to minimize the excess amino acids and spare the kidneys. The way to do this is to eat foods with proteins that cause the least waste, that is, foods that have the right amounts (ratios) of different amino acids that the body will use most efficiently. Animal’s foods such as (dairy foods, eggs, meat, poultry, and fish) have the best combination of amino acids and produce the least waste.

**List 5 foods that contain high biological value protein**. Eggs, dairy foods, Beef, Fish, Chicken.

**A.Describe the clinical rationale for a protein restricted diet for a patient with renal failure not on dialysis.**

Unhealthy kidneys lose the ability to remove protein waste and it starts to build up in the blood. which create extra waste and fluid in the body. This result in additional burden on the kidneys this leads to further deterioration of the structure and function and could possible lead to death.

**B.Discuss vitamin/mineral supplementation appropriate for the renal patient on hemodialysis**. HD patients may receive iron supplements intravenously which is more effective than oral supplements. Renal Caps – Provide water soluble vitamins: thiamine, riboflavin, niacin, vitamin B6, vitamin B12, folic acid, pantothenic acid, biotin and vitamin C. Also vitamin D3, which helps absorb calcium. Dialysis patients have low intakes of calcium due avoiding foods containing phosphorus and potassium. Insufficient calcium may lead to renal osteodystrophy.

**Source**

Marcia Nelms, Kathryn P. Sucher, Karen Lacey, Sara Long Roth, Nutrition Therapy & Pathophysiology 2/e, 2011

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