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NUTRITIONAL CARE AND FITNESS OF RENAL PATIENTS: A REVIEW

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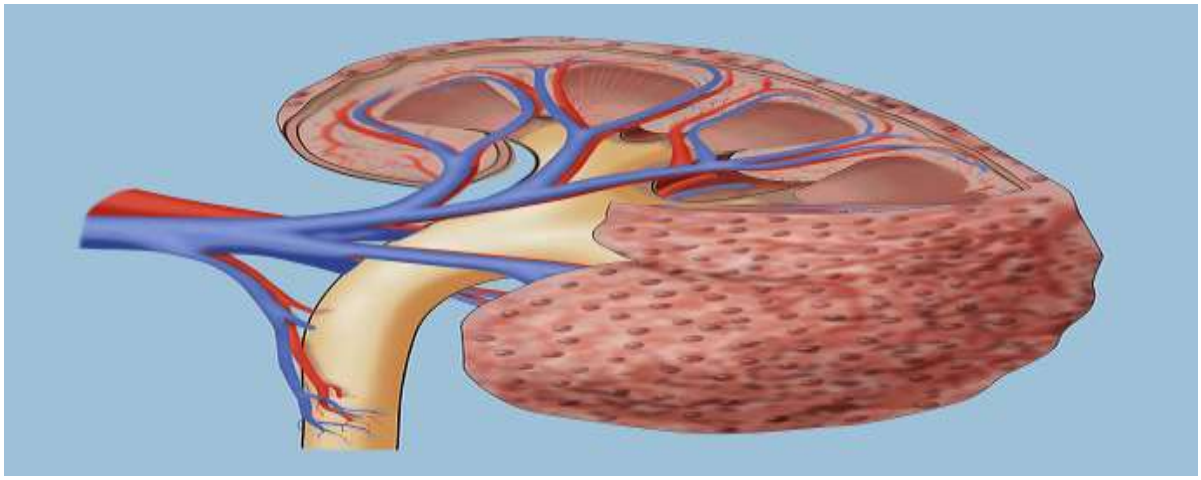
ABSTRACT

It is a common health concern that nearly 10% of the total population of the world has kidney disease. The chronic kidney disease population suffers from a high symptom burden, reduced physical activity level, and impaired physical function. This population may get an opportunity to improve their quality of life and also benefit patient outcomes through their disease progression and mortality risk by intervening through the means of physical activity and nutritional development. Compared with the age-predicted values, exercise capacity in patients with kidney failure undergoing hemodialysis is low. Increased tolerance up to 25%is seen in dialysis patients with exercise training. To cut down on the amount of waste in their body, people with compromised kidney function must adhere to a renal or kidney diet. There is a slow progression of complete kidney failure and promote kidney function by following a kidney diet. The main part is to make them understand the importance of a renal diet and a regular exercise program.

Keywords: Chronic kidney disease, quality of life, kidney diet, dialysis, kidney failure, exercise.

INTRODUCTION

16TH leading cause of years of life lost worldwide is due to **Chronic kidney disease**. The presence of an abnormality in kidney structure or a condition characterized by gradual loss of kidney function is said to be chronic kidney disease. Through routine screening with serum chemistry profile and urine studies, CKD is identified. It is generally classified by the presence or absence of systemic disease and the location of the anatomic abnormality.[1]



[Figure 1:Chronic kidney disease image]

To prevent CKD progression and cardiovascular events, effective identification and management are necessary. Filtering blood to maintain fluid and electrolyte balance and remove waste, releasing hormones to control BP, and stimulating red blood cell production are some of the vital roles of the kidney.

Smoking, hypertension, and obesity are risk factors for the development of CKD. It is commonly asymptomatic and the exact pathology underlying its development is often unknown. Attempts to prevent the progression of CKD, focusing on the treatment of primary disease, complications of CKD, and maintenance of a good quality of life is the optimal therapy for chronic kidney disease.CKD is followed by Dialysis and Renal transplantation. It is not completely curable but the betterment of the quality of life can be done by nutritional development and exercise. These interventions may reduce morbidity and mortality.

RENAL DIET

In a person diagnosed with chronic kidney disease, a renal diet menu plays a very important role in health. Especially when it comes to food intake, utmost care and discipline are crucial. Maintain a healthy diet while avoiding foods that are potentially harmful to the kidneys.

BENEFITS OF RENAL DIET

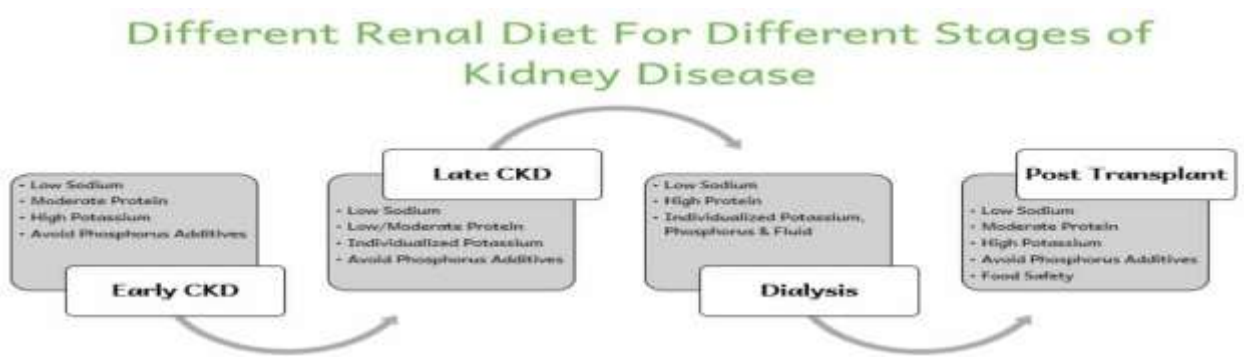
1. Control potassium and phosphorous levels. Ensuring the level of protein intake and phosphorous level in the bloodstream still maintains the strength of the bones.

2. Manage kidney disease. Since toxins can enter the body through food, the main aim is to help patients get rid of toxic substances in the body.

3. Prevent Renal progression. A renal diet must be healthy to manage the disease and it should prevent the renal failure process.

4. Reduce salt intake and maintain bicarbonate levels. Too much sodium can cause fluid retention when there are renal issues. High sodium intake may make us thirsty. This can extremely be uncomfortable for renal patients on fluid restrictive diets.

A renal diet is different for different patients. Diet may vary accordingly with the stages of chronic kidney disease



[FIGURE 2-renal diet provided in different stages of kidney disease][2]

COMPOSITION OF RENAL DIET

In the comprehensive evaluation of a patient with CKD, nutritional assessment should be the first step

- PHOSPHOROUS

At all stages of CKD, phosphorous is a concern. Bone disease, heart disease, and even faster progression of kidney disease are caused by the high level of phosphorous. Natural phosphorous is poorly absorbed. So does not have as big an impact on phosphorous levels as artificial phosphorous does. Potassium and Phosphorous content can be reduced by soaking legumes such as beans, peas, lentils, and peanuts.

[FIGURE3-phosphorous pyramid]

The Phosphorous pyramid is a visual tool designed to prevent the phosphate load of various foods. Boiling causes demineralization of foods and reduces phosphorous levels. Emerging educational initiatives include labeling using a traffic light scheme, motivational techniques, and a phosphate educational program that aims at steering patients towards the correct use of phosphorous binders. A phosphate binder should be taken to control the level of phosphorous in the blood. When phosphorous is present in the stomach, these binders act like sponges to soak up or get bound with phosphorous If there is too much phosphorous in the body, it pulls calcium from bones and can weaken the bones causing joint pain and calcifying blood vessels. As kidney disease advances, serum phosphate should be controlled by monitoring and protecting bone health.

- FLUID

Not drinking fluid and dehydration can hurt kidneys. Unless kidney disease is very advanced, do not need to limit fluid. About 2 liters of water each day must be taken by most people on a renal diet. Some conditions may need to limit fluid. they are:

-dialysis

-liver failure

-heart failure

-advanced stages of kidney disease

[FIGURE 4-fluid intake in renal patients]

- POTASSIUM

The kidney cannot process potassium properly causing it to build up in the blood. Serious symptoms like irregular heartbeat and muscle cramping are seen in potassium-increased cases. Foods are considered low in potassium if they contain 200mg or less .some are:

-berries

-apples

-grapefruit

Pineapple

-broccoli

-green beans

The potassium in canned goods leaches into water or juice in the can. If using this juice can cause an increased spike in potassium levels. Daily intake of 1500-2700mg of potassium helps in maintaining good health without impacting the kidneys.

Some of the potassium-containing foods to be avoided are:

[FIGURE 5-potassium containing foods]

- PROTEIN

In these early stages, most people should consume 0.8g of protein/kg body weight /day. On dialysis, protein needs to increase. This is essential to maintain muscle and prevent poor nutrition in people on dialysis. A protein-rich diet can cause kidneys to work too hard. Eating a smaller portion of protein such as chicken and beef is important. Proteins help in boosting the immune system to fight infections. Increased proteins may cause the following symptoms:

-soreness and aches in joints

-fever

-the clouding of urine

-puffiness

-hypertension

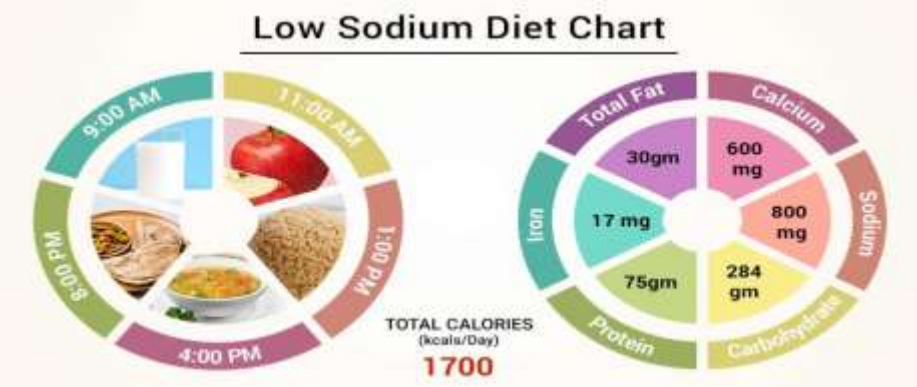
[FIGURE 6-low protein foods]

A higher amount of protein is needed for people on dialysis to maintain blood protein levels. A low protein diet is no longer needed as Dialysis treatment removes protein waste from the blood. Malnutrition and wasting will be caused due to too little protein. Depending on the stage of CKD condition, body size and nutritional status decide the amount of protein needed. An American journal published a study suggesting that eating plant-based protein sources instead of animal sources could improve the health of people with declining kidney function. The risk of heart disease, lower blood pressure, and cholesterol levels can be lowered by a plant-based diet. This diet prevents cell damage and nourishes the body with antioxidants.

- SODIUM

Sodium is an important mineral in maintaining fluid balance in the body. A direct consequence of sodium sensitivity, high BP is a frequent finding. Extra sodium builds up in the body and causes swollen ankles, puffiness, and shortness of breath. A high diet of sodium is 2300mg of sodium /day.

Cook with spices and herbs instead of salt. Avoid the use of canned, processed, and frozen food. Simple thumb rule: if salt is present in the first five ingredients, the item is too high in sodium



[FIGURE 7-sodium diet chart]

Hormone Aldosterone controls the level of sodium in the body. Rather than passing it in the urine, this hormone instructs the kidneys when to hold sodium in the body. Toothpaste, mouthwash, and aspirin consist of Sodium too. Pickles consist of about 785mg sodium content as they are preserved in the salt solution.

When CKD advances, dangerous levels of fluids, waste, and electrolytes can build up in the body and electrolytes can build up in the body. Chronic kidney disease progress to permanent kidney failure after months or years, which requires a kidney transplant or regular dialysis. The progression of kidney disease can be slowed down by a healthy balanced renal diet. This is very essential as it provides energy, prevents infection., helps in maintaining a healthy weight, and avoids a muscle-mass loss.

FITNESS CARE IN RENAL PATIENTS

One of the major causes of Chronic disease is lack of exercise and physical inactivity. This may cause osteoporosis, degeneration joint disease, and even cancer. Exercise is one of the best things you can do for yourself. A lot of oxygen is utilized in high-impact exercises, some are walking, running, stair climbing, swimming, etc. If begun at moderate intensity, exercise appears to be safe in patients with kidney disease. Mortality risk can be decreased by maintenance and improvement of physical fitness. The concentration of inflammatory biomarkers like C-reactive protein, Cytokine interleukin -Ibeta, IL-C, and Tumor necrosis factor -Alpha are reduced by exercise training.

KIND OF EXERCISE NEEDED

1. FLEXIBILITY EXERCISE

This helps in the smooth working of our joints and helps us bend, stoop, reach and move more easily. It involves gentle muscle stretching and slow movements.

2. STRENGTHENING EXERCISES

Resistance is used to make muscles harder. This makes your muscle stronger. Stop Exercising, if you develop any of these problems:

- Beginning to have shortness of breath
- Trouble seeing, speaking or trouble swallowing
- Feeling nauseous or having an urge to vomit.
- The feeling of lightheadedness
- Having a headache
- Sudden weakness in your arm or legs

3. CARDIOVASCULAR EXERCISES

Sustained rhythmic movements of your arms and legs. This exercise improves endurance.

4. AEROBIC EXERCISES

Aerobic exercises require the use of a large amount of oxygen. Walking, Jogging, Stair climbing, Swimming, Gardening, Dancing, and bicycling are some examples.

[FIGURE 8-stretching exercise]

PROGRESSION MEASURE IN FITNESS

1.LOG EXERCISE: Daily records must be kept. Week to week progress can be looked upon

2. MEASURE TIME: first exercise time, Time interval in between exercises, How long without rest?

3. MEASURE DISTANCE: Distance you walk, distance traveled by riding, swimming [4]exercises

LUNGES

To work your glutes and hamstrings, this lunge is an amazing exercise. Let's stick to the basic drop knee style.

- Keep knees at a 90-degree angle standing with your feet about three feet apart.
- Bend your lower back and your knees towards the ground
- Don’t look at your knees and keep your upper body straight as you push through the front heel and return to the starting position.

SQUATS

They have tremendous power if done properly. They are great for developing your hips, buttocks, and thighs.

- Keep your stomach in and keep your back straight. Stand evenly with your feet apart. Knees should be just behind your knees.
- Squeeze your butt as you stand and squat to the height of a chair.Repeat
- For more vigorous exercise, hold weights in your hands as you squat.

UPHILL SPRINTS/JOGS

Find a jill side and run or jog up, walk down and repeat. This exercise is not easy. Take as much time as you can go uphill and don't overexert yourself.

[FIGURE 9-image of jogging on a hill]

Avoid exercise when:-

- If there is an uncontrolled medical condition including
  -Hypotension
  -psychological barriers to exercise
  -conditions that could get aggregated by exercise**.**

SAFETY MONITORING

- Record the last measured intradialytic blood pressure and heart rate and ask the patients how they feel
- Ask the patient to report symptoms of pain, excessive fatigue, overheating, chest pain
- Ensure exercise intensity does not provoke a response greater than 15/hard on the Borg RPE scale

INDOOR ACTIVITIES FOR DIALYSIS PATIENTS

There are numerous indoor activities that people on dialysis can do as a form of exercise. Playing with kids, organizing a room, and carrying out different chores around the house.

A pedometer can be worn to monitor steps around the house. To track progress, daily steps can be logged in a fitness journal. Some of the activities are:

- Sweeping
- Vacuuming
- Dusting
- Laundry
- Mopping
- Reorganizing furniture in a room

[FIGURE 10-Indoor gardening]

WEIGHT MANAGEMENT IN HEMODIALYSIS PATIENTS

Weight management helps in providing a balance between proper diet and physical activity. Obesity is one of the independent risk factors for the development and progression of chronic kidney disease. Obesity and diabetes can be prevented by weight management.

Understanding calories is very important as it helps in tracking food intake through proper portion sizes or the amount of energy it gives the body. Normal weight without any extra fluid in the body is known as Dry weight. Our body depends on dialysis to get rid of extra fluid and waste that build up in the body when kidney disease is present. During each dialysis treatment, there is a limit on the amount of fluid to be removed safely.

MAINTAINING OF DRY WEIGHT AFTER DIALYSIS

- 32 ounces/day is the minimum amount of water required for hemodialysis patients
- Monitor fluid intake
- Salty foods should be avoided

[FIGURE 11-weight monitoring]

- Daily weight must be tracked
- Between dialysis sessions, keeping track of your weight is important
- Kidney friendly diet must be followed
- Dry weight will be adjusted by the dialysis care taken team if needed when the weight changes.

CONCLUSION

Kidney health maintenance is a global priority. Good health is always within reach of anyone, but you have to work for it. From this point, encouragement must be given in all means to cope with life. Dialysis is a normal process undergone and one should not think that life has ended. All normal activities that were done before can be performed as usual after dialysis too. Medical management goes on one hand and on the other hand build up the

confidence to face the upcoming life. Discipline and Commitment are required for Chronic kidney patients. Improvement in mental status can be done by planning nutritional development and undergoing exercise intervention. A renal diet can modify your quality of life to an extent, and workouts can improve mental fitness. Stress-free workouts are countless and it is only as who stay away from our happiness.

Evidence is compelling and the message is clear that being active provides a foundation for a longer, healthier and happier life.

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