DIETARY MANAGEMENT OF HD PATIENT

BY

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Hemodialysis

- **HD** is a process in which an artificial kidney is used to cleanse the blood. HD can return the body to a more state by removing excess fluid and waste products, but it does not replace the endocrine functions of the kidney. The average treatment lasts 4 hours and it usually required three times per week.
- **The artificial kidney** contains two compartments, one for blood and one for the dialysate bath that are separated by semi permeable membrane. Excess fluid and waste products can pass through this semi permeable membrane into the dialysate bath.
- **Dialyzer** membranes of differing thickness and surface area are used, depending on the amount of fluid and waste products to be removed. Large molecules such as albumin and RBCS are unable to pass through this semi permeable membrane, while smaller molecules such as urea, creatinine, sodium, and potassium are able to pass through it.
- To prevent transfer of unwanted chemicals into the blood, **RO water** is used as the base for the dialysate bath. The concentration of electrolytes and minerals found in the dialysate bath can be varied. The potassium content of dialysate may be 2.0 or 3.0 meq/l, the calcium ranges from 1.5-1.75 meq/l, sodium ranges from 135-150meq/l. and magnesium 0.5-1.0meq/l and sugar 200mg/dl.
- **The nephrologist selects** the artificial kidney, dialysate composition, rate of the blood and dialysate flows, and duration of dialysis on the basis of medical needs of the patient.
- **The dietitian** should design meal plans to suit individual disease states, as well as tastes, eating patterns and socioeconomic situations. Family participation should be encouraged during diet instruction. Routine follow-up is extremely important. Positive reinforcement is an ongoing responsibility of the renal dietitian and care team.

Diet Recommendation

- The **nutrition needs** of the patient vary as the residual function decreases. The patient who still has urine output has a distinct advantage over the anuric patient. A more liberal diet is possible because of the ability to eliminate some of the metabolic wastes, electrolytes, and water via the urinary tract. The diet should be re-evaluated as the patient progresses to anuria.
- **Protein** requirement for HD patient is 1.1-1.4g/kg/d. During HD, approximately 5 to 8 of free amino acids are lost into the dialysate, of which about one third consists of essential amino acids. In addition, 4 to 5 of peptide-bound amino acids are lost per dialysis. Thus, the total amount of amino acids lost is about 10-15g per treatment.
- In fasting patients, the **loss of amino acids** decreased when glucose was added to the dialysate, but in non fasting patients, addition of glucose to the dialysate did not reduce the loss of free amino acids during HD.
- **Prescribe high biological protein includes meat, fish, egg, beef, pork organ meats, milk and milk products and 40% of protein from vegetables.** **HBV proteins must be included daily intake.**
- **Energy** requirements for patients undergoing maintenance HD are approximately 35kcal/kg/d for weight maintenance, 20-30kcal/kg/d for weight loss and 35-45 kcal/kg/d for weight gain. Energy supply, along with protein intake, determines whether the diet will produce positive
or negative nitrogen balance. Unless there are sufficient calories from carbohydrates and fats, protein will be used for energy production.

- To prevent the wasting syndrome that often accompanies HD, adequate intake of carbohydrates and fats encouraged. Complex carbohydrates providing extra fiber are also stressed whenever possible, since constipation is a frequent problem in uremic patients. High fiber diet also contraindicated with potassium and phosphorus.

- Provide calories from fat should be 30-40% total calorie intake, with a polyunsaturated to saturated fatty acids ratio of 1:1. Avoid fried foods, briyane, ghee rice, parota, animal fats, egg yolk, red meat, milk and milk products, creams and sweetie items.

- The sodium requirement for a HD patient can vary from 2-3 g/d and depends largely on urine output. The more urine the patient produces, the more sodium may be eliminated in the urine. Patients undergoing HD are generally restricted to intake of 600ml of fluid plus the volume of urine output.

- Excessive weight gain, thirst, and edema are indications that the patient needs to reduce sodium and fluid intake. Avoid pickles, papads, chutney, potato chips, salted nuts, vadai, samosas, cutlets, spicy items, canned foods, drinks, salted biscuits and breads, dry fish, nuruku, hot chili.

- Potassium excretions are less in impaired kidney function. The kidney becomes more efficient at excreting potassium relative to the remaining kidney function, and fecal excretion of potassium increases.

- Avoid high potassium foods such as coconut water, curd, fruit juices, oranges, mango, jack fruit, banana, avocado, grapes, plums, amla, peas, chocolates, coffee, cola drinks, raisins, molasses, tapioca, yam, sweet potato, beets, coconut preparations, dates, berries, ice cream.

- Advice to perform leaching techniques to dialyse potassium from foods.

- Hyperkalemic patients must be dialysed with low potassium dialysate

### SAMPLE DIET FOR HD PATIENT

<table>
<thead>
<tr>
<th>Time</th>
<th>Meal</th>
<th>Menu</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.30 Am</td>
<td>Bed coffee</td>
<td>Tea or coffee (150ml)</td>
</tr>
<tr>
<td>8.00 Am</td>
<td>Break fast</td>
<td>Appam 2, or N. puttu 2, or uppuma 1cup</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Iddli 3, or dosai 1, pathri 3, or chapatti 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Egg or veg. curry. Tea or Coffee 150ML</td>
</tr>
<tr>
<td>10.30 Am</td>
<td>Mid morning</td>
<td>wheat biscuit, buttermilk</td>
</tr>
<tr>
<td>100ml or</td>
<td></td>
<td>Tea (150ml), sprouted green</td>
</tr>
<tr>
<td>gram,</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1.00Pm  Lunch  Rice or chappati
Sambar or fish, mear / beef/ curry
Fish /beef/ meat fry, Curd 100ml,
Water 100ml for medication. Apple/
Pine apple/ grapes 10/ papaya/ guava

4Pm  Mid time  Buiscuit/ rava laddu/ meat cutlet

8.00Pm  Dinner  chapathi/ rice/ appam/ dosai, sambar,
Fsh/ meat/ beef/ curry, 150ml water

- This sample diet supplies 2100 kcal/d.
- Understand patient’s clinical parameters and prescribe diet accordingly.

REFERENCES

1. DITETICS
2. HAND BOOK OF DIALYSIS
3. REVIEW OF HEMODIALYSIS FOR NURSES AND PERSONNEL