

Nutrition and Renal Disease

Teaching handout

Aims of Session

- Understand the importance of nutrition in renal disease
- Understand the rationale for dietary modification
- Raise awareness of the dietitian's role in the management of renal disease

Background of Renal Dietetic Service

4 Senior Dietitians working in Renal Medicine

- Cover Edinburgh and West Lothian
 - Inpatients at RIE:
High Dependency Unit, Renal Ward and Transplant Unit
 - Dialysis Units (RIE, WGH, SJH)
 - Low Clearance Clinics (RIE, WGH, SJH)
 - Home Dialysis/ PD Clinics (RIE, WGH, SJH)

Dietary Intervention in Renal Disease

Can include both:

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| <ul style="list-style-type: none">- Dietary education<ul style="list-style-type: none">○ Sodium○ Protein○ Energy○ Phosphate○ Potassium○ Fluid○ Post Transplant | <ul style="list-style-type: none">- Nutrition Support<ul style="list-style-type: none">○ Incidence of malnutrition○ Causes○ Assessment○ Management |
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- Intervention is individualised to each patients needs
 - Can change according to stage of renal disease (i.e.: pre-dialysis, conservative management, haemodialysis, peritoneal dialysis or post transplant)

1. Sodium

- Plays vital role in regulation of fluid balance and blood pressure
- Restriction aids compliance in fluid restricted patients
- Guidelines for general population= max 6g NaCl per day
- An estimated 75% of salt intake comes from processed foods
- **All renal patients advised on a No Added Salt (NAS) diet: 80-100mmols/day.**
 - Avoid adding salt at the table
 - Use small amount in cooking or none at all
 - Reduce intake of salty foods (e.g., cheese, smoked food, savoury snacks)
 - Limit intake of packet, processed & convenience foods
 - Avoid salt replacements (e.g. Lo salt)
 - Encourage use of pepper, herbs and spices as alternative flavourings

2. Protein

- Essential for the growth and repair of body tissues
- Protein-rich foods include:
 - Meat, chicken, fish, eggs, cheese, yoghurts, nuts, pulses, meat substitutes (Note: some high protein foods contain high levels of phosphate and potassium)
- Recommendation for protein varies according to stage of renal disease/ type of renal replacement therapy
 - **Pre dialysis/ Conservative Management**
 - Controlled protein intake (0.8-1g/kg/IBW)
 - Helps to reduce phosphate load
 - Prevents acidosis
 - May reduce ureamic symptoms
 - But must maintain nutritional status
 - Use of low protein diets is controversial
 - **Haemodialysis**
 - Moderate protein requirements (1-1.2g/kg/IBW)
 - Haemodialysis is a catabolic process
 - Aim to replace protein lost during dialysis (~4g per session)
 - **Peritoneal Dialysis**
 - High protein requirements (1.1-1.5g/kg/IBW)
 - Average peritoneal losses of 5-15g protein per day
 - Increased losses in peritonitis

3. Energy

- Adequate energy intake essential to optimise nutritional status
 - **Pre dialysis/ Conservative Management**
 - High energy requirements (30-35 kcal/kg/IBW)
 - Can have raised metabolic rate
 - **Haemodialysis**
 - High-energy requirements (30-35 kcal/kg/IBW)
 - Catabolic process raises metabolic rate
 - **Peritoneal Dialysis**
 - Moderate energy requirements (25-30/kg/IBW)
 - Account for calories absorbed from dialysis fluid (can be 70-270kcal/day)

4. Phosphate

- Phosphate control essential for prevention and management of renal bone disease, arterial stiffening and vascular calcification
- Phosphate in the diet generally associated with intake of protein:
 - Meat, fish, chicken, eggs, yoghurts, cheese, milk
- Typical UK intakes of phosphate:
 - Men: 47mmol/day
 - Women: 36mmol/day
- When GFR deteriorates to 25-30ml/min, phosphate retention can occur.
- Level of restriction depends on treatment mode, residual renal function, dietary intake, and biochemistry. (Phosphate not very well dialysed)
- Aim to maintain serum phosphate <1.8mmol/l.
- Control can be achieved via combination of:
 - 1) **Low phosphate diet**
 - Limit high phosphate foods (Cheese, yoghurt, eggs, nuts, milk, oily fish)
 - May have to restrict their phosphate intake to approx 30mmol/day.
 - However, must maintain adequate protein intake
 - 2) **Phosphate binding medication:**
 - Works in the stomach
 - Binds the phosphate in foods
 - Should **not** be taken without food as will have no benefit
 - Examples:
 - Calcichew, Phosex (Calcium containing)
 - Renegel, Alucap, Fosrenol (Non-calcium containing)

5. Potassium

- Average intakes in the UK:
 - Men 84mmol/day -Women 66mmol/day
- Restriction often required in renal patients for prevention and management of hyperkalaemia.
- Level of restriction based on treatment mode, dietary intake and biochemistry.
 - o Aim approx 1mmol per kg/IBW (e.g. 5ft 8in male ~68mmol)
 - o Often no restriction required in peritoneal dialysis
- **MUST RULE OUT NON-DIETARY CAUSES**
 - o Acidosis, ACE inhibitors, NSAID, K+ supplements, K+ sparing diuretics, salt substitute, uncontrolled diabetes
- **High Potassium Foods**

Milk

Potatoes (boiling reduces K+ content)
Potato crisps (Maize/corn better)
Fruit (limit all fruit, fruit juice, dried fruit)
Vegetables (boiling reduces K+ content)

Miscellaneous

Coffee
Milk Chocolate
Toffee, liquorice
Nuts
Salt substitutes
Wine, beer, cider
(spirits low in K+)

6. Fluid

- Restriction may be needed to prevent excessive fluid retention, depending on urine output.
- Must count foods with a high fluid content. E.g: soup, ice cream, custard, gravy, jelly.
- Recommendations:
 - o Pre-dialysis
 - Ensure adequate fluid intake (2-2.5L per day)
 - May require restriction when nearing ESRF
 - o Haemodialysis
 - Varies depending on residual renal function
 - Usually 500mls + PDUO
 - Intradialytic weight gains of >2kg indicate excessive fluid intakes
 - o Peritoneal Dialysis
 - Varies depending on residual renal function and ultra filtration
 - Tends to be less restricted than in haemodialysis
- Aim to give practical tips: using smaller cups, sucking ice-cubes

7. Dietary Intervention Post Renal Transplantation

- Ensure adequate nutritional intake post-op
 - Ensure adequate intake of fluid and electrolytes during polyuric phase
 - Dietary restrictions can usually be discontinued
 - Education on discharge
 - Healthy eating
 - Food safety, drug interactions
 - Adequate calcium for bone preservation
 - Potential to develop obesity, hyperlipidaemia and steroid induced diabetes.
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Malnutrition

- **40-50% of HD and PD patients are malnourished**
- Affects morbidity and mortality rates
- Very difficult to reverse once evident
- **Causes:**
 - Increased hospital admissions
 - Infections
 - Inadequate dialysis/ acidosis
 - High nutritional requirement
 - Limited fluid intake
 - Intra-abdominal pressure in CAPD
 - Social/ lifestyle
 - Concurrent illness
 - Uremia
 - Drugs
 - Anaemia
 - Restrictive diets
 - Depression
 - Economic factors
- **Assessment:**
 - Consider all factors that relate to nutritional status
 - Diet history and any changes in dietary intake
 - Weight history
 - Anthropometric measurements
 - Underlying medical condition & treatment
 - Biochemistry
 - GI symptoms
 - Social and psychological factors

- **Management:**



**Must also optimise medical management
(dialysis adequacy, acidosis, infection)**