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DIET IN CHILDREN WITH RENAL DISEASE

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CARIBBEAN TOTS TO TEENS



CHRONIC RENAL DISEASE

is a
major public health issue
worldwide,
with an increase in
End Stage Renal Disease (ESRD)

NUTRITION MANAGEMENT DIETARY INTERVENTION

In Jamaica, treatment of ESRD patients involves:

- ▶ Medication
- ▶ Dietary Intervention, and
- ▶ Replacement Therapy

GOALS OF DIETARY INTERVENTION

- ▶ Promote normal growth while maintaining good nutritional status.
- ▶ Prevent or slow deterioration in renal function.
- ▶ Minimize uremic toxicity
- ▶ Control blood pressure by reducing sodium intake.
- ▶ Provide sufficient dietary freedom for the child to lead a near normal life.

RENAL DIET

CONTROL INTAKE OF:

- ▶ PROTEIN/ENERGY
 - ▶ POTASSIUM
 - ▶ PHOSPHORUS
 - ▶ SODIUM/FLUIDS
- 

PROTEIN RESTRICTION

Is the major component in the nutritional management of Chronic Renal Disease.

Too little protein and the patient can develop malnutrition and retard growth.

Too much protein can result in an increase in blood urea nitrogen levels (BUN).

Amino Acids should be enough to support Normal nitrogen balance and encourage adequate growth without increased BUN.

PROTEIN

- ▶ Some studies suggest that protein intake in children with chronic renal failure should not be lower than 1.0-2.0 gm/kg IBW
- ▶ Others claim that protein intake can be restricted safely to 0.8-1.1gm/kg/IBW to prevent the accumulation of nitrogenous waste and the lowering of dietary phosphorus intake
- ▶ Hemodialysis recommended intake: 1.5 to 2.0 gms/kg IBW
- ▶ Peritoneal Dialysis recommended intake:1.8 to 2.3gms/kg IBW

TIP

**60% to 75% should be High Biological Value
e.g. Eggs, Fish, Poultry, Milk & Meat.**

ENERGY/ CARBOHYDRATES & FATS

Carbohydrates & Fats

play a major role in energy production.

- ▶ In children the need for CHO. and Fat is greater.
- ▶ Restriction of dietary Protein requires a change in the proportion of calories contributed by CHO. & Fats.
- ▶ Complex CHO. containing Protein must be accounted for – e.g. whole grains and dried beans.
- ▶ Simple CHO. such as concentrated sweets & corn starch may be substituted.

FATS

- ▶ Heart-healthy Unsaturated Fats are encouraged
 - ▶ E.g. Olive, Corn, Coconut (monounsaturated) oils
- ▶ Fats in the form of creams, sauces, margarine & ice cream increase calorie intake.
- ▶ Patients with CRF often develop cardiovascular complications due to increased serum LDL and decreased HDL.
- ▶ Maintain a polyunsaturated: saturated fat ratio of 2:1
- ▶ Restrict cholesterol to <200 mg/dl.

POTASSIUM RESTRICTION

- ▶ When serum K levels exceed 5.5mEq/L and urine out-put is less than a 1000 ml/day restriction is needed.
- ▶ Pre-dialysis: *restrict to 50 -60 mEq/day*
- ▶ Dialysis: *restrict to 38-75 mEq.*
- ▶ Peritoneal Dialysis: *No restriction may be necessary*

*Many foods are high in potassium,
close monitoring is critical.*

TIP:

**Potassium contents of starchy vegetables, roots & tubers
can be reduced by
leaching prior to preparation**

PHOSPHOROUS RESTRICTION

- ▶ Phosphorus control is necessary for the CRF patients mainly to prevent ***renal bone disease***.
- ▶ Recommended intake:
 - ▶ pre-dialysis -10-12mg/kg IBW
 - ▶ dialysis <17 mg/kg IBW.
- ▶ Serum Phosphorus is best controlled with the use of phosphate binders.

*Dairy products & some high protein foods may be **high** in phosphorus*

TIP

For normal growth & healthy bones in children give oral **calcium** & **Vitamin D** supplements

SODIUM/FLUIDS

- ▶ Sodium intake is based on the child's weight, BP, and expected losses.
- ▶ Normotensive 2 mEq kg/day
- ▶ Hypertensive 1mEq/kg/day

*The average meal of a 12 year old child contains **approx. 500 mls of water** in food **not** included in the fluid allowance.*

TIP

Fruits & vegetables contain 99% water, Fish, poultry, & meats contain about 50%

- ▶ Avoid foods that are cured, smoked, & salted.

RENAL REPLACEMENT THERAPY

- ▶ HEMODIALYSIS
 - ▶ PERITONEAL DIALYSIS
 - ▶ RENAL TRANSPLANTATION
- 

HEMODIALYSIS

INCREASED NUTRITIONAL REQUIREMENTS

- ▶ Requirements should be increased as soon as the patient starts dialysis.
- ▶ Increase protein to at least 1.2gm./kg IBW
 - ▶ high biological value protein
- ▶ Increase Carbohydrates and Fats to ensure positive nitrogen balance, adequate growth, and prevent malnutrition.
- ▶ Other important nutrients - Vit B6, Vit C, Iron & Zinc.
 - ▶ Iron deficiency anemia (frequent) can be treated with iron supplements
 - ▶ erythropoietin (EPO) used to stimulate bone marrow in CKD when iron stores are normal
 - ▶ Zinc supplement improve taste sensitivity and appetite

PERITONEAL DIALYSIS

- ▶ Peritoneal dialysis is simple, safe, & easily adapted for children.
- ▶ Residual renal function is better preserved, allowing a more liberal diet, and better fluid balance.
- ▶ Typically patients lose 6-12gms of protein per treatment via the dialysis so protein needs are generally in the range of 1.5-2.5gm/kg IBW
- ▶ Patients often suffer nausea, satiety, and anorexia due to the presence of dialysate in the abdomen, so small frequent meals are recommended

RENAL TRANSPLANTATION

- ▶ Kidney transplants are particularly desirable for children because they can restore kidney function & normal growth.
- ▶ High protein intake 1.5-2.5gm/kg IBW post-transplantation is recommended to maintain nitrogen balance, wound healing, and prevent infection.
- ▶ Carbohydrates and fats provide calories for energy. Emphasis polyunsaturated and monounsaturated fats not saturated.
- ▶ Sodium intake is often limited to 87-130mEq /day in the acute post-transplant period, to control the sodium and fluid retention experienced with corticosteroid treatment.

NUTRITIONAL CHALLENGES

DIET is an important part of the *treatment plan* for children with CRD.

These patients face many nutritional challenges:

- ▶ Altered metabolism
- ▶ Poor nutrition intake
- ▶ Uremia
- ▶ Dialysis related loss of nutrients
- ▶ Anorexia
- ▶ Lethargy/tiredness.

NUTRITIONAL SUPPLEMENTS

Nutritional supplements are available for renal patients.

1. Suplena - recommended for pre-dialysis patients.
2. Nepro - high in protein (19.1g per 8 fl oz) high in calories, low in phosphorus, potassium, and sodium; nutrient dense and low volume

In some cases **tube feeding** is often the best way to ensure a child gets the full supply of fluids and nutrients needed to promote growth and development

CONCLUSION

Diet Therapy remains a vital tool in the treatment of patients with various degrees of Renal Disease.

Protein restriction has been shown to be beneficial in preventing renal deterioration in CRF, however some studies suggest this therapy may negatively affect pediatric patients.

The **mobility and mortality rate** for ESRD patients remains relatively high. **Malnutrition** is one of the major causes. Mortality rates remain significantly lower for pediatric ESRD patients when compared to adults.

There is a need for increased research in the use of early dietary intervention.

QUESTIONS AND COMMENTS ARE
WELCOME

THANK YOU!

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