MEDICAL UNIVERSITY - PLEVEN
FACULTY OF MEDICINE

DISTANCE LEARNING CENTRE

DEPARTMENT OF "NEPHROLOGY,

HEMATOLOGY AND GASTROENTEROLOGY"

PRACTICAL EXERCISES – THESES

FOR E- LEARNING IN NEPHROLOGY

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SPECIALTY OF MEDICINE

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MANAGEMENT AND THERAPY OF CHRONIC RENAL FAILURE

I. **Goal of this exercise** – The students have to learn management of the patient with chronic renal failure.

The management includes:

1. Treatment of the underlying renal diseases and various reversible factors with cause exacerbation of the uremic state. This will prevent further renal damage.
2. Restriction of the adverse effect of renal failure.
3. Dialysis methods and renal transplantation as methods of replacement therapy.

Treatment of the chronic renal failure begins with conservative methods. **The conservative therapy** includes:

A. **Etiologic therapy**. It is considered in regard to underlying renal disease, e. g. an exacerbation of chronic pyelonephritis always requires etiologic antibiotic therapy despite of the severity of renal failure. Chronic glomerulonephritis requires a pathogenic therapy only in I/II/ degree of CRF.

B. **Pathogenetic therapy** in regard to various factors, which lead to exacerbation or progression of the CRF.

C. **Symptomatic therapy**:

Diet

Adequate nutritional supply is very important as a part of the care for the patient. Careful dietary instructions are essential for keeping energy and protein intake, and for restricting salt and water overload, etc.

- Restriction of sodium intake is required when patients have hypertension. /about 1-2 g daily/.

- Restriction of potassium intake is essential in, II, III, and IV stage of CRF when urine output is less than 1000 ml/day.

- Restriction of water intake is needed, when patients are in end- stage CRF or undergo dialysis.

- Protein intake should be 1.0- 0.5 g/kg BW/d. To improve the protein catabolism some essential amino acids can be administered as Ketosteril-tabl. 3x 4 tabl. per day.

- Restriction of phosphate intake is essential in the prevention and therapy of renal osteodystrophy. Daily intake of phosphate should be less than 1000 mg. That means the patient have to restrict intake of some foods as: milk, cheese, nuts, fish, etc.

- An adequate daily intake of Calcium is of primary importance in CRF patients to prevent hypocalcemia and hyperphosphatemia and as a result to prevent or blunt secondary hyperparathyroidism. Daily intake of calcium should be about 1500 to 2000mg /with food and medicine/.

Attempt for improvement of renal function

It is necessary to be achieved a diuresis more than 2- 2,5 l per day. For this purpose water- salt infusions and/or diuretics can be used. In the condition of CRF Furosemide or others loop diuretics are appropriate. Their doses depend on the degree of CRF e.g.:

I stage of CRF- 20- 40 mg per day Furosemide

II stage of CRF- 80- 120- 240 mg/daily Furosemide

III stage- 320- 500 mg/d Furosemide

IV stage- 500-1000 mg/d Furosemide

Management of the hypertension in CRF-

The control of the hypertension is necessary to protect kidneys from additional impairment.

The treatment of hypertension is complex and includes:

-. Dietary restriction of salt intake- less than 2g/daily.

-. Appropriate daily routine.

-. Removal of any adverse factors such as smoking, alcohol drinking, use of too much coffee, anxiety, etc.

-. Medicamentous treatment.

-. Hemodialysis or peritoneal dialysis.

Hypertension may be controlled by any of the following antihypertensive drugs administered as monotherapy.

 # Angiotensin converting enzyme inhibitors

 # Beta- adrenergic blockers

 # Calcium channel blockers as:

 # Central acting Alfa- adrenergic agonists

 # Alfa- adrenergic blockers

The guidelines for selection of an antihypertensive drug in patients with CRF include coexisting disease /Diabetes mellitus, Coronary artery disease, Hear failure, Peripheral vascular disease, etc. / individual patient's response, adverse effects of the drugs, etc.

Management of the uremic pericarditis

Pericarditis is very common in end stage CRF. It can impact the condition of the heart, increase the level of heart failure and level of mortality in uremic patients. Because of this pericarditis always requires appropriate treatment.

1. Antibiotic therapy - We usually use Penicillins, Cephalosporins /I, II, rarely III generation/. They are administered parenterally.
2. Systemic corticosteroids - Initiate dose is 40- 60 mg per day, tapered rapidly over several weeks.
3. When the uremic pericarditis is occurred in a patient with end- stage CRF, it is an indication for dialysis treatment. Many patients respond well to intensive dialysis.
4. Operative intervention- If the pericarditis is complicated with pericardial effusion, the patient may requires surgical intervention as pericardiocentesis/ the most recommended surgical method/, subxiphoid pericardiotomy, Pericardiectomy.

Heart failure and Cardiomyopathy

Uremic cardiomyopathy and heart failure are main factors that can lead to higher level of morbidity in uremic patients. The goal of treatment of HF is to relieve its symptoms, to improve patients' life style, and to prolong their life.

A. The treatment begins with identification, correction and if it is possible - with elimination and prevention of the precipitating factors of HF. They are:

- **Hypertension** - it must be controlled with drugs and dialysis.
- **Excess of fluids** – Restriction of water and salt intake, diuretics, and dialysis
- **Anemia**
- **Coronary disease**- Medicamentous and surgical treatment includes vasodilatators, Beta- blockers, blockers of the calcium channels, coronary bypass, PTCA, etc.
- **Pericarditis**
- **Hyperparathyroidism.**
- **Arrhythmia** and others.

B. If Heart failure does not respond to elimination of identifiable causes, other agents are required.

C. **Dialysis treatment.**

D. Treatment of the Acute HF:

1. Diuretics in high dose- Furosemide- amp. 20 mg, administered as 100mg i.v.
2. Vasodilatators to decrease heart preload and afterload- NTG in appropriate dose.
3. O_2 therapy
4. Broncho-dilatators. - Novphyllin- 240 mg, i.v.
5. Corticosteroids - Urbason 40- 60 mg, i.v.

6. Dialysis.

Anemia

Treatment of the anemia improves the quality of patient's life, the function of the brain and the heart, etc.

The management of anemia includes:

1. **Therapy with Human Recombinant Erythropoietin /Epo/**
2. **Iron therapy**
3. **There should be determined and eliminated all causes that can blunt the response of Epo as:**

-. Inflammation

-. Secondary hyperparathyroidism

-. Chronic hemorrhages

-. Hypocalcemia

-. Myeloma malign

-. Others.

4. **Improvement of the dialysis treatment**- the adequate dialysis therapy is very important for the patients undergoing dialysis.

Treatment of Hyperkalemia

Therapy of osteodystrophy

Acid- base balance /ABB/

Replacement of renal function

Dialysis methods should be initiated in patients with end stage CRF, when despite the adequate medicamentous treatment the symptoms of uremia become anxious.

There are three methods of dialysis- Hemodialysis, CAPD, Hemofiltration. These methods can replace partially excretory function of the kidneys but not and their endocrine and metabolic function.

Hemodialysis - Indications:

1. Clinical indications;

- General condition of the patient

- Presence of complication of the cardiovascular system such as pericarditis, heart failure, pulmonary edema, arrhythmia, etc.

- Presence of complication of the gastro- intestinal system- severe anorexia, nausea, vomiting, diarrhea, etc.

- Clinical and ECG feature of hyperkaliema

2. Laboratory data:

- Urea>30 mmol/l
- Cr > 700- 800 mkmol/l
- K> 7 mmol/l
- pH<7,1 mmol/l
- Severe heart failure, etc.

Vascular access for hemodialysis is essential. There are two kinds of vascular access- temporary and permanent vascular access. **CAPD /Continuous ambulatory peritoneal dialysis/**

Renal transplantation.