MEDICAL UNIVERSITY - PLEVEN
FACULTY OF MEDICINE

DISTANCE LEARNING CENTRE

DEPARTMENT OF "NEPHROLOGY,

HEMATOLOGY AND GASTROENTEROLOGY"

PRACTICAL EXERCISES – THESES

FOR E- LEARNING IN NEPHROLOGY

ENGLISH MEDIUM COURSE OF TRAINING

SPECIALTY OF MEDICINE

ACADEMIC DEGREE: MASTER

PROFESSIONAL QUALIFICATION: DOCTOR OF MEDICINE

PREPARED BY DEPARTMENT OF NEPHROLOGY

PLEVEN, 2020

IA. DIABETIC NEPHROPATHY

1. Definition

Vascular-degenerative process in diabetes mellitus, manifestation of diabetic microangiopathy, morphologically characterised by forming of "nodes" in the glomeruli and glomerular renal basal membrane thickening. Clinically manifested by arterial hypertension, proteinuria and oedemas and progressive renal insufficiency.

2. Brief description of diabetes mellitus forms

The students define the factors for vascular complications' development: diabetic macroangiopathy and diabetic microangiopathy.

3. Examination of a patient having diabetic nephropathy

Anamnesis: The students ask in details about:

1. First line relatives having hypertension and diabetes mellitus
2. Determine as accurate as possible the disease term (duration)
3. Ask in details about the observed diet, the amount of consumed proteins, salt and fats, smoking.
4. Ask about the type and the length in months and years of the oral anti-diabetes medicines and the Insulin dose, type and duration.
5. The students systematically and constantly ask for the earliest manifestation of:
    - Arterial hypertension
    - Oedemas
    - Increase of residual-nitric bodies (urea – BUN and creatine)

Physical examination (status) of the patient:

The students have to consider a generalised swelling of the face, mainly the eyelids, the body, the abdomen wall and sacrum and specially the legs, the ankles and the feet. During the joint examination the assistant emphasises the "testability" of the present oedema.
In cardio-vascular system examination special attention is paid to the arterial pressure of both hands, the symmetric pulse wholeness of the large arteries, the hypertension evolution gradually beginning but steadily developing to a high diastole.

Tests: The students have at their disposal the following test:

- Haematological
- Biochemical

- Urine

These tests have to support the formulation of working diagnoses and differential diagnoses.

- ❖ *haematological tests* – haemoglobin, erythrocytes, haematocrit and leukocytes are **not** changed in the early stage of nephropathy. Normochrome, normocytic anaemia is typical for the initial stage of renal insufficiency as Erythrocytes Precipitation Rate is compulsory accelerated. The importance of haemoglobin A_{1C} defining is emphasised again for glycaemic control assessment.
- ❖ *biochemical tests* are basic for diagnoses and assessment of nephrosis syndrome in diabetic nephropathy.

- sugar blood profiles and the sugar blood deviations above 5,6- 6,0 mmol/l give a current assessment for the compensation.
- lipid exchange – increase of IV type of Frederixen is characteristic for the nephrosis syndrome (hypercholesterolemia carbohydrate induced above 6,7 ml/l).
- protein exchange – hypoproteinemia - below 66 g/l, hypoalbuminemia below - 36,0 g/l, hypergammaglobulinaemia - above 23% of the proteinogram. The assistant emphasises the secondary changes in the protein plasma profile following proteinuria chronologically
- the rates of residual-nitric bodies (urea > 8,3 mmol/l; creatine > 123 μmol/l, uric acid) increase after years of diabetic nephropathy evolution at the beginning of chronic renal insufficiency stage.

- ❖ *urine tests*

- Introducing the term microalbuminuria – urine excretion rate of albumin between 20-200 μg/min as the normal rate is 20 μg/min. The significance of this factor is underlined as it precedes with years the manifested proteinuria and oedema syndrome.
- proteinuria (slight, moderate, massive) progresses from 300 mg/24 h to 5-15 g/24 h as it increases with the morphological changes intensification.
- urine sediment is deficient in cells in the pure form of nephropathy
- urine cultures are sterile

- ❖ At the beginning the renal function is characterised by increased glomerular filtration flow – hyperfiltration > 150 ml/min, later by norm filtration and finally – decrease below < 50 ml/min.

❖ Renal ultrasound test at the earliest stages shows slightly enlarged dimensions. But even in the final stages of renal insufficiency the kidneys in diabetes mellitus are not with greatly decreased dimensions.

4. Preparing of working diagnosis

The assistant summarises together with the students the syndromes ensuing from the anamnesis, the physical test and the applied tests:

- hypertension-vascular
- of oedemas
- of renal insufficiency

In this connection the assistant highlights the major importance of **early** diabetic nephropathy diagnosis. It is based on:

1. glomerular hyperfiltration
2. microalbuminuria
3. holter perceptible slight arterial hypertension.

❖ Writing in Latin of the working diagnosis

5. Discussion of differential diagnosis

6. Therapy

1. Optimized and intensified therapy with:
- Insulin – pens and pumps
- oral antidiabetes medicines
2. Pathogenic therapy with ACE inhibitors
- proven reduction the increased glomerul filtration flow
- microaluminuria and proteinuria are reduced
3. Symptomatic therapy – in case of developed clinical manifestation of diabetic nephropathy.
- antihypertensive agents
- Protein solutions in case of hypoalbuminemia – it is emphasised that the correction is short-term (48 hours)
- Diuretics
- Vascular-stabilising and dilators

❖ Writing a prescription