MODULE 7 : Urinary System

Biochemistry – Undergraduate Programme

Faculty of Medicine and Allied Sciences
Rajarata University of Sri Lanka

Broad Objectives

At the end of this course, a student is expected to,

1. know the molecular mechanisms that determine the excretion of urinary constituents and their composition in health and disease.
2. know the constituents of renal stones and preventive measures to reduce the incidence of urolithiasis.
3. analyse urine for abnormalities and microscopically examine the urinary deposits.

Specific Objectives

1. Urinary Constituents

1.1 Explain the molecular basis for excretion of metabolites in the urine.
1.2 State the composition of normal urine.
1.3 Recall the pathways and the sites of production of the major nitrogenous constituents.
1.4 Explain the change in the composition of the normal constituents and the presence of abnormal constituents in disease conditions;
a) diabetes mellitus b) jaundice c) snake bite d) crush injury e) nephrotic syndrome f) cirrhosis g) multiple myeloma h) gout i) urinary tract infections j) acute and chronic renal failure

2. Urolithiasis

2.1 Recall the composition of the common types of renal stones.
2.2 State the dietary and metabolic factors that promote different types of urolithiasis and explain measures that could be taken to reduce them.

3. Laboratory Investigations

3.1 State and explain the use of change in the normal composition and the presence of abnormal constituents in the urine in clinical diagnosis.
3.2 Explain the use of microscopic examination of urinary deposits in clinical diagnosis.

3.3 Recall the use of specific chemical tests for screening of inborn errors of metabolism.
a) phenylketonuria b) alkaptonuria c) aminoaciduria
3.4 Distinguish between haematuria and haemoglobinuria & recall the clinical conditions that give rise to them
3.5 Explain the role of preservatives when collecting a 24h sample to test for a) protein, b) porphobilinogen, c) creatinine, d) VMA, e) 17-ketosteroids

4. Objectives for Chronic Kidney Disease (CKD)

4.1 Recall the functions of kidney and the kidney function tests learnt during the first semester
4.2 Define chronic kidney disease
4.3 State the stages of chronic kidney disease and how such stages are identified biochemically
4.4 State the common causes of chronic kidney disease
4.5 State the factors affecting the progression of chronic kidney disease
4.6 List the common signs and symptoms of chronic kidney disease
4.7 Know the blood, urine and other investigations performed for the diagnosis and monitoring of kidney functions
4.8 State the complications of chronic kidney disease
4.9 State how chronic kidney disease could give rise to anemia, gout and renal osteodystrophy
4.10 Explain why an individual with CKD & diabetes have a lower requirement for insulin
4.11 Know that moderate protein, low calcium, phosphate and sodium diets are recommended for CKD patients and the reasons for the same
4.12 State the type of treatment available for CKD patients and the reasons
4.13 Know that chronic kidney disease of unknown etiology (CKDu) is high in North Central, North western and Uva provinces of Sri Lanka
4.14 Know the prevalence of CKDu among various parts of NCP
4.15 State the possible causative factors of CKDu in NCP

Prof. P.A.J. Perera

Department of Biochemistry
Faculty of Medicine and Allied Sciences
Rajarata University of Sri Lanka
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