

BILINGUAL MANUAL OF NEPHROLOGY

肾脏内科学 双语手册

严海东 庄守纲 主编

学林出版社

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尹海龙 张博群 主编

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前 言

21 世纪是以生命科学为主导、科学技术迅猛发展的世纪,医学在生命科学中占有极其重要的地位。随着信息技术为主要标志的知识经济时代的到来,世界各国的交流将进一步加强,世界一体化的进程将不断推进,因此必然急需一批懂外语又有专业知识的高素质人才。临床医生、研究生和医学本科生需在掌握医学理论知识的基础上,系统掌握相应的专业英语知识。因此,对医学生实施双语教学,有利于全面提高外语能力,加强医学生综合素质、创新精神和实践能力,提高其终生学习、获取信息与知识的能力。

肾脏是人体十分重要的器官,肾脏疾病多涉及全身各个系统。目前,慢性肾脏疾病发病率逐年升高,保护肾脏和预防肾脏病已成为全世界关注的公共卫生问题。肾脏内科医师更需要不断汲取新的信息和知识来充实、更新已有的知识,从而更好地为广大的肾病患者服务。为此,我们编写本手册,旨在为提高临床医学生以及肾内科中青年医师的医学专业英语水平提供帮助和参考。

严海东

Foreword

The twenty-first century has witnessed a rapid development of science and technology, particularly life science, of which medical science is a key part. Medical professionals with a good command of English are in great demand as a result of increasing globalization and international exchanges in the era of knowledge economy marked by the information technology. Clinicians and medical graduates and undergraduate students are, therefore, required to master not only specialized knowledge but medical English as well. The application of bilingual teaching helps to improve the students' English competence, promote their holistic quality, creativity and practical skills, and facilitate their life-long study for knowledge and acquisition of information.

As the kidney plays an important part in the human body, diseases related to the organ often affect other systems as well. The annually increasing number of kidney patients has created a public health problem of worldwide concern as to how to protect the organ from diseases. In order to help those patients, nephrologists need to further and update their knowledge. This book, therefore, is aimed as a bilingual reference book for both medical students and young nephrologists to improve their expertise.

Yan Haidong

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1. 肾脏病学总论

泌尿系统是由肾脏、输尿管、膀胱、尿道以及相关的血管和神经组成的。肾脏不仅是机体重要的排泄器官,也是一个内分泌器官。肾脏在维持细胞外环境稳定和水、电解质平衡方面起了重要的作用。

I. 肾脏的生理功能

肾脏有许多基本的生理功能。第一,它可以通过排泄一些废物如尿素、肌酐、尿酸以及其他物质使细胞外保持良好的内环境。维持水、电解质平衡是肾脏的另一个重要功能。肾脏每天滤过大量的血液,滤过液中大部分的氯化钠、碳酸氢盐和水分被重吸收,同时,一些重要的小分子物质(如磷)也被重吸收。此外,肾脏还选择性地重吸收某些重要的分子如氨基酸和葡萄糖,以及特异性地分泌一些机体不需要的物质。第二,肾脏通过产生各种激素来调节全身和其本身的血流分布,同时也调节水、电解质平衡,诸如肾素、血管紧张素Ⅱ(AⅡ)、前列腺素(PGs)、内皮素、一氧化氮、腺苷以及缓激肽等激素能调节血管活性和肾脏的血流。第三,肾脏可产生某些激素,作用于各种终末器官而发挥不同的生理功能。

1. Nephrology Remarks

Urinary system consists of kidney, ureter, bladder, urethra and related blood vessel and nerve. The kidney is not only a major excretory organ in the body, but also an endocrine organ. The kidney plays an important role in maintaining the stable extracellular environment and water-electrolyte balance.

I. Physiological function of the kidney

The kidney is designed to perform a number of essential functions. Firstly, it achieves an optimal extracellular environment through the excretion of waster products, such as urea, creatinine, uric acid and other substances. Keeping the water-electrolytes balance is another important function of the kidney. The kidney filters a large volume of blood each day, in which most of the sodium chloride, bicarbonate and water are reabsorbed, together with other small, important substances, e.g. phosphate. In addition, some essential molecules like amina acids and glucose, and specific secretion of unwanted substances are selectively reabsorbed. Secondly, the kidney regulates systemic and renal blood flow distribution through the

肾脏产生促红细胞生成素刺激红细胞的生成。肾脏产生的活性钙以及肾对钙磷的适当调节可影响骨的代谢。第四, 禁食情况下肾脏参与糖原合成, 以预防低血糖。

II. 肾脏疾病的评估

1. 尿液分析 尿液检查是体检的重要部分。尿液异常是器质性肾脏疾病的信号。

(1) 血尿 血尿试验阳性提示尿中有游离的血红蛋白或肌红蛋白。肾小球疾病和非肾小球源性血尿的尿中均可见红细胞数量异常增加。血尿可以表现为尿中含大量红细胞(肉眼血尿), 或是只能通过显微镜才能观察到(镜下血尿)。

(2) 蛋白尿 蛋白尿定义为尿蛋白排泄量超过 $150 \text{ mg}/24 \text{ h}$ 或尿白蛋白肌酐比值 (ACR) $\geq 30 \text{ mg/g}$, 但不同的实验室正常值有轻微的偏差。蛋白尿也可能出现在没有肾脏疾病的

production of various hormones, as well as the water-electrolyte balance. Hormones such as renin, angiotensin II (A II), prostaglandins (PGs), endothelin, nitric oxide, adenosine and bradykinin regulate vascular reactivity and renal blood flow. Thirdly, the kidney produces other hormones that influence various end organ functions. Red blood cell production is stimulated by erythropoietin synthesized in renal. Bone metabolism is influenced by renal production of calcitriol, as well as proper balance of calcium and phosphorus. Finally, the kidney participates in gluconeogenesis during fasting to prevent hypoglycemia.

II. Evaluation of renal disease

1. Urinalysis It is an essential part of the physical examination. Urinary abnormality is an index of organic renal disease.

(1) **Haematuria** A positive test of hematuria indicates free haemoglobin or myoglobin in the urine. An abnormal increase of erythrocyte in the urine may either be due to a glomerular disorder or to non-glomerular bleeding. Hematuria may present with lots of blood cells visible to the naked eye (gross hematuria) or visible only by microscopical examination (microscopic hematuria).

(2) **Proteinuria** The proteinuria is defined as urinary protein excretion which is more than 150 mg/24 h or urine albumin to creatinine ratio (ACR) ≥ 30 mg/g, but the normal range may

情况下(如发热、运动和慢性心衰)。体位性(直立位)蛋白尿常发生在青少年中。肾小球性蛋白尿是由于肾小球基底膜的孔径选择特性和电荷选择特性发生改变,使大分子蛋白质和带阴性电荷的白蛋白得以通过。肾小球性蛋白尿主要是由白蛋白构成的。肾小管性蛋白尿可见于急慢性的肾小管间质损伤,每日尿蛋白的排泄量通常 $<2\text{ g}$ 。肾小管性蛋白尿一般来自三个途径。其一,受损的肾小管不能重吸收所有的肾小球滤过的 β_2 微球蛋白等小分子蛋白质。其二,受损的肾小管分泌N-乙酰葡萄糖苷酶等刷状缘成分和细胞酶类入尿。其三,在肾小管间质受损的情况下,髓襻升支的肾小管细胞和终末肾单位向尿中分泌大量Tamm-Horsfall蛋白。溢出性蛋白尿是由于血清中大量的异常小分子量蛋白质被正常肾小球滤过,而又超出正常肾小管的重吸收能力所致。常见于单克隆 γ 球蛋白病(如多发性骨髓瘤)、血管内溶血(血红蛋白尿)和横纹肌溶解(肌红蛋白尿)。

vary slightly from laboratory to laboratory. Proteinuria may also occur in conditions without renal disease (e.g. fever, exercise and chronic cardiac failure). Postural (orthostatic) proteinuria is a condition most commonly seen in adolescents. Glomerular proteinuria is due to changes in the size-selective properties or charge-selective properties of the glomerular basement membrane that allow the passage of largermolecular-weight proteins or negative charged albumin. Glomerular proteinuria is composed predominantly of albumin. Tubular proteinuria is found in both acute and chronic renal tubulo-interstitial injuries. Usually the excretion of urine proteins is less than 2 g per day. Tubular proteinuria is derived from three sources. Firstly, injured tubules fail to completely reabsorb small-molecular-weight proteins filtered by the glomerulus, such as β_2 microglobulin. Secondly, injured tubules secrete brush border components and cellular enzymes, such as N-acetylglucosamine into the urine. Finally, with tubulo-interstitial injury, Tamm-Horsfall protein may be secreted into the urine in greater amounts by the tubular cells of the ascending limb of the loop of Henle and the distal nephrons. Overflow proteinuria is due to the filtration by the normal glomerulus of a large amount of abnormal smallmolecular-weight proteins present in serum whose filtration exceeds the capacity of normal tubules for reabsorption. This occurs in monoclonal gammopathies (such as multiple myeloma), in intravascular hemolysis (hemoglobinuria),

(3) **尿管型** 通常是由髓襻升支及远曲肾小管合成并分泌的Tamm-Horsfall糖蛋白构成。生理管型包括透明管型和颗粒管型,它们可以出现在无肾脏疾病的个体中。在发热、运动和体液消耗的情况下,这些管型的数量会增加。病理管型包括细胞成分(红细胞、白细胞、肾小管细胞、细菌和真菌)、纤维蛋白、脂质、胆汁和结晶。

(4) **白细胞** 尿中白细胞增多往往提示感染,90%的尿路感染患者尿中白细胞增多。无菌性脓尿可见于肾结核、肾乳头坏死、急性间质性肾炎、高尿酸血症肾病、肾小球肾炎和多囊肾。

2. 肾小球滤过率 某一种物质的清除率(C)就是指单位时间内多少血浆中的该物质被清除。临床工作评价肾小球滤过率的方法中,使用最多的是内生肌酐清除率。血清肌酐并不能准确评估肾小球滤过率。为了简便地估算肾小球滤过率,通常使用的是计算公式。这些方程利用血清肌酐浓度、年龄、性别、种族和体重来计算GFR,比单独使用血清肌酐要准确。最常用的两个公式是Cockcroft-Gault公式和MDRD公式,由美国国家肾脏基金会的肾脏病生存质量指导(K/DOQI)推荐。

and in rhabdomyolysis (myoglobinuria).

(3) **Urinary casts** They are formed from Tamm-Horsfall glycoprotein, which is synthesized and secreted by the ascending limb of the loop of Henle and distal convoluted tubules. Physiologic casts include hyaline casts and granular casts which may present in individuals without renal disease. The number of these casts in urine may be increased in conditions of fever, exercise and volume depletion. Pathologic casts contain cellular materials (erythrocytes, leukocytes, tubular cell, bacteria and fungi), fibrin, lipids, bile, and crystals.

(4) **Leukocytes** An increase of the leukocytes in the urine often implies infection. Infected urines show an increase of leukocytes in more than 90% of cases. Sterile pyuria may be seen in tuberculosis, renal papillary necrosis, acute interstitial nephritis, hyperuricemic nephropathy, glomerulonephritis and polycystic kidney.

2. Glomerular filtration rate The clearance(C) of a substance is a measure of the volume of plasma cleared of the substance per unit time. In clinical practice the most widely used measurement of glomerular filtration rate is the clearance of endogenous creatinine. Serum creatinine is not an accurate measure of GFR. To simplify GFR, equations are often used. These formulas make use of serum creatinine concentration, age, gender, race and body size to calculate GFR, which are more accurate than serum creatinine concentration alone. The two most widely used formulas are