CONTRIBUTION OF ACADEMICIAN MOMIR POLENAKOVIC TO THE DEVELOPMENT OF NEPHROLOGY IN THE REPUBLIC OF MACEDONIA

OFFICIAL ADDRESS OF ACADEMICIAN V. SERAFIMOSKI, SECRETARY OF THE DEPARTMENT OF MEDICAL SCIENCES OF THE MACEDONIAN ACADEMY OF SCIENCES AND ARTS ON THE OCCASION OF THE 75TH ANNIVERSARY OF ACADEMICIAN MOMIR POLENAKOVIC

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Abstract
Academician Momir H. Polenakovic, MD, Ph.D. is an outstanding researcher, educator and scientist, one of the founders of the nephrology in the Republic of Macedonia. With more than 500 published papers in national and international journals, of which more than 189 are on the PubMed, he is one of the most fruitful medical worker in our country. With his participation in national and international congresses he has contributed to the transfer of the world nephrology in Macedonia, as well as, to the dissemination of the reputation of the Macedonian nephrology and science in the world. He has educated a number of specialists in internal medicine and subspecialists in nephrology. He has introduced new tests and methods in diagnosis and treatment of renal disease, which was a basis for his research and publication. Analyzing the life opus of Academician Momir Polenakovic we can say that he has dedicated his life and work to the research, diagnosis and treatment of kidney patients.

Key words: Macedonian nephrology, research, diagnosis, treatment of kidney patients

M. Polenakovic is a Professor of Medicine – Nephrology. He is an outstanding researcher, educator and scientist, one of the founders of the nephrology in the Republic of Macedonia. Analyzing the life opus of Academician Momir Polenakovic we can say that he has dedicated his work to the research, diagnosis and treatment of kidney patients. Extremely well
Vladimir Serafimoski

During his study at the Medical Faculty of the University of Ss. Cyril and Methodius in Skopje he has shown interest in research and he has been educated and supported by the best professors of the Faculty, as Acad. I. Tadger, Acad. D. Arsov, Prof. V. Dolgova, Prof. D. Hrisoho, Prof. D. Miovski and Prof. B. Karkanfilski. Under their guidance he participated in the research and has prepared several papers published in the student journals of former Yugoslavia (see the bibliography of Acad. Momir Polenakovic http://manu.edu.mk/prilozi/editor.htm).

In the early 1960s, with his Prof. Hrisoho he described the new region with the Balkan Endemic Nephropathy (BEN), along the upper part of South Morava River in the village of Vitina, Kosovo, Serbia. The clinico-morphological examination of BEN became a life occupation of Prof. Polenakovic. He has published several papers about BEN and one chapter published in the Oxford Textbook of Nephrology, 1992.

Fig. 1 – The paper about the Endemic Nephropathy in the village of Vitina (Kosmet) was awarded the first prize at the IV Congress of students of medicine held in Sarajevo from 5 to 8 July 1962. The paper has been published
6.7 Balkan nephropathy

Balkan nephropathy is a familial chronic tubulointerstitial disease, encountered in some restricted areas of Yugoslavia, Bulgaria, and Romania. The first description of the disease in Yugoslavia was made by Došilović et al. (1957) and in Bulgaria by Tanev et al. (1956). The earliest observation of an increased incidence of renal disease in some of the present endemic settlements was made by practicing physicians in about 1941 and 1942.

Geographical distribution
Balkan nephropathy is geographically located in the areas of south-eastern Europe, along the tributaries of the Danube (Fig. 1), within an area of about 100 to 500 km². The endemic areas in Yugoslavia, Bulgaria, and Romania border on one another and the distance between them is not more than 100 km. The disease is limited to a relatively small region north and south of the Danubian Iron Gates and located in a few areas along the tributaries of this river in the plains and low hills at an altitude of 150 to 500 m above sea level, some distance from the mountainous regions of the Balkan and Carpathian. The region where Balkan nephropathy is detected generally have high humidity and high rainfall. No local geological peculiarities have been described.

Balkan Nephropathy

Kidney Disease beyond the Balkans?

Vladimir Stefanović and Momir H. Polenaković

Abstract

Balkan endemic nephropathy (BEN) is a familial chronic urinary tract disease with a three-stage progression from asymptomatic Balkan endemic nephropathy (BEN) to chronic kidney disease. The disease is characterised by the presence of multiple kidney stones, a high incidence of upper tract tumours, and a chronic inflammatory process in the renal cortex. The disease is more common in people with a genetic predisposition and is caused by exposure to BEN. In areas where BEN is endemic, the incidence of upper tract tumours is significantly higher, even in children. Several hypotheses have been advanced about the etiology of BEN. One of the most prominent hypotheses is the existence of a virus or a parasitic infection. The disease has been associated with factors such as diet, nutrition, and water quality. The complex pathogenesis of BEN is still not fully understood, and further research is needed to elucidate the underlying mechanisms.

Key words: Balkan endemic nephropathy, upper tract tumours, renal cortex.
Balkan nephropathy

With his colleagues he introduced the treatment of Acute (1965) and Chronic (1971) Kidney Failure with hemodialysis. He has published a number of papers about renal disease in national and international journals. He has a special interest in investigation of cupropharm membrane and PMMA in patients on hemodialysis. He participated in the first renal transplantation in the Republic of Macedonia in 1977.


Fig. 7 – Arov D., Hrisoho D, Guceva B., Gucev S, Polenakovic M. Treatment of Patients with Acute Renal Insufficiency with Special Reference to our Experience with Haemodialysis. Macedonian Medical Review 1971; XXVI(1–2): 3–14

Fig. 8 – Masin G, Polenaković M, Ivanovski N, Atanasov N, Stoščeva O, Čakalarovski K. Hypersensitivity Reactions to Ethylene Oxide: Clinical Experience. Nephrology Dialysis Transplantation. 1991; 6(Suppl. 3): 50–2
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Guest Editors:
Momir Polenakovic
Jorg Valentin
The International Journal of Artificial Organs
Dialysis in adults in year 2000 in the Republic of Macedonia

Fig. 11 – Polenaković MH on behalf of the Dialysis Working Group. Dialysis in adults in year 2000 in the Republic of Macedonia. The International Journal of Artificial Organs. 2002; 25(5): 386–90

Fig. 12 – Polenakovic M. Erythropoietin in treatment of renal anemia Nefrologija 2000, Macedonian Medical Review. 2001; 55 (suppl. 49): 255–6
He introduced the treatment with erythropoetin (EPO) in patients with anemia and chronic renal disease, as well as on hemodialysis. His publications about the survival of red blood cells and EPO and heart morphology before and after treatment with EPO are well known.

Analysis of Heart Morphology and Function Following Erythropoietin Treatment of Anemic Dialysis Patients

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Fig. 13 – Sikole A, Polenakovic M, Spirovskaja V, Polenakovic B, Masin G. Analysis of Heart Morphology and Function Following Erythropoietin Treatment of Anemic Dialysis Patients. Artificial Organ. 1993; 17(12): 977–84


In the beginning of 1970s, he introduced the percutaneous renal biopsy and the examination of the received renal tissue with light, fluorescent and electronic microscopy, among the first in former Yugoslavia. That way, he performed the classification of primary and secondary glomerulonephritis. Thanks to these methods the treatment of glomerulonephritis improved with the most advanced therapy, with immunosuppressive therapy and plasmapheresis.
Having in mind his experience in research of glomerulonephritis he was invited by the editors of the Medical Encyclopedia from Zagreb, Croatia to write a chapter about Membranous nephropathy and IgA nephropathy in the Medicinska enciklopedija (Jugoslavenski leksikografski zavod, Zagreb, Medical Encyclopedia).

Fig. 16 – Medicinska enciklopedija
Fig. 17 – Polenaković M. Membranous Glomerulonephritis. Medicinska enciklopedija, Drugi dopunski svezak, Zagreb, Jugoslovenski Leksikografski zavod "Miroslav Krleža", MCMLXXXVI: 416–8

Fig. 18 – Polenaković M. IgA Nephropathy. Medicinska enciklopedija, Drugi dopunski svezak, Zagreb, Jugoslovenski leksikografski zavod "Miroslav Krleža", MCMLXXXVI: 418–9
Unilateral Renal Vein Occlusion in Rats

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Keywords: Renal vein - Thrombosis - Occlusion - Rats - Experimental electron microscopic immunofluorescent

Abstract. To study the relationship of renal vein thrombosis to membranous glomerulonephritis with the nephrotic syndrome, we attempted to simulate the former by occluding a 0.5 mm renal vein in rats. Although increased proteinuria did occur during the first 10 days after such occlusion, there was little difference from control animals in the amount of proteinuria thereafter, up to 46 days, and no evidence of membranous glomerulonephritis by light, immunofluorescent, or electron microscopy.

Fig. 19 – Polenaković M, Ganote ChE, Potter EV, Jennings RB. Unilateral Renal Vein Occlusion in Rats. Nephron. 1985; 40: 91–5

Fig. 20 – Grcevska L, Polenakovic M. Collapsing Glomerulopathy: Clinical Characteristics and Follow-up. American Journal of Kidney Disease. 1999; 33(4): 652–7
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Tubular basement membrane changes during induction and regression of drug-induced polycystic kidney disease

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Tubular basement membrane changes during induction and regression of drug-induced polycystic kidney disease. Defective cell extracellular matrix (ECM) homeostasis is considered a factor in the development of polycystic kidney disease (PKD). Alterations in the expression of various ECM components may lead to tubular dysmorphogenesis and uncontrolled tubular cystic expansion. In this study, expression of certain ECM components was investigated in a diphencyclopropen (DPP)-induced model of PKD. DPP induces cystic changes in the collecting tubules, most severe in the outer medulla and inner cortex, and following withdrawal of DPP, cystic tubules return to normal with persistence of small interstitial fibrosis. SDS-PAGE analysis of isolated adult basement membranes (TBM) of control and PKD kidneys revealed overall similar electrophoretic migration bands. However, in PKD, there were relative increases in components M, 305,000, 260,000, and 145,000, and a decrease in and have decreased synthesis and expression of proteoglycans (PG), and altered immunoreactivities for other ECM glycoproteins, for example, fibronectin (FN) and type-I collagen have been noted in human forms of PKD. In a previous study [5], biochemical changes in non-collagenous glycoproteins in TBM of kidneys with diphenylpropen (DPP)-induced PKD were observed, and these alterations suggested with the discontinuation of DPP. Besides the changes in various matrix components, impaired intracellular synthesis and processing of sulfated glycoproteins (SGPs) in the Golgi complex was observed [11]. The SGPs synthesized were undersulfated, and consequently, this led to their

Fig. 22 – Carone AF, Butkowski RJ, Nakamura S, Polenaković M, Kanwar YS. Tubular Basement Membrane Changes During Induction and Regression of Drug-induced Polycystic Kidney Disease. Kidney International. 1994; 46(5): 1368–74
The incidence of biopsy-proven primary glomerulonephritis in the Republic of Macedonia—long-term follow-up

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Abstract

In order to define the type of renal disease, renal biopsy was performed in 1304 patients aged 14–72 years. Their biopsies were processed for light and immunofluorescence microscopy, and electron microscopy in some cases. The diagnosis of primary glomerular disease was confirmed in 716 patients with the following incidence: minimal change nephrotic syndrome in 127 (17.5%), focal segmental glomerulosclerosis in 72 (9.9%), membranous nephropathy in 97 (13.5%), IgA nephropathy in 85 (11.9%), diffuse mesangial glomerulonephritis (GN) without IgA in 32 (4.4%), focal mesangial GN in 97 (13.5%), mesangoproliferative GN in 39 (5.4%), acute GN in 88 (12.5%), crescentic GN in 55 (7.4%) and sclerosis GN in 46 patients (6.4%).

Subjects and methods

This is a single-centre retrospective study. Renal biopsy specimens of adult patients with primary GN were selected from 1304 consecutive renal biopsies performed at the Department of Nephrology, Skopje, Macedonia over a period of 26 years (1975–2001). All the biopsies were evaluated by light microscopy and immunofluorescence, using standard procedures. Electron microscopy was only available during 1986–1983 and 1995–1996. Cribb (WHO) classification was performed after exclusion of systemic diseases or underlying abnormalities [8].

Results


In the last years, Acad. Momir Polenakovic as Head of the Research Center for Genetic Engineering and Biotechnology at the Macedonian Academy of Sciences and Arts is mainly involved in the genetic and proteomic investigation of HCV and prostate cancer.

Fig. 24 – Katarina Davaljeva, Momir Polenakovic. Proteomics in diagnosis of prostate cancer. Prilozi: XXXVI 1, 2015
Contribution of academician Momir Polenakovic…

Prof. Polenakovic has published several books, alone, and with his colleagues.


Fig. 26 – Momir Polenakovic Nutrition in patients with renal insufficiency and dialysis therapy. Skopje: EIN-SOF, Macedonian society of nephrology, dialysis, transplantation and artificial organs; 1997: 186

Fig. 28 – Nikodijevic B., Dzonov M., Bogoev M., Tadzer I., Andreevski A., Polenakovic M., Savevski J., Editors. Contemporary diagnostic and therapy in medicine – 2000, 2000: 2268
Fig. 29 – Internal Medicine

Fig. 30 – Internal Propedeutics
He is an Editor in chief of the Journal Prilozi of the Macedonian Academy of Sciences and Arts; Associate editor of BANTAO Journal; Member of the Advisory Board of Actual Nephrology: Kidney Foundation, Varna – Bulgaria; Aktuality v nefrologii (Current concepts in nephrology), Czech Republic; Former Member of the Advisory Board of: Nephrology, Dialysis, Transplantation (NDT), and JAMA (Journal of American Medical Association) – Yugoslav Edition.

He has established international scientific joint collaborations: Department of Nephrology, Rostock-Germany; Department of Nephrology, Antwerpen-Belgium; Department of Nephrology, Freie Universitaet – Berlin; Departments of Medicine, Nephrology and Infectious Disease – Northwestern University Chicago and Wright State University – Dayton, USA; the International Centre for Genetic Engineering and Biotechnology, Trieste, Italy and the Department of Psychiatry, Columbia University Medical Center, New York, USA.

He was the principal investigator in several national and international projects.

We have partially presented the scientific work of Acad. Polenakovic. Having in mind that he has published more than 500 papers, of which more than 189 papers are on the PubMed, several hundred abstracts, several books and book chapters we can say that he is really a Nestor of the Macedonian nephrology and one of the most active and distinguished medical workers in the Republic of Macedonia.

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Резиме

ПРИДОНОСТ НА АКАДЕМИК МОМИР ПОЛЕНАКОВИЋ ЗА РАЗВОЈОТ НА НЕФРОЛОГИЈАТА ВО РЕПУБЛИКА МАКЕДОНИЈА

ОФИЦИЈАЛНО ОБРАЌАЊЕ НА АКАДЕМИК ВЛАДИМИР СЕРАФИМОВСКИ, СЕКРЕТАР НА ОДДЕЛЕНИЕТО ЗА МЕДИЦИНСКИ НАУКИ НА МАКЕДОНСКАТА АКАДЕМИЈА НА НАУКИТЕ И УМЕТНОСТИТЕ, ПО ПОВОД 75 ГОДИНИ ОД РАЃАЊЕТО НА АКАДЕМИК МОМИР ПОЛЕНАКОВИЋ

Владимир Серафимоски
Македонска академија на науките и уметностите

Академик Момир Х. Поленаковиќ е познат истражувач, едукатор и научник, еден од основачите на нефрологијата во Република Македонија. Со повеќе од 500 објавени трудови во домашни и меѓународни списанија, од кои повеќе од 180 се на PubMed, тој е еден од најплодните медицински работници во нефрологијата. Со своето учество на национални и меѓународни конгреси, академик Поленаковиќ придонесе за трансфер на светската нефрологија во Македонија, како и за шириње на угледот на македонската нефрологија и наука во светот.

Тој им обр зов на голем број специјалисти по интерн медицин и супспецијалисти по нефрологија. Кем бил олен ковик воведе нови тестови и методи за гнози, наученици, јави и испрашаничќи од основи на нефрологијата во епоку кедонија. О певе од 500 објени трудови во домашни и во меѓународни списанија, од кои по-

Ключни зборови: Македонска нефрологија, истражување, дијагностика, третман на бубрежни болести