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Editorials

1669 **Lower Physical Activity and Depression Are Associated with Hospitalization and Shorter Survival in CKD**
Denise Mafra and Denis Fouque
See related article on page 1737, 1713, 1702.

1671 **What Drives Early Dialysis Initiation and How Do We Optimize Timing of RRT?**
Yelena Slinin and Areef Ishani
See related article on page 1747.

1674 **Might the Current Gauge of Transplant Center Quality Result in Reducing Patient Access *via* Diminished Organ Utilization?**
Swee-Ling Levea and Anthony Langone
See related article on page 1773.

Original Articles

Chronic Kidney Disease

1676 **Effect of Omega-3 Fatty Acids on Kidney Function after Myocardial Infarction: The Alpha Omega Trial**
Ellen K. Hoogeveen, Johanna M. Geleijnse, Daan Kromhout, Theo Stijnen, Eugenie F. Gemen, Ron Kusters, and Erik J. Giltay

Clinical Nephrology

1684 **The New Histopathologic Classification of ANCA-Associated GN and Its Association with Renal Outcomes in Childhood**
Damien G. Noone, Marinka Twilt, Wesley N. Hayes, Paul S. Thorner, Susanne Benseler, Ronald M Laxer, Rulan S. Parekh, and Diane Hebert

Epidemiology and Outcomes

1692 **Familial Clustering of ESRD in the Norwegian Population**
Rannveig Skrunes, Einar Svarstad, Anna Varberg Reisæter, and Bjørn Egil Vikse

1702 **Associations of Self-Reported Physical Activity Types and Levels with Quality of Life, Depression Symptoms, and Mortality in Hemodialysis Patients: The DOPPS**
Antonio Alberto Lopes, Brett Lantz, Hal Morgenstern, Mia Wang, Brian A. Bieber, Brenda W. Gillespie, Yun Li, Patricia Painter, Stefan H. Jacobson, Hugh C. Rayner, Donna L. Mapes, Raymond C. Vanholder, Takeshi Hasegawa, Bruce M. Robinson, and Ronald L. Pisoni
See related editorial on page 1669.

ESRD and Chronic Dialysis

1713 **Depressive Affect and Hospitalization Risk in Incident Hemodialysis Patients**
Eduardo Lacson Jr., Lisa Bruce, Nien-Chen Li, Ann Mooney, and Franklin W. Maddux
See related editorial on page 1669.

1720 **Comparative Associations of Muscle Mass and Muscle Strength with Mortality in Dialysis Patients**
Naohito Isoyama, Abdul Rashid Qureshi, Carla Maria Avesani, Bengt Lindholm, Peter Bàràny, Olof Heimbürger, Tommy Cederholm, Peter Stenvinkel, and Juan Jesús Carrero

Original Articles (Continued)

Genetics

1729 **Transcriptional Complexity in Autosomal Recessive Polycystic Kidney Disease**
Valeska Frank, Klaus Zerres, and Carsten Bergmann

Geriatric Nephrology

1737 **Nondisease-Specific Problems and All-Cause Mortality among Older Adults with CKD: The REGARDS Study**
C. Barrett Bowling, John N. Booth lll, Orlando M. Gutiérrez, Manjula Kurella Tamura, Lei Huang, Meredith Kilgore, Suzanne Judd, David G. Warnock, William M. McClellan, Richard M. Allman, and Paul Muntner
See related editorial on page 1669.

Health Services Research

1747 **Variation in the Level of eGFR at Dialysis Initiation across Dialysis Facilities and Geographic Regions**
Manish M. Sood, Braden Manns, Allison Dart, Brett Hiebert, Joanne Kappel, Paul Komenda, Anita Molzahn, David Naimark, Sharon Nessim, Claudio Rigatto, Steven Soroka, Michael Zappitelli, and Navdeep Tangri on behalf of the Canadian Kidney Knowledge Translation and Generation Network (CANN-NET)
See related editorial on page 1671.

Nephrolithiasis

1757 **Distinguishing Characteristics of Idiopathic Calcium Oxalate Kidney Stone Formers with Low Amounts of Randall's Plaque**
Xiangling Wang, Amy E. Krambeck, James C. Williams, Jr., Xiaojing Tang, Andrew D. Rule, Fang Zhao, Eric Bergstralh, Zejfa Haskic, Samuel Edeh, David R. Holmes lll, Loren P. Herrera Hernandez, and John C. Lieske

Renal Transplantation

1764 **Sex Differences and Attitudes toward Living Donor Kidney Transplantation among Urban Black Patients on Hemodialysis**
Avrum Gillespie, Heather Hammer, Stanislav Kolenikov, Athanasia Polychronopoulou, Vladimir Ouzienko, Zoran Obradovic, Megan A. Urbanski, Teri Browne, and Patricio Silva

1773 **Association between Kidney Transplant Center Performance and the Survival Benefit of Transplantation Versus Dialysis**
Jesse D. Schold, Laura D. Buccini, David A. Goldfarb, Stuart M. Flechner, Emilio D. Poggio, and Ashwini R. Sehgal
See related editorial on page 1674.

Renal Physiology

1781 **Urine-Concentrating Mechanism in the Inner Medulla: Function of the Thin Limbs of the Loops of Henle**
William H. Dantzler, Anita T. Layton, Harold E. Layton, and Thomas L. Pannabecker

Attending Rounds

1790 **A Patient with Heart Failure and Worsening Kidney Function**
Mark J. Sarnak

Special Features

1799 **Filling the Holes in Cystic Kidney Disease Research**
Lisa M. Guay-Woodford, Elizabeth Henske, Peter Igarashi, Ronald D. Perrone, Berenice Reed-Gitomer, Stefan Somlo, Vicente E. Torres, Christian J. Ketchum, Robert A. Star, Michael F. Flessner, and Rebekah S. Rasooly

1802 **The Last Mile: Translational Research to Improve CKD Outcomes**
Delphine S. Tuot, Clarissa Jonas Diamantidis, Cynthia F. Corbett, L. Ebony Boulware, Chester H. Fox, Donna H. Harwood, Robert A. Star, Krystyna E. Rys-Sikora, and Andrew Narva

Special Features (Continued)

1806 **The Kidney Research National Dialogue: Gearing Up to Move Forward**
Joseph V. Bonventre, L. Ebony Boulware, Laura M. Dember, Barry I. Freedman, Susan L. Furth, Lawrence B. Holzman, Christian J. Ketchum, Melissa H. Little, Rajnish Mehrotra, Sharon M. Moe, Jeff M. Sands, John R. Sedor, Stefan Somlo, Robert A. Star, and Krystyna E. Rys-Sikora on behalf of the Kidney Research National Dialogue (KRND)

1813 **Setting Research Priorities for Patients on or Nearing Dialysis**
Braden Manns, Brenda Hemmelgarn, Erin Lillie, Sally Crowe P.G. Dip, Annette Cyr, Michael Gladish, Claire Large, Howard Silverman, Brenda Toth, Wim Wolfs, and Andreas Laupacis

Erratum

1822 **Correction**

eJournal club provides a timely and interactive electronic journal club experience by offering a forum in which CJASN readers have the opportunity to converse with the featured study authors. Visit ejc.cjasn.org to learn more.

On the Cover

What's the diagnosis? A 65-year-old woman with a history of hypertension, CAD, left renal artery stenosis, GERD, autoimmune hepatitis, and hypothyroidism developed acute kidney injury following unremarkable transvaginal hysterectomy, bilateral oophorectomy and pelvic floor reconstruction. Oliguria and rising serum creatinine developed 48 hours in the post-operative course and continued despite intravenous fluids. Exam was notable for basilar lung crackles, no rash or edema was present. Non-contrast CT scan revealed mild pelvocaliectasis and moderate left kidney atrophy. Ureteroscopy excluded obstruction and kidney function continued to decline with serum creatinine increasing to 4.6 mg/dl (baseline 0.9 mg/dl). Urine microscopy revealed numerous WBCs, RBCs, waxy casts, and both WBC and renal tubular epithelial cell casts. Laboratory data revealed increased LDH (673 U/L), and depressed haptoglobin (<10 mg/dl) and serum complement (C3 58 mg/dl and C4<10 mg/dl). Urine spot protein:creatinine ratio was 13.1. CBC revealed anemia and thrombocytopenia, but no schistocytes or spherocytes on peripheral blood smear. Kidney biopsy was performed. In the left upper panel, light microscopy reveals a glomerulus with intracapillary thrombi and segmental capillary hypercellularity with necrosis. The right upper panel demonstrates positive IgM staining of the intracapillary thrombi and of the deposits along the subendothelial space by immunohistochemistry, The left lower panel reveals large intracapillary thrombi and subendothelial deposits by electron microscopy. The right lower panel shows higher magnification of one of the intracapillary thrombi showing its organized substructure. These findings are consistent with cryoglobulinemic glomerulonephritis. Work-up revealed type-1 cryoglobulinemia with monoclonal IgM kappa.

Cryoglobulins are immunoglobulins that precipitate in the cold. Cryoglobulinemia consists of 3 types based on the immunoglobulin (Ig) components. Type I is comprised of a single monoclonal Ig, type II with a polyclonal and monoclonal Ig, and type III with 2 polyclonal Ig. Type I is primarily seen in monoclonal diseases like multiple myeloma or Waldenstrom's macroglobulinemia, type II is caused by viral infections, with hepatitis C the most common, and type III is often associated with chronic inflammatory and autoimmune diseases. Renal manifestations include hematuria with low-grade or nephrotic range proteinuria, acute or chronic kidney injury, and hypertension. Other manifestations include purpura, arthralgias/arthritis, and peripheral neuropathy. Kidney biopsy may show a membranoproliferative pattern. However, as seen in our case, intraluminal thrombi composed of precipitated cryoglobulins, IgM positivity in thrombi and deposits, and "curvilinear" substructure of deposits and thrombi seen by electron microscopy are the diagnostic hallmark of lesions of cryoglobulinemic GN. We believe that hypothermia associated with the operative procedure initiated the cold-induced cryoglobulin precipitation and chain of events. (Images and text provided by Gilbert Moeckel, MD and Mark A. Perazella, MD, Yale University School of Medicine, New Haven, CT)