Numerous studies have shown that maternal health and the uterine environment may affect certain aspects of an offspring’s well-being. Kidney health appears to be no exception. Low birth weight and maternal conditions such as diabetes and overweight/obesity were linked with an increased risk of developing chronic kidney disease (CKD) in children, reports a study in the Journal of the American Society of Nephrology. Additional research may help determine whether modifying these factors could help protect children’s kidney health.

“Data suggest that CKD is on the rise in both children and adults and in the absence of any available cures for CKD, identifying potentially modifiable risk factors may underscore novel targets in order to reduce or even prevent CKD,” said lead author Christine Hsu, MD, of the University of Washington in Seattle.

Risk factors at play
Because some risk factors that contribute to the development of CKD may be programmed prenatally, Hsu and her colleagues looked for an association of childhood CKD with various prenatal risk factors. They studied nearly 2000 patients with childhood CKD and more than 20,000 controls without the disease. They linked maternal and infant characteristics in Washington state birth records from 1987 to 2008 to hospital discharge data, and they assessed factors including birth weight, maternal diabetes, and maternal overweight/obesity. The Washington state birth record linkage enabled the investigators to conduct the largest study to date of potential prenatal determinants of CKD.

The prevalence of CKD in Washington state was 126.7 cases per 100,000 births, based on a CKD definition that included renal dysplasia/aplasia and obstructive uropathy according to International Classification of Diseases, version 9 (ICD-9) coding at hospital discharge. Infants with low birth weight were nearly three times more likely to develop childhood CKD than infants with normal birth weight, after adjustments were made for potential confounding factors.

Certain Prenatal Risk Factors Linked with Increased Kidney Disease Risk for Children

Latest “Doc Fix” Legislation Contains New Provisions for Medicare ESRD Program

The "doc fix" — or Protecting Access to Medicare Act of 2014— that President Obama signed into law in April narrowly averted a 24 percent reduction in Medicare physician payments that was about to go into effect. It was the 17th time Congress enacted legislation to bypass mandated cuts to reimbursements calculated by the sustainable growth rate (SGR) formula. In addition to preventing physician payment cuts, this year’s SGR patch law includes provisions that affect all health care providers, and in particular members of the kidney community.

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The first ESRD provision delays again the inclusion of oral-only medications into the ESRD PPS, or bundles for treating Medicare patients. These laws “patch” required payment decreases calculated by the sustainable growth rate (SGR) formula. In addition to preventing physician payment cuts, this year’s SGR patch law includes provisions that affect all health care providers, and in particular members of the kidney community.

Of main interest to the kidney care team are four revisions to the Medicare End-Stage Renal Disease (ESRD) Prospective Payment System (PPS). Outlined in Section 217 of the bill, the new ESRD provisions range in scope from changes to the ESRD bundled payment rate to mandated cost report auditing for dialysis providers.

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Infants also had a 54 percent increased odds of developing CKD if their mothers developed diabetes during pregnancy, a 24 percent increased odds if their mothers were overweight, and a 26 percent increased odds if their mothers were obese.

In a subgroup analysis by CKD subtype, low birth weight and maternal pregestational diabetes were linked significantly with increased risk of renal dysplasia/aplasia, while low birth weight, maternal gestational diabetes, and maternal BMI were also linked significantly with obstructive uropathy.

While the mechanisms by which various prenatal factors may affect CKD risk were not assessed in this study, other research suggests that maternal diabetes may adversely compromise fetal renal programming, resulting in abnormal kidney development. Hsu and colleagues noted that obesity has also been linked with malformations of the urogenital system, although the data are conflicting and the mechanism that might be involved may be independent of those involving maternal diabetes. For example, obese women may be at increased risk of metabolic conditions such as hyperglycemia or hyperinsulinemia independent of the presence of diabetes, and these may affect developmental risk in offspring.

Attemping to reduce risk
The study's findings will likely serve as a starting ground for future investigations on ways to target CKD at the earliest stages in life.

"We hope this research leads to further research on ways to reduce kidney disease through either early treatment or prevention that might begin even before birth," Hsu said. "Previous studies show that strict control of maternal diabetes significantly reduces the risk of congenital malformations in children. We hope our work leads to future studies to investigate whether strict control of maternal diabetes and/or reducing maternal obesity/ overweight reduces childhood CKD.

The serious nature of CKD in children has led to various multicenter research efforts within the pediatric nephrology community, including the Chronic Kidney Disease in Children (CKiD) study in North America and the Effect of Strict Blood Pressure Control and ACE Inhibitor on the Progression of Chronic Renal Failure in Pediatric Patients (ESCAPE) trial in Europe, noted Bradley Warady, MD, who was not involved with the research. Warady is senior associate chair for the department of pediatrics at Children's Mercy Hospitals and Clinics and a professor of pediatrics at the University of Missouri-Kansas City School of Medicine. These studies were designed to delineate risk factors for CKD progression in affected patients.

The work by Hsu and colleagues nicely complements those initiatives by providing unique insights into the development of two of the most common causes of CKD in childhood, with the goal of abstracting multiple and most importantly, potentially modifiable prenatal risk factors," Warady said. "Replication of these data in additional patient cohorts would provide strong support for the aggressive management of these factors with the hope of actually being able to decrease the incidence of this chronic disorder."

Study co-authors include Kalani Yamamoto, MD, Rohan Henry, MD, Anneclare De Roos, PhD, and Joseph Flynn, MD.

Disclosures: The authors reported no financial disclosures.

The article, entitled "Prenatal Risk Factors for Childhood CKD," is available online at http://jasn.asnjournals.org.

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dled payment. Previously scheduled for January 1, 2016, the date for adding oral medications without equivalent IV preparations into the bundle has now been pushed back 8 years to January 1, 2024. The Health and Human Services (HHS) secretary is also required to develop a process by 2016 that determines when a drug is no longer considered an oral-only medication, and for inclusion of new injectable and IV medications into the bundle.

Another provision directs the HHS Secretary to specify new quality measures for conditions treated by oral-only medications for the ESRD Quality Incentive Program (QIP).

The new legislation’s most significant change is delineated in the third ESRD provision, which redefines requirements for adjusting the bundled payment rate. Specifically, it revises cuts to dialysis providers introduced last year by the Centers for Medicare & Medicaid Services (CMS). The law addresses the final rule issued by CMS that called for a 12 percent decrease to the ESRD PPS spread out over 4 years.

"CMS was required by the American Taxpayer Relief Act (ATRA) to lower the bundled payment to account for lower drug utilization," explained Marc Chow, Executive Director of the National Renal Administrators Association. The ATRA reduction was based on the decrease in drug and biologic use observed between 2007 and 2012.

The SGR legislation replaced sections of last year’s Medicare ESRD payment rule that implemented the congressionally mandated rebasing of the ESRD payment bundle due to lower drug use, said Chow. Instead of the planned reimbursement cuts of up to $30 per dialysis treatment, Congress replaced the ATRA bundled payment decrease with a 1.25 percent cut in 2016 and 2017, and a 1 percent decrease in 2018.

The fourth ESRD provision implements auditing of Medicare cost reports of service providers and dialysis facilities. The legislation directs the HHS secretary to audit a random sample of ESRD cost reports beginning with those from 2012.

The SGR patch also addresses the effects of the budget sequester, which required Medicare provider payments, Chow said.

"Under current law, the Bipartisan Budget Act of 2013’s adjusted budget sequester for 2024 by requiring a cut of 2.9 percent for the first 6 months of the year and a cut of 1.11 percent for the second 6 months of the year," Chow said. "The SGR bill further adjusts budget sequester for 2024 by requiring a 4 percent cut for the first 6 months of the year and lowering the cut to 0 percent in the second 6 months."

"On the legislative front, overall the provisions restore some certainty to the payment system," LeAnne Zamwali, Group Vice President at DaVita told ASN Kidney News. "However, the fact remains that Medicare reimbursement is below the cost to deliver care for most patients. Providers rely on the cross-subsidization from the private sector and this is not sustainable for patients or providers. Without cross-subsidization, many geographic areas may ultimately be underserved."

A sustained attempt to fix the SGR
Congress developed the SGR as a mechanism to control Medicare spending on physician fees. The 1997 formula ties Medicare spending to economic growth rates. If Medicare expenditures exceed the SGR target growth, automatic physician payment reductions are triggered. Since its passage, Congress has avoided implementing the required cuts or replacing the legislation with a more sound approach to cost containment, relying instead on passing temporary patches.

ASN, along with the American College of Physicians, the American Medical Association (AMA) and numerous other medical societies, have called for the repeal and replacement of the SGR with a more stable, predictable system. The odds of successfully repealing and replacing the SGR were, until recently, slim because of its large price tag. However, a revised cost estimate from the Congressional Budget Office—reducing the proposed expense of replacing the current system from $245 billion to $138 billion—spurred lawmakers to craft SGR repeal bills in both the House and Senate.

The proposed bill included physician pay increases over 10 years and a pay-for-performance incentive. Although this bipartisan attempt to eliminate the SGR advanced through congressional committees, it foanded over disagreement on how to pay for the costs of replacing the latest patch. Despite calls by lawmakers on both sides of the aisle for SGR repeal, a viable permanent solution remains elusive, leaving an uncertain future for Medicare physician reimbursemens.

ICD-10 implementation delayed again
In addition to patching the SGR, the law delayed implementation of ICD-10 coding for reporting diagnoses and procedures. Already postponed several times before, the latest deferment came less than 2 months after Centers for Medicare & Medicaid Services Commissioner Marilyn Tavenner stated that ICD-10 would be implemented on October 1, 2014. The law pushes this back to October 1, 2015, and it remains unclear if this is the last of the delays.

Introduced in 1990 by the World Health Organization, the ICD-10 (International Classification of Diseases, 10th revision) diagnostic and procedural codes are already in wide use around the world. Designed to provide more detail about physician encounters, ICD-9’s replacement is broader and more detailed, containing 68,000 codes.

The granularity of the new coding system has garnered attention for such individual codes as being bitten by an orca, walking into a lamp post, or being sucked into a jet engine. Yet ICD-10 incorporates coding for laterality and will capture more specific and detailed data for health researchers than currently available through ICD-9.

The change to ICD-10 coding has long been resisted by several organizations, including the AMA. According to its own research, costs of ICD-10 implementation range from $56,000 for small practices to as much $8 million for large practices. This includes expenses for training, software, and testing. The organization indicated that specialty physician practices would incur the highest cost.

Reaction to the delay has been divided. Some welcomed it, noting the delay will give providers more time to prepare and could reduce the potential for chaos and financial disruption as the new codes are introduced to providers and payers. However, those organizations that have invested heavily in ICD-10 preparations and infrastructure, such as insurers and hospitals, have had to quickly develop contingency plans, and health information technology companies have also experienced a decline in business due to the delayed implementation.