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## World kidney day 2018; chronic kidney disease and women, the long way we have come

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World kidney day is a global health campaign focused on raising awareness of kidney diseases, their prevalence and associated burdens in the world and planning to improve them. Each year, world kidney day is held on second Thursday of March, which has coincided with 8th of March, the international day of women. As a result, on the 13th anniversary of this campaign, kidney diseases in women will be the center of attention, with a special focus on chronic kidney disease (CKD).

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Chronic kidney disease (CKD) is traditionally associated with a poor obstetric outcome(1). As CKD affects around 4% of women in childbearing age, considerable attention is shifted toward its management (2). A little more than 40 years ago, an anonymous editorial published in the Lancet stated; “children of women with renal disease used to be born dangerously or not at all—not at all, if their doctors had their way”(3). Most physicians considered any disruption of kidney function opposed to an uneventful and successful pregnancy and recommended early termination. This overcautious approach resulted from reports of high rates of miscarriages in women with CKD at the time. Overall, only two-thirds of fetuses survived and the situation was far worse for pregnant women with advanced CKD (4). Stages of CKD were not well-defined then and physicians used the same approach for every woman with any level of CKD. During the past 40 years, the situation has improved remarkably (5). The fetal survival rate is increased considerably (to more than 90% in some reports), even in pregnant women on hemodialysis. How was this success achieved? Although general developments in obstetric medicine (e.g. administration of folic acid and

iron supplements) contributed the most to increased fetal survival rates, they are not the only factors. Increased understanding of CKD and renal physiology during pregnancy contributed significantly as well (5).

Pregnant women experience prominent changes in the physiology of kidney function. Of note, production of renal hormones (renin, erythropoietin and active vitamin D) and glomerular filtration rate (GFR) increase considerably (6). The extent of adaptation to these changes is dependent on normal kidney function. If the kidneys fail to comply with new physiologic demands, the need for the increased functionality will strain the kidneys furthermore. As a result, kidney function will deteriorate more rapidly with higher stages of CKD. Consequently, the increased hormone production and GFR can be maintained to some levels in pregnant women with mild and moderate kidney disease, resulting in mostly uneventful pregnancies. Unfortunately, this is not the case in more severe cases. Kidneys fail to respond adequately to increased demands and their function will deteriorate and prevalence of poor obstetric outcomes is increased significantly (2).

During pregnancy, pyelonephritis and hypertensive disorders are often observed with CKD (7). Each of these

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conditions reduce the chance of a successful pregnancy. Hypertensive disorders, most notably pre-eclampsia, remain the most prominent predictor of pregnancy outcome in women with CKD (8). Despite difficulties in a precise definition of the condition, it is clear that the incidence of pre-eclampsia correlates with the severity of CKD. Superimposed pre-eclampsia in pregnant women with CKD can reduce fetal survival rates up to 50% (4). Chronic pyelonephritis is another common condition happening with CKD in pregnant women. Chronic pyelonephritis is more prevalent in women in comparison to men generally and the risk is increased during pregnancy (9). Although easily managed, if left unchecked, chronic pyelonephritis increases the risk of pregnancy. Hence, CKD can directly affect pregnancy outcomes. Other coexisting conditions should be considered when a pregnant woman with CKD prepares for pregnancy. Managing each of these conditions, usually covered in pre-pregnancy counseling for high-risk women, in addition to CKD improves pregnancy outcomes significantly (5).

Despite all the progresses in different aspects of managing CKD, before, during and after the gestational period, many issues remain unresolved. There is still a considerable risk for pregnancy complications, especially in women with more severe forms of CKD. Additionally, true risks for poor obstetric outcomes cannot be predicted accurately (10).

We have come a long way, however, we are far from the end of the road. Most of the published data is from developed countries, while there is a wide gap in fetal survival rates and access to medical care throughout the world. The prevalence of CKD is roughly the same in men and women, but women are less likely to receive dialysis or kidney transplant. Also, we still cannot confidently inform women with CKD about their prospects for a successful pregnancy. That's why we need to continue the current progress and include, value and empower women all across the world.

#### Authors' contribution

AA is the single author of the manuscript.

#### Conflicts of interest

The author declares no conflict of interest.

#### Ethical considerations

Ethical issues (including plagiarism, data fabrication, double publication) have been completely observed by the author.

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