Chronic Kidney Disease in India
A Clarion Call for Change

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Introduction

CKD, with its high prevalence, morbidity and mortality, is an important public health problem. With <3% of land mass, India hosts 17% of the Earth's population. Large numbers of patients below the poverty line, low gross domestic product, and low monetary allocations for health care have led to suboptimal outcomes. Moreover, CKD and other noncommunicable diseases have often been ignored in the face of persistent challenges from and competition for resources for communicable diseases and high infant and maternal mortality (1).

CKD

Several issues contribute to high prevalence of CKD in India. United Nations Children's Emergency Fund data show that 28% of children are <2.5 kg at birth. Hypovitaminosis A and other nutritional issues during pregnancy may cause smaller kidney volume at birth and a lower eGFR (2). Consanguinity and genetic inbreeding increase risk of congenital anomalies of the kidney and urinary tract and obstructive or reflux nephropathy. Poverty, poor sanitation, pollutants, water contamination, overcrowding, and known and unknown nephrotoxins (including heavy metals and plant toxins in indigenous remedies) may lead to glomerular and interstitial kidney diseases. Added to these exposures are the growing burden of hypertension and diabetes mellitus. By 2030, India is expected to have the world's largest population of patients with diabetes.

Because of challenges in access to care, over 50% of patients with advanced CKD are first seen when the eGFR is <15 ml/min per 1.73 m^2 (3). This sobering number highlights the need for robust screening programs for those at risk for CKD. The reported prevalence of CKD in different regions ranges from <1% to 13%, and recently, data from the International Society of Nephrology's Kidney Disease Data Center Study reported a prevalence of 17% (4). The etiology of CKD varies considerably throughout India. Parts of the states of Andhra Pradesh, Odisha, and Goa have high levels of CKD of unknown etiology (CKDu), which is a chronic interstitial nephropathy with insidious onset and slow progression (5).

Compounding these issues is the sobering fact that 1.3 billion people are served by 1850 nephrologists who are unequally distributed but mostly concentrated in urban centers. Nephrology training positions are inadequate to grow the workforce, and the situation is worsened by "brain drain" to developed countries.

ESKD

The true burden of ESKD in India is not known, with few dedicated centers for care, lack of universal access to RRT, and absence of a registry. Even today, over 90% of patients requiring RRT in India die because of inability to afford care, and even in those who do start RRT, 60% stop for financial reasons. Among patients who undergo kidney transplantation, unexpected complications have the potential to impose serious financial hardships.

Hemodialysis (HD) was introduced in India in 1962, transplantation was introduced in 1971, and peritoneal dialysis (PD) was introduced in 1991. As of 2017, RRT is predominantly a private health care–driven initiative. There are over 130,000 patients receiving dialysis, and the number is increasing by about 232 per million population, a reflection of increasing longevity in general. Early immunization against hepatitis B is implemented in less than one quarter of patients with advanced CKD (3), and only a few have adequate titers of protective hepatitis B surface antibodies (6). Patients referred late are often anemic, have lower likelihood of hepatitis B immunization, start dialysis without an arteriovenous fistula, and have poorer prognosis and higher mortality at dialysis initiation. Protein energy wasting is present in 68%–93% of patients on dialysis from middle and lower socioeconomic strata (7).

HD is the most common modality followed by transplantation, and PD is a distant third. India is estimated to have about 120,000 patients on HD. The recurring cost of a session of HD is approximately $9–$45 (without costs for allotted space and machines), but expenses incurred by the patient vary greatly.

The urban locations of HD units make PD attractive for the majority of rural patients, but lack of health insurance coverage and prohibitively expensive recurring costs (approximately $350–$400 monthly) are deterrents (8). Despite these barriers, PD utilization is increasing. India is estimated to have over 8500 patients on PD. Timely supply of PD fluid to remote regions across mountainous terrains and villages without adequate road access and hospital access for evaluation and treatment of PD-related infections

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are important challenges. The problems of unhygienic living conditions and nonavailability of a separate clean room for PD (especially for those living in mud huts) are being addressed. In areas where clean running water is unavailable for hand washing before doing a PD exchange, patients are taught to use water with dilute potassium permanganate solution instead.

Transplantation practices are dependent on state welfare funding, brain death declaration practice, personal religious beliefs, and availability of technical expertise and expensive immunosuppressive medication. Living donor kidney transplantation far exceeds deceased donor transplantation. However, despite its cost-effectiveness, high initial costs and limited availability of living related donors are barriers. The imbalance between availability of organs and the need for transplantation has led to the regrettable unregulated practice of illegal living donor transplants in several south Asian countries, including India. Furthermore, infections are an important cause of mortality in transplant recipients.

Ongoing Efforts and Future Solutions

The challenge of patient care seems daunting. Education regarding diet and smoking avoidance, improved antenatal care, and community-level screening for noncommunicable diseases, like diabetes and hypertension, at the primary health care level must be universally implemented. Awareness regarding CKD must increase. CKD prevention and delaying progression by timely interventions are important public health objectives. Success necessitates the united effort of the government, nongovernmental organizations, philanthropists, and community members.

The World Health Organization Package of Essential Noncommunicable Disease Interventions promises hope for CKD prevention. Early diagnosis of CKD made by screening those with diabetes, hypertension, autoimmune diseases, or family history of CKD must become a priority. The Indian Society of Nephrology has made education modules for community physicians with helpful algorithms regarding CKD management and timely nephrology referral. It is hoped that this translates into most patients with CKD being managed appropriately by primary care and family physicians, with appropriate referral to nephrologists when needed. Subsequent follow-up of these patients should continue to be under their primary care physician, with only periodic visits to the nephrologist until advanced stages of CKD are reached and advanced care, like RRT, becomes necessary. The International Society of Nephrology has funded screening programs. The CKDu core group conducts research into its etiology, and this should translate into reducing incidence. To study risk factors and rate of CKD progression as well as development of cardiovascular disease, the Indian Chronic Kidney Disease Study cohort is presently recruiting about 5000 patients (9).

Some patients are able to afford access to RRT by government health insurance schemes (where available) that provide chronic twice weekly HD, PD, or transplantation for the underprivileged. This is a boon for the beneficiaries. The Indian Government, in its Healthcare Union Budget 2016, announced the plan for stand-alone HD centers for patients with ESKD, and the National Dialysis Services Program proposes that each district hospital offer HD services in a Public Private Partnership model. Training of patients on PD and caregivers in transmitting photographs of PD fluid bags and exit sites to the physician is enabling early diagnosis and treatment of infections. Implementation of the Transplantation of Human Organs Act (THOA) and bad publicity in the press and social media have considerably curtailed commercial transplantation. The unequivocal and universal implementation of the United Nations Trafficking Protocol may eliminate this bane from society. The THOA has led to organ sharing partnerships between private and government hospitals in some states, and this has revolutionized deceased donor transplantation. The Tamil Nadu Cadaver Transplant Program is an example, having done 5092 organ transplants, including 1655 kidney transplants, in under a decade. This is a direct result of education and promoting awareness in the community. Increasing numbers of deceased donor transplantation (although clearly insufficient) may gradually narrow the gap between donor requirement and availability, and they have also dented commercial transplantation (10).

Conclusion

Like other developing countries, India has unique situations and challenges that influence early diagnosis and management of CKD. Facilities and expertise available in different parts of the country are unequally distributed. Prevention and early detection of CKD mandate involvement of physicians at all levels. Most patients with CKD can be managed by their primary physicians with timely nephrology referrals. The Indian Society of Nephrology modules should increase competence and lead to uniformity of delivered care. Welcome initiatives, such as governmental provision of affordable and easily accessible RRT (where available), drastic reduction in commercial transplantation, and increasing deceased donor transplants, are improving care of patients with ESKD.

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Disclosures

None.

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