Nephrology in Tamil Nadu

Abstract

Tamil Nadu is one of the first few Indian states to start nephrology services and training. Over the decades, nephrology has expanded exponentially in Tamil Nadu. This growth is due to impactful initiatives by the government and private sectors. Accessibility to sophisticated kidney care, including dialysis and kidney transplantation, for all strata of the society across the state is a remarkable achievement. Advances in deceased donor transplantation, widespread nephrology training and society-level screening programs for kidney disease, and provision of peritoneal dialysis dialysate bags to beneficiaries at their residence are some notable phenomena in the current nephrology scenario of Tamil Nadu.

Keywords: *Tamil Nadu, Nephrology, CKD*

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Introduction

Tamil Nadu has established itself in the history of Indian nephrology with several 'firsts' to its credit. The first qualified nephrologist in India, Prof. M.S. Amaresan, established a nephrology department at Madras Medical College (MMC). The first hemodialysis (HD) and kidney transplants in India were done at Christian Medical College (CMC), Vellore. The strong public and private health infrastructure makes nephrology services widely available in all 38 districts of the state. Currently, there are about 400 qualified nephrologists in the state.

Overall Scenario of Health Sector

Tamil Nadu is the sixth most populous state of India, with an estimated population of 8.4 crores. The robust government health system has ensured steady progress, with 60% and 40% government health facility utilization in rural and urban areas, respectively, against the national average of 37%. Tamil Nadu is among the top three Indian states regarding health indices. All districts have government medical colleges. The private sector has grown significantly and made tremendous contributions towards health care.

The Global Burden of Disease report has highlighted the epidemiologic transition in India with an exponential increase in non-communicable diseases (NCDs). In Tamil Nadu, NCDs contribute to 69% of premature deaths and 68% of disability-adjusted life years.[1,2] Chronic kidney disease (CKD) is the fifth most common cause of mortality in the state.

Chronic Kidney Disease Prevalence

In 2022, the Institute of Nephrology & Community Medicine, MMC, conceptualized a pioneering state-wide CKD prevalence study executed by the Directorate of Public Health. This randomized cluster sample study encompassing the entire state revealed the hypertension (HTN) (33.9%), diabetes (17.6%), and CKD (8.4%) prevalence in adults (unpublished data). About 50% of patients with CKD did not have diabetes or HTN.

CKD of unknown etiology (CKDu) is a menace in Tamil Nadu. Several CKDu hotspots have been identified. CKDu clustering in northern districts has been coined -- '*Thondaimandalam Nephropathy*"[3]

Nephrology Services in Tamil Nadu

The Tamil Nadu government has been playing a pivotal role in establishing and promoting nephrology services. There are 54 qualified nephrologists in 20 public sector hospitals, most in the country. Under the Prime Minister's National Dialysis Program, Tamil Nadu has established 139 HD centers, with 1,219 dialysis machines. These centers are managed by trained

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physicians and dialysis technicians with assistance and guidance from nephrologists. Although dialysis has been made universally accessible, ensuring quality remains a challenge.

The Chief Minister's Comprehensive Health Insurance (CMCHIS), 2012 by the Tamil Nadu government aimed to provide equitable tertiary care access to individuals below the poverty line. The Pradhan Mantri Jan Arogya Yojana and CMCHIS merger allowed ~1.4 crore families (annual income < Rs 1,20,000) to enroll for health insurance. Health insurance covers a wide range of services, including acute kidney injury (AKI), rapidly progressive glomerulonephritis, continous renal replacement therapy, kidney biopsy, HD, continuous ambulatory peritoneal dialysis (CAPD), and kidney transplantation. Since the CMCHIS launch, maintenance HD remains the most utilized package, covering 13.16 lakh sessions and a Rs 1,077 crore claim. So far, about 4,500 renal transplant surgeries have been done under the scheme. Post-transplant immunosuppressives, procured centrally by Tamil Nadu Medical Services Corporation (TNMSC), are provided free of charge for life to those who undergo transplantation in government or private hospitals. The Tamil Nadu government launched its flagship program, '*Makkalai Thedi Maruthuvam*' (MTM), which translates to '*Medicare searching the masses*', in 2022. Under this program, trained health staff periodically visit the residences of patients with HTN and diabetes. They check blood pressure and capillary blood glucose, and deliver anti-hypertensives, anti-diabetics, and CAPD dialysate bags. Patients on CAPD undergo medical check-ups. MTM has improved CAPD use in the state, with about 300 patients availing CAPD services, currently. A new kidney disease screening program, Urine Dipstick for Proteinuria was launched. All adults with HTN, diabetes, and at high kidney disease risk undergo screening. Among the 57.5 lakh people screened so far, 13,000 tested positive (0.2%). Further evaluation showed 947 people with CKD (7.2%).[4]

Renal Transplantation Services

Notable features of the Tamil Nadu Kidney Transplant Program include widespread availability, easy access, free-of-cost transplant under insurance schemes in government and impaneled private hospitals, and provision of life-long immunosuppressives free-of-charge for underprivileged patients. Prof. M. A. Muthusethupathi established a sustained, regular living-related donor kidney transplant program at MMC in 1987. Currently living donor kidney transplants are done in 13 government institutions. The 'Tamil Nadu model', set by the state's pioneering efforts in the deceased donor organ transplant program, has been replicated in several others. Tamil Nadu State Organ and Tissue Transplantation Organization (SOTTO), known as the Transplant Authority of Tamil Nadu (TRANSTAN), functions as a registered society under the ex-officio chairmanship of the Chief Minister. The Member Secretary oversees its functioning. The Tamil Nadu Deceased Donor Transplant Program includes equitable access, involvement of many institutions, web-app-based transparent organ allocation system, etc. Deceased donor kidney transplantation is performed in 10 government institutions, and 35 others (including some district headquarters hospitals) have been classified as Non-Transplant Organ Retrieval Centers (NTORCs). In addition, 134 private sector hospitals have been registered with TRANSTAN. So far, in 2024, 259 deceased donations have taken place, with a donation rate >3 pmp, far exceeding the national rate.

Continuous Ambulatory Peritoneal Dialysis (CAPD)

A regular CAPD program was started in the country by Prof. Georgi Abraham. He played a pivotal role in establishing CAPD services in the state by training several nephrologists. He served as the Founder President of the Peritoneal Dialysis Society of India. Though CAPD penetration remains low, recent developments like the inclusion of CAPD under MTM and the placement of CAPD catheters in some government institutions by nephrologists have catalyzed the program. Dr. R. Manorajan, Madurai Medical College, is the state nodal officer for the CAPD program.

The state has a well-established private health sector throughout and remains a popular destination for medical tourism. CMC, Vellore has made seminal contributions towards the growth of Nephrology as a specialty in India. The first HD in India was done at CMC in 1961 using a Kolff twin coil machine by Dr. Philip Koshy, Professor of Medicine. In 1971, the first successful kidney transplantation in India was also done at CMC by Dr. K. V. Johny and Dr. Mohan Rao. There are several private/corporate hospitals providing comprehensive renal care across the state.

Nephrology Training

Prof. M. S. Amaresan established the Department of Nephrology at Government General Hospital, MMC in 1972. It was the first government tertiary renal care center in South India and the fourth-oldest nephrology department in the country. It played a key role in the growth of nephrology in the state. Prof. J. C. M. Shastry (a future national leader in nephrology) was the first candidate in the first DM Nephrology Course (1974) in Tamil Nadu at CMC, Vellore. Prof. Muthu Jayaraman was the first candidate in the following program (1978) by MMC Chennai. So far, MMC and CMC have produced 143 and 127 nephrologists, respectively.

The nephrology unit, MMC has made several notable contributions on– AKI due to leptospirosis, toxic nephropathies, regular living donor kidney transplantations, regular deceased donor transplantation (2008), first maintenance HD unit in the government sector (2013), etc.

The nephrology training program is available in 21 centres. Every year 59 (39 DM and 20 DrNB) graduates qualify from the state [Table 1].

Pediatric Nephrology

Prof. B. R. Nammalwar, established the first pediatric nephrology unit in the Institute of Child Health, an affiliated institution of MMC. Currently, the unit is offering comprehensive pediatric renal care, including kidney transplantation [Table 2].[5] There are four well-established pediatric nephrology units in the private sector.

Voluntary Organisations

Tamil Nadu Kidney Research Foundation (TANKER), founded in 1993 by Dr. Georgi Abraham, initiated maintenance HD services at very subsidized charges. The organization has progressed over three decades, with 14 centers and 250 dialysis machines. Inspired by TANKER, organizations like Lion's and Rotary Club opened several other dialysis centers. These centers played a big role in the maintenance dialysis program, particularly before the inclusion of dialysis under insurance schemes. Multi-Organ Harvesting Aid Network (MOHAN) Foundation, by Dr. Sunil Shroff, has supported the deceased donor transplant program by providing trained grief counselors to hospitals. Sapiens Health Foundation, started by Dr. Rajan Ravichandran, in 1997, spreads awareness of kidney disease, with a special focus on cutting down salt consumption.

Table 1: Overview of nephrology in Tamil Nadu

Nephrologists	~ 400
DM Nephrology training centers (39 candidates)	11 (6 government and 5 private institutions)
	Government institutions:
	Madras Medical College
	Stanley Medical College, Chennai
	Kilpauk Medical College, Chennai
	Madurai Medical College
	Tirunelveli Medical College
	Mohan Kumaramangalam Medical College, Salem
	Private institutions:
	Christian Medical College, Vellore
	PSG Medical College, Coimbatore
	Sri Ramachandra Institute of Higher Education & Research
	SRM Medical College, Kattankulathur, Chennai
	Saveetha Medical College, Chennai
DrNB Nephrology training centers (20 candidates)	10 private institutions
	Apollo Hospitals, Chennai
	MIOT Hospital, Chennai
	SIMS Hospitals, Chennai
	Meenakshi Mission Hospital, Madurai
	KG Hospital, Coimbatore
	Kauvery Hospitals, (Chennai & Salem – 2 each)
	Kovai Medical Centre, Coimbatore
	GKNM Hospital, Coimbatore and Sri Abirami Kidney care centre, Erode
Dialysis centers under PMNDP	139
Renal transplant centers	145 (132 Private,13 Government)
Transplant surgeries (in 2023)	1633 (LRRT 1328, DDRT 305)
Patients currently on CAPD	500

PMNDP: Prime minister's national dialysis programme, CAPD: Continous ambulatory peritoneal dialysis, LRRT: Live related renal transplant, DDRT: Deceased donor renal transplant.

Nephropathology

Prof. Anand Date, CMC Vellore, and Dr. Rama Mani, Apollo Hospitals, Chennai, have been the pioneers of nephropathology services in Tamil Nadu. Dr. Anila Kurien (Renopath, Centre for Renal and Urological Pathology, Chennai), a contemporary nephropathologist, caters to most of the centers of the state. She elucidated Nell 1 antigen association with indigenous medicine-associated membranous nephropathy.

Interventional Nephrology

Tamil Nadu contributed to the growth of interventional nephrology in South India. Dr. J. Balasubramanian (Tirunelveli) and Dr. K. Sampath Kumar (Madurai) have been pioneers in the field of interventional nephrology.

Table 2: Stalwarts of Nephrology in Tamil Nadu and their contributions

Prof. M. S. Amaresan	Established the Department of Nephrology in Madras Medical College in 1971 and laid a strong foundation for its growth
Prof. M. A. Muthusethupathi	Played a key role in establishing and streamlining the transplant program in Madras Medical College for the underprivileged, free of charges.
	Reported the first Indian case series on leptospiral AKI, established the Indian Leptospirosis Society and Research Lab in collaboration with KIT, Amsterdam.
Dr. M. K. Mani	Pioneered a low-cost model to prevent and retard progression of CKD at a rural community level by adopting simple screening and therapeutic strategies to address HTN, diabetes, and CKD with the involvement of local volunteers through Kidney Help Trust[5]
Prof. B. R. Nammalwar	First qualified pediatric nephrologist of South India. He started the Pediatric Nephrology Unit of the Institute of Child Health, Chennai in 1985.

CKD: Chronic kidney disease, HTN: Hypertension

Women in Nephrology

Women contribute to 20% of the nephrology workforce in the state. There are 80 active members in the Tamil Nadu Women in Nephrology unit. Prof. Muthu Jayaraman is one of the first few women nephrologists of India.

The MMC has conducted a state-wide competitive examination (Prof. M. A. Muthusethupathi Gold Medal Examination) for post-graduate general medicine and pediatric trainees since 2000. This examination has become popular. In 2024, a record-high number of 350 students from 27 centers participated in it.

Dr. M. Jayakumar's Gold medal, instituted by the MMC Nephrology Alumni Association, is awarded to the topper of the DM Nephrology examination conducted by Dr. M. G. R. Medical University.

Academic Meetings

Annual academic conferences are held by Nephrology Association of Tamil Nadu & Puducherry (NATPU), MMC Nephrology Alumni Association (NEPHSIL), CMC (Renal Clinical Conference), Madurai Kidney Centre & Transplantation Research Institute (Dr. T. Dhinakaran) and WIN Tamil Nadu. Monthly academic sessions are held by nephrology associations of Chennai, Tiruchirapalli & Thanjavur (TANTRA), Madurai, Tirunelveli, Thoothukudi & Kanyakumari Nephrology Group (TTKNG) and Coimbatore.

Nephrology Education through WhatsApp platform

Dr. P. Ravichandran started this in 2015, through a WhatsApp group, 'Nephrology Update', which has received widespread appreciation and has more than 2,000 members. INForm (Dr. J. Balasubramanian, 2021, 711 members) and Peculiar Renal Transplant Cases (Dr. Vel Arvind & Dr. T. Rajarajan, 2022, 1,023 members) are the other popular groups with large memberships from the world. These groups serve as ready reckoners for updated information, provide a platform for discussion among experts, and share volumes of scientific material.

Research Scenario in Nephrology

- A CKD prevalence study in the adult population of Tamil Nadu has been conducted (funded by the National Health Mission, Tamil Nadu). This is a novel state-wide study applying the randomized cluster sampling method and has provided valuable information. (under publication process).
- A similar study has been conducted assessing CKD prevalence among agricultural laborers in Tamil Nadu (divided into five agro-climatic zones), funded by the Tamil Nadu Health System Project.

Both these studies have been jointly conducted by the Institutes of Nephrology & Community Medicine, MMC, and the Directorate of Public Health.

- The Institute of Nephrology, MMC, funded by the Indian Council for Medical Research (ICMR), is conducting an ongoing multi-centric follow-up study of survivors of dialysis requiring acute kidney injury (DRAKI).
- Prof. Suceena Alexander, CMC, Vellore started India Alliance GRACE -IgA N Platform Trial – a multi-centric, multi-arm, multi-stage, real-world pragmatic platform trial in IgA Nephropathy.
- The Department of Nephrology, MMC (Prof. Manoranjan and team) and Tiruchirapalli Nephrology group (Dr. SP SS Subramaniam) initiated CKDu field-level research studies.

Major Challenges

CKDu, AKI due to sepsis & toxins (paraquat, rodenticide poisoning), and complementary medicine-related glomerulopathy are some of the more prevalent issues warranting focus and research. Devising strategies to improve the quality of widely available dialysis therapy has been accorded priority.

Nephrology in Tamil Nadu has progressed significantly in all domains with significant support from the State Government and commendable contribution of the nephrology workforce of both government and private sectors.

Conflicts of interest: There are no conflicts of interest.

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