



Nephrology in Himachal Pradesh

Abstract

Nephrology in Himachal Pradesh began at the Indira Gandhi Medical College, Shimla, which, till recently, was the only tertiary care hospital providing nephrology services to the state. The first hemodialysis in the state was performed in 1977. The development of renal services has picked up in the last two decades. The National Pradhan Mantri National Dialysis Program has led to the expansion of dialysis services. Challenges include a need for a nephrology workforce. Active nephrology training programs and kidney transplants are needed to improve renal care and services. Further, renal registries in the state can improve the quality of the workforce and service delivery.

Keywords: AKI, CKD, Dialysis, ESKD, Kidney care

Himachal Pradesh is a mountainous state in northern India, situated in the western Himalayas. The total population of the state is 7.8 million. It is the least urbanized state in India, with nearly 80% of the population living in rural areas.¹ Nephrology in Himachal Pradesh began at the Indira Gandhi Medical College (IGMC), Shimla, the only tertiary care hospital in the state providing these services until recently. Dr. DJ Das Gupta from the Department of Medicine went to the USA in 1974 for a fellowship program in electron microscopy and dialysis in Chicago. In 1976, two used hemodialysis (HD) machines donated to the college by Dr. S. Mitra were shipped to India. The first HD in the state was performed in 1977.² Acute peritoneal dialysis (PD) was started in the mid-1980s, and the author (SV) witnessed one PD during his internship at IGMC, Shimla. Two HD machines, Cobe Century 2, for acetate dialysis were installed in 1994 at IGMC, Shimla. A separate department of Nephrology at IGMC, Shimla, came into existence in 2002. Table 1 depicts important milestones in nephrology services.

The Department of Nephrology at IGMC, Shimla, catered to hospitalized adult and pediatric patients requiring kidney care and started outpatient renal service for kidney patients, including those with non-dialysis chronic kidney disease (CKD), acute kidney injury (AKI), and those who were critically sick and needed nephrology

care.³⁻⁵ The department provided acute PD and HD to the admitted patients with acute and chronic kidney failure and drug and toxin poisoning. Membrane-based plasmapheresis with standard HD equipment was started in 2009.⁶ With the acquisition of a continuous renal replacement therapy (CRRT) machine in 2011, CRRT was provided to critically sick patients in intensive care units (ICUs). The department provided comprehensive critical care/ICU nephrology services, including PD, HD, slow extended dialysis (SLED), CRRT, and plasmapheresis.⁷ So far, over 1500 kidney biopsies have been performed, and 550 tunneled lines have been placed by the staff in the department.

Maintenance dialysis facilities were not available until 2009 when the first unit came up in the private sector. Until then the patients had to relocate outside the state for the maintenance HD and kidney transplants. The mountainous terrain makes commuting for maintenance HD difficult. Therefore, PD was the most viable dialysis modality for patients living in this region. Chronic PD was started in 2002.⁸ Under the chronic PD program, 175 patients were initiated on PD in over two decades, and several patients from far-flung remote areas have lived over ten years on PD.^{8,9} Many other patients were initiated on chronic PD by hospitals outside the state. As per the data shared by the providers of PD fluid, Baxter India and Mitra Industries

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Table 1: Important milestone in kidney care in Himachal Pradesh

Name of milestone	Year
First hemodialysis	1977
First peritoneal dialysis	1987
Cobe Century 2 machines	1994
Chronic PD started	2002
Machines with volumetric ultrafiltration and bicarbonate dialysis	2007
Plasmapheresis	2009
CRRT	2011
Kidney transplantation	2019

Chronic PD: chronic peritoneal dialysis, CRRT: continuous renal replacement therapy.

Pvt. Ltd., chronic PD has been used as a modality by 822 patients in the last two decades. Of these, 677 (82.4%) were on continuous ambulatory peritoneal dialysis (CAPD) and 145 (17.6%) were on automated peritoneal dialysis (APD); 470 (69.4%) patients received three exchanges daily, and 145 (17.6%) were on four exchanges daily; 287 (34.9%) PD patients used icodextrin. Twenty-seven patients have survived more than ten years on this therapy. Eighty-two (5.4%) of end-stage kidney disease (ESKD) patients are on chronic PD and the rest (95%) are receiving HD [Table 2].

Ever since the launch of the Pradhan Mantri National Dialysis Program (PMNDP) in 2016–2017, dialysis centers have been set up in various state districts, leading to a rapid expansion of maintenance HD services to remote and difficult regions in a short span of four to five years.¹⁰ Currently, 44 hospitals are providing dialysis services under the PMNDP. Dialysis technicians run most of these standalone dialysis centers without the direct supervision of nephrologists. Lahaul and Spiti, a district with difficult geography, harsh weather conditions, and the lowest population density in the country, does not yet have a dialysis center. Currently, 1521 patients are getting dialysis in the whole state, with a patient prevalence of 196 per million population or one person per 5000 people in the general population on dialysis. A large majority (94.5%) is on maintenance HD. Against the globally accepted standard of thrice-a-week dialysis, only 18.2% are on thrice-a-week HD, and the majority (78%) are on twice-a-week HD. About 78% were getting HD through the arteriovenous fistula (AVF), and tunneled HD catheters were the vascular access in 16.2%.

Almost all patients start their first dialysis in an emergency with a temporary catheter, and many subsequently are inserted with tunneled catheters and, at last, followed by AVF. First dialysis initiation with a well-formed AVF is a rarity. It can be primarily attributed to the societal preference for conservative methods for the management of CKD, with intervention as a last resort or to a fear of dialysis, which is perceived as an endless and invasive method of management. Dialysis adequacy is rarely measured.

Table 2: Important kidney care services in Himachal Pradesh

Name of the service	n (%)
Number of nephrology departments	3
Number of dialysis centers (public-private/private)	43
Number of nephrologists	3
Number of transplant centers	1
Number and range of nephrology training programs	1*
Number of nephrology trainees (total and passing out annually)	3*
Number of centers with intervention nephrology facilities	3
Number of patients on dialysis (in-center HD and PD)	1521
HD n (%)	1439 (94.6)
PD n (%)	82 (5.4)
Number of patients transplanted within the state	5
Current practice of maintenance HD (frequency, adequacy) n (%)	1439
Once a week n (%)	55 (3.8)
Twice a week n (%)	1122 (78)
Thrice a week n (%)	262 (18.2)
Vascular access	
Arteriovenous fistula n (%)	1125 (78.2)
Tunneled catheter n (%)	233 (16.2)
Temporary catheter n (%)	81 (5.6)
Current practice chronic PD	
CAPD n (%)	64 (78)
Three exchanges a day n (%)	45 (70.3)
Four exchanges a day n (%)	19 (29.7)
APD n (%)	18 (22)
Icodextrin n (%)	30 (36.6)
Research scenario	
Research publication n (%)	50
Research projects n (%)	4
Any specific policy initiatives	
PMNDP scheme (year)	2016
AB-PMJAY scheme (year)	2018
HIMCARE scheme (year)	2019

APD: automated peritoneal dialysis, CAPD: continuous ambulatory peritoneal dialysis, PD: peritoneal dialysis, HD: hemodialysis, HIMCARE: The Mukhya Mantri Himachal Health Care Scheme, AB-PMJAY: Ayushman Bharat-Pradhan Mantri Jan Arogya Yojana, PMNDP: Pradhan Mantri National Dialysis Program. *Nephrology training program approved from the year 2024.

Interventional nephrology facilities, such as ultrasound-guided kidney biopsy, tunneled and non-tunneled HD catheters, PD catheter placement, and the creation of AVF, are available at IGMC, Shimla; All India Institute of Medical Sciences (AIIMS), Bilaspur; and Dr. Rajendra Prasad Government Medical College (RPGMC), Tanda. Therefore, these are also referral centers for patients requiring hospitalization for infectious or noninfectious or access-related complications.

Since the inception of PMNDP, the focus of dialysis has shifted to HD, to the detriment of those living in remote areas. A policy change on these issues can only improve PD penetration.

The Department of Nephrology at IGMC, Shimla, has been providing follow-up medical care to about 30 kidney transplant patients who were transplanted outside the state; four of them had a posttransplant period of 20–25 years. The kidney transplant program was started in 2019 at IGMC, Shimla, and five patients have undergone successful living donor transplants. This program was halted during COVID-19, and efforts are being made to restart it.

Alongside the Ayushman Bharat-Pradhan Mantri Jan Arogya Yojna (AB-PMJAY) that provides cashless treatment for secondary and tertiary care hospitalization to people experiencing poverty, the state has started the Mukhya Mantri Himachal Health Care Scheme (HIMCARE) since January 1, 2019. Care is delivered through empanelled hospitals.¹¹ HIMCARE provides cashless treatment coverage to left-out families, analogous to AB-PMJAY. However, the scheme does not cover Outpatient Department (OPD) care or dialysis medications.

Community engagement activities to raise awareness about kidney diseases are done through talks on radio and television, celebrations of World Kidney Days, and organization of health camps with support from the Kidney Care Society. A PubMed search showed 50 research publications from the Department of Nephrology, IGMC, Shimla. The research areas included tropical AKI, glomerular diseases, anemia of CKD, CAPD, and critical care nephrology. It was one of the centers that participates in the famed Indian Chronic Kidney Disease Study.¹² There is no active renal disease registry in the state.

There is a considerable shortage of nephrology workforce and no active nephrology training program in the state. Only three nephrologists work in the state, that is, 0.4 per million against the national average of 1.9 per million.¹³ The training of the renal care workforce, such as dialysis technicians and dialysis nurses, is run at IGMC, Shimla, and AIIMS, Bilaspur. Nurses are required to receive one year of practical training in dialysis in the dialysis unit, in addition to the basic nursing training. Over a dozen nurses had on-the-job training in the dialysis unit at IGMC, Shimla. They were skilled in the delivery of all modalities of dialysis, namely acute PD, HD, SLED, CRRT, and plasmapheresis. They were instrumental in providing comprehensive critical care/ICU nephrology services, that is, all dialysis modalities that are available at a few select public sector hospitals in the country. A graduate degree course, Bachelor in Dialysis Technology, to train dialysis technicians with an annual intake of five students each is operational in IGMC, Shimla,

and AIIMS, Bilaspur. From 2024, a Doctorate of Medicine (DM) nephrology training program with three seats has been approved at AIIMS, Bilaspur.

Conclusion

Nephrology had a head start in Himachal Pradesh but needed to catch up due to slow growth. However, in the last two decades, the development of renal services has picked up. PMNDP has led to the rapid expansion of dialysis services in various districts and small towns. Challenges include a need for a nephrology workforce, active nephrology training programs, and kidney transplant services. Renal registries in the state can improve service delivery and help with the tracking of outcomes.

Conflicts of interest

There are no conflicts of interest.

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