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Catastrophic Health Expenditure and Distress Financing Among Patients With Nondialysis Chronic Kidney Disease in Uddanam, India

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INTRODUCTION

Chronic kidney disease (CKD) is the third fastest growing cause of death worldwide and projected to rise to fifth place in the list of causes of death in 2040.[1] The burden is particularly high and growing rapidly in transitional countries, especially among rural communities of tropical countries.

Treatment of CKD is expensive. An estimated 188 million people experience catastrophic health expenditure (CHE) annually because of kidney diseases across low- and lower middle-income countries, the greatest of any disease group.[2] Studies have focused on costs of treating advanced stages of CKD with dialysis and/or transplantation. Patients with earlier stages of CKD need long-term care, have multiple comorbidities that require specific treatment, and likely incur substantial health care expenditure, which has not yet been quantified. In one study, patients with CKD made 10.8 physician visits per year.[3] Another study reported that 60% of patients with stage 3 CKD consumed ≥5 medications/d.[4]

Uddanam is a high CKD-burden region in India with an adult population prevalence of CKD of 21%,[5] almost 3 times that described from elsewhere in the country, but it has scarce kidney care services. Despite the commitment to provide universal health coverage to the population, outpatient care for chronic disease management including CKD has remained excluded from the ambit of the universal health coverage.

We undertook this study to understand the household financial burden in the care of patients with predialysis CKD in rural communities in Uddanam.

RESULTS

We enrolled a total of 221 patients (mean age: 57.4 years, 51.6% females) with a mean estimated glomerular filtration rate of 21 ml/min per 1.73 m^2 (95% CI: 20–22 ml/min per 1.73 m^2) and duration of illness of 4.1 ± 3.2 years (Supplementary Table S1). A total of 77 (34.8%) had hypertension, 11 (5%) had diabetes, and 8 (3.6%) had both.

Socioeconomic status was evaluated by modified Kuppuswamy scale,[6] which classifies families into 5 groups based on education, occupation, and aggregate income of the family (details in Supplementary Methods). Most (75.6%) belonged to the upper lower socioeconomic status category (Table 1). The median annual household income was US$ 2468.7 (95% CI: 2248.5–2688.9).

Most of the patients (57%) sought treatment from private hospital/clinics, with 23% going to government hospitals whereas 44 (19.9%) had used a mix of both government and private facilities.

Health Care Costs

Median total annual cost of illness was estimated at US$ 308 (interquartile range: 184–482). Direct costs made up for 79.9% of the total treatment costs. The costs for medicines constituted the highest portion of the direct cost, followed by laboratory charges and transport (Table 2). Patients made 6 (95% CI: 4–10) clinic visits in a year and were receiving 5 ± 2 medicines. Approximately 57% reported obtaining medicines from private pharmacies. The cost of care was higher in those who attended private facilities, largely owing to the high costs of medicines (Supplementary Figure S1).

Table 1. Distress financing for the care of chronic kidney disease

Parameter	Number of cases	Number resorting to distress financing[a]
Total	221	86 (39)
Sex		
Male	107	44 (41.1)
Female	114	42 (36.8)
Type of facility		
Government	51	6 (11.8)
Private	126	58 (46)
Both	44	22 (50)
Socioeconomic status		
Upper	0	0
Upper middle	22	6 (27.3)
Lower middle	29	6 (20.7)
Upper lower	167	73 (43.7)
Lower	3	1 (33.3)

[a]Defined as borrowing from family/friends, selling possessions, or taking out loans to fund health care. Figures in parentheses are percentages.

CHE and Distress Financing

Costs for CKD care services were catastrophic for 149 patients (67.4%) at the 10% annual household income threshold.[7] Supplementary Table S2 reveals the frequency of CHE at other income thresholds. Those visiting private facilities experienced CHE more frequently. A total of 86 patients (39%) engaged in distress financing (Table 2). Patients seeking care in private facilities were more likely to resort to distress financing.

DISCUSSION

This is the first study to evaluate the economic impact of treatment of predialysis CKD. Almost 7 of every 10 households that have a member with CKD experienced high expenditure attributable to medical care, and 40% of this population living at the margins of subsistence resorted to distress financing.

Our data are of policy relevance because almost 1 of every 5 adult residents in the region has CKD.[5] The current focus of government spending on the care of patients with kidney disease is almost entirely on dialysis. The cost of outpatient care for earlier stages of CKD is not covered by government programs. Given that the far greater number of patients with earlier stages of CKD will not need dialysis, the neglect of the economic burden of these patients who are left to seek care from private facilities on their own represents a major failure of the principles of the universal health coverage that will continue to push households into impoverishment.

The most effective way to forestall this economic hardship is to institute programs for early detection of CKD and implementation of measures that can prevent progression and development of complications. Uddanam is in the state of Andhra Pradesh, one of the better performing states in terms of health care indicators—placed at number 4 of the 35 Indian states. Nevertheless, a lot needs to be done to improve noncommunicable disease care. Our previous study had found a 42% and 13% population prevalence of hypertension and diabetes, respectively, in the region in addition to the 21% CKD prevalence.[5] Most of these conditions were previously undiagnosed. These findings support the case to expand the scope of the national noncommunicable disease program to bring into its ambit early detection and evidence-based management of CKD, at least in the high CKD prevalence areas.

Given the high cost of care in the private sector, health care delivery needs to be strengthened in public health systems. Medications are responsible for more than 60.7% of total health care costs; hence, universal free access to essential medicines to patients

Table 2. Components of health care expenditure in 1 year according to the type of facility visited (public or private)

	Type of facility				
Parameter	Public	Private	Both	Total	As a % of total cost
Number of cases	51	126	44	221	
Direct cost					
Doctor's fees	0 (0–0)	16.2 (10.8–32.4)	13.5 (6.7–18.9)	12.1 (0–24.3)	4.4
Medicines	0 (0–74.9)	213 (155–323)	172 (90.2–353)	179 (79.3–291)	60.7
Laboratory charges	0 (0–0)	31 (17.5–54)	18.2 (6.7–39.1)	20.2 (0–40.5)	8.3
Transport	7.5 (2.7–8.1)	16.2 (4.32–43.2)	14.6 (6.6–64.7)	9.7 (4.9–32.4)	6.5
Total direct cost	0 (0–74.9)	280 (211–408)	232 (127–382)	222 (114–337)	79.9
Indirect cost					
Travel time	3.8 (2.5–7.6)	7.6 (2.8–15.2)	7.6 (4.4–18.9)	7.6 (2.8–12.6)	2.5
Hospital waiting time	7.6 (3.8–15.2)	12.6 (7.6–18.9)	14.2 (7.6–21.5)	11.4 (6.9–18.9)	3.7
Loss of production days	20.2 (0–60.7)	30.4 (0–60.7)	40.5 (0–60.7)	30.4 (0–60.7)	13.9
Total indirect cost	36 (17.7–72.1)	49.9 (22.7–111)	64.5 (37.6–85.6)	52.1 (22.1–87.2)	20.1
Total cost	80.2 (39.1–140)	389 (276–560)	320 (197–469)	308 (184–482)	100

INR, Indian rupee; USD, United States dollar.
Data are presented in USD as median (interquartile range). 1 USD = INR 74.132.

with kidney diseases is critical. The state government has introduced a program that provides financial aid to patients on dialysis to offset out-of-pocket costs. If publicly funded health programs do not reach those in need, similar cash transfers may be needed to support households that have people with earlier stages of CKD. Investment will be needed to develop capacity in delivering evidence-based care in the public health care system. This includes training in identifying and treating CKD using innovative approaches, such as task shifting and use of technology-enabled decision support tools, which have received a lot of attention during the recent COVID-19 pandemic.

Our study has a few limitations—although we tried to collect documentation on direct costs, in some instances where documents were not available, we needed to depend on recall, which could be subject to bias. Furthermore, we collected cost data for 6 months and extrapolated that for 1 year which may have added uncertainty in calculation. We used minimum wage rate for calculating productivity loss which may not be correct for all who were employed and did not calculate productivity losses for caregivers, both of which might have contributed to underestimating costs owing to lost productivity. Finally, although the data presented here can be generalized to the population in the region, studies are needed from other geographies to confirm the generalizability of these findings to other populations in India.

We defined CHE as health expenditure >10% of total household income, as recommended by the Inter-Agency Expert Group on Sustainable Development Goals.[7] Other reports compute CHE at various and multiple levels. Although income best reflects a household's capacity to consume goods and services, consumption expenditure may be the more valid measure of economic resources in settings with large proportion of employment outside of the formal sector. As we did not collect consumption expenditure data, we relied on income as denominator. To report the uncertainty on using income for calculating CHE, we used different thresholds to check the proportion facing CHE (Supplementary Table S2).

In conclusion, a large proportion of households with CKD in Uddanam experience CHE and resort to distress financing. Targeted programs are needed to mitigate the economic hardships experienced during care for CKD and other noncommunicable diseases.

DISCLOSURE

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SUPPLEMENTARY MATERIAL

Supplementary File (PDF)

Supplementary Methods (with references).

Table S1. Demographic details of study participants.

Table S2. Catastrophic health expenditure by select patient demographics.

Figure S1. Health care spending according to the type of health facilities used for care of CKD.

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