Healthcare resource utilization and cost of renal replacement therapy in Brazil: a five-year patient-level analysis.

RWD28

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INTRODUCTION

- Patients with end-stage kidney disease (kidney failure) imperatively require life-saving renal replacement therapy (RRT) which includes modalities such as peritoneal dialysis, hemodialysis and kidney transplant, consequently incurring high costs.(1)
- In Brazil, patients can claim health services from SUS (Unified Health System) or SH (Supplementary Heath System) or from both, according to their work status, financial conditions, or availability of health services.
- Both SUS and SH provide RRT-related procedures as part of their standard care. (2)

OBJECTIVE

- In this patient-level analysis we explored health resource utilization (HRU), and medical costs of patients submitted to kidney transplant at SUS who were simultaneously covered by SH.

METHODS

- This patient-level retrospective analysis was conducted over a 5-year period, from Jan-2015 to Dec-2019.
- We used publicly available administrative claims data from the SUS and SH. A probabilistic record linkage (RLK) method was applied to allow the longitudinal assessment at patient-level. (3)
- The cohort included patients ≥ 18 years, submitted to kidney transplant at SUS and to dialysis or other RRT-related procedure at SH, ≥ 6 months of follow-up prior and after transplantation.
- Costs were in Brazilian real (BRL) and converted to US dollar (USD); 1 USD = 4.0943 BRL, in mid-December 2019.

Table 1- Overall healthcare resource related to renal replacement therapy used by patients in SH and SUS, 6 months prior and after kidney transplant.

Variable	SH		SUS	
(Sample:219 patients)	Pre-transplant	Post-transplant	Pre-transplant	Post-transplant
Overall				
N (%)	187 (85.4)	61 (27.9)	200 (91.3)	216 (98.6)
Mean (SD)	27.04 (63.27)	10.74 (32.58)	35.45 (31.06)	49.87 (33.44)
Median (IQR)	3 (1 - 19)	3 (1 - 7)	26 (14.0 - 49.3)	41.5 (24.0 - 70.8)
Median PPPM [95%CI]	1.27 [0.90 - 1.70]	0.43 [0.21 - 0.84]	1.52 [1.39 - 1.66]	2.12 [1.99 - 2.25]
Ambulatorial care*				
N (%)	178 (81.3)	58 (26.5)	182 (83.1)	204 (93.1)
Mean (SD)	28.35 (64.58)	11.21 (33.34)	16.36 (17.03)	22.4 (13.37)
Median (IQR)	3 (1 - 22.5)	3 (1.25 – 7.0)	11.5 (3.0 - 25.0)	19 (12 - 30)
Median PPPM [95%CI]	1.33 [0.94 - 1.78]	0.45 [0.22 - 0.87]	0.74 [0.65 - 0.84]	0.95 [0.91 - 1.00]
Hospitalization**				
N (%)	10 (4.6)	5 (2.2)	2 (0.01)	44 (20.1)
Mean (SD)	1.10 (0.32)	1.25 (0.50)	-	2.04 (1.43)
Median (IQR)	1 (1 - 1)	1 (1 - 1.25)	-	1.5 (1 - 3)
Median PPPM [95%CI]	0.04 [0.04 - 0.05]	0.05 [0.03 - 0.06]	-	0.11 [0.08 - 0.14]
Medicines***				
N (%)	-	-	162 (74.0)	170 (77.6)
Mean (SD)	-	-	25.38 (20.00)	35.83 (21.94)
Median (IQR)	-	-	20 (12 - 33)	32 (19 - 48)
Median PPPM [95%CI]	-	-	1.05 [0.97 - 1.13]	1.51 [1.42 - 1.61]

RESULTS

- Cohort included 219 patients; mean age was 50.9 years (SD 12.9).
- Of total patients, 81.3% used ambulatorial care in SH pre-transplant with median of 1.33 times (Per Patient Per Month – PPPM) and 26.5% after kidney-transplant (0.45 times PPPM); Table1.
- In SUS, most patients used ambulatorial services before (81.3%) and after (93.1%) kidney-transplant, accounting for 0.74 times PPPM and 0.95 times PPPM, respectively; Table 1.
- Of total patients, 44.7% received hemodialysis at SH before kidney-transplant (2.22 times PPPM). More than 70% of patients received drugs at SUS; Table 1.
- Before transplantation, median costs of ambulatorial services were USD 127 PPPM in SH and USD 267 PPPM in SUS; Table 2.

CONCLUSIONS

- Insured patients undergoing kidney transplant in SUS impose a burden for both public and supplemental health sectors in Brazil. In SUS, besides the transplant surgery, patients used ambulatorial services before and after transplant, including dialysis, transplant follow-up, and drug acquisition. SH is mostly used for dialysis procedures before the transplant.

Table 2- Renal replacement therapy costs (in USD), 6 months prior and after kidney transplant, in both SH and SUS.

Cost per patient, USD	SH		SUS	
(Sample: 219 patients)	Pre-transplant	Post-transplant	Pre-transplant	Post-transplant
Overall				
Mean (SD)	2,540 (5,716)	875 (2,961)	5,922 (7,583)	4,285 (7,082)
Median (IQR)	206 (92 – 2,202)	138 (77 – 360)	340 (118 – 801)	1,122 (628 – 3,767)
Median PPPM [95%CI]	121 [87 – 159]	32 [12 – 69]	258 [222 – 296]	198 [154 – 248]
Ambulatorial care*				
Mean (SD)	2,666 (5,832)	906 (3,031)	6,090 (7,667)	1,322 (2,765)
Median (IQR)	206 (92 – 2,484)	137 (77 – 361)	3,100 (127 – 9,416)	761 (528 – 1,212)
Median PPPM [95%CI]	127 [91 – 167]	32 [12 – 72]	267 [228 – 306]	54 [43 – 68]
Hospitalization**				
Mean (SD)	56 (75)	211 (108)	93 (115)	2,339 (3,598)
Median (IQR)	31 (20 – 42)	206 (136 – 281)	94 (53 – 134)	957 (452 – 2,170)
Median PPPM [95%CI]	03 [01 – 06]	09 [04 – 15]	03 [00 – 06]	110 [66 – 167]
Medicines***				
Mean (SD)	-	-	424 (934)	5,054 (7,662)
Median (IQR)	-	-	105 (32 – 421)	761 (00 – 6,486)
Median PPPM [95%CI]	-	-	17 [13 – 22]	244 [171 – 329]
Transplant surgery, median (IQR)	-	-	11,322 (9,060 – 11,844)	

Notes - Tables 1 and 2:
CI: Confidence Interval, IQR: interquartile range, PPPM: Per Patient Per Month, SD: Standard Deviation, SH: Supplementary Health, SUS: Unified Health System, USD: United States Dollar.
*Care with 0 days of stay in SH.
** Care with 1 or more days of stay in SH.
***No drug dispensing is available at SH at ambulatorial basis (CIHA database). CIHA: Hospital and Outpatient Information Form database.
Cost was in Brazilian real (BRL) and converted to USD using the currency of mid-December 2019 (1 USD = 4.0943 BRL).

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