



Shared Decision Making Increases Living Kidney Transplantation and Peritoneal Dialysis

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ABSTRACT

Background. Hospital accreditation in Taiwan encourages greater use of shared decision making (SDM) in health care. This study aimed to explore the distribution change of treatment modalities for renal replacement therapy (RRT) before and after the use of SDM in newly diagnosed end-stage renal disease (ESRD) patients.

Methods. The processes of SDM for RRT were designed with Internet-based patient educational program and smart system. The project of SDM was reviewed by departmental consensus meeting and continuously executed since January 2017. Patients received long-term RRT between January 2016 and December 2017 were enrolled.

Results. In 2017, 310 patients (187 male, average 63.9 years old) received long-term RRT. Of them, 220 (71%) patients completed SDM for RRT. Sixty-six patients received peritoneal dialysis (PD), 67 patients entered the evaluation of living related kidney transplantation (KT) program, while 18 patients finally received operation for living KT. Compared to 2016, execution of SDM for RRT was associated with drastically increase of the number of living KT (38.5%) and PD (112.9%) after the implementation of SDM for RRT in 2017. The number of preemptive living KT was also increased from 1 patient to 5 patients. Moreover, 91.3% patients were satisfied with the process of SDM for RRT.

Conclusion. Our findings suggest that the implementation of SDM before patients entering long term RRT lead to more ESRD patients receiving living KT and entering PD therapy. The increasing trend of living KT could be reasonably expected if SDM for RRT could be carried out nationwide.

MOST medical problems have more than 1 management options. However, patients and families usually lack the opportunity to fully understand their problems and even excluded from deciding how those problems are being managed. Joint commission of Taiwan, which is responsible for whole national hospital accreditation, encourages greater use of shared decision making (SDM) in health care since 2016. In SDM, the medical team offers treatment options, including their benefits, risks, medical expenses and copayment, helping patients to comprehensively understand and to make collaborative decision. By reaching the mutual

agreement, patients may feel less emotionally unprepared or being reluctant [1,2] and even have better treatment satisfaction [3].

In 2015, there were 77,920 patients underwent dialysis, and 70,985 patients (around 91%) received hemodialysis in

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Taiwan [4]. Many patients with end-stage renal disease (ESRD) were “suggested” to perform hemodialysis by their physicians. In general, the treatment modalities of ESRD include 3 major types of renal replacement therapy (RRT), such as kidney transplantation (KT), peritoneal dialysis (PD), and hemodialysis. Many newly diagnosed ESRD patients did not fully understand all available treatment options and even initiated dialysis without understanding the long-term implications of their decision. Beyond the lack of donor, poor knowledge of living kidney transplantation is a major barrier to patients receiving kidney transplantation [5]. Therefore, this study was designed to explore the distribution change of treatment modalities for ESRD before and after the use of SDM in patients who need long-term dialysis.

MATERIALS AND METHODS

Newly diagnosed ESRD patients who received long-term RRT between January 2016 and December 2017 were enrolled in our study. The treatment modalities of ESRD were identified after 12 months of entering long-term RRT. The processes of SDM for RRT were designed with the combination of Internet-based patient educational program and smart system, such as the eHIS order system, patient decision aids, QR code, and app. The project of SDM were reviewed by departmental consensus meeting and continuously executed since January 2017. When the patient’s renal function progresses to stage 5 chronic kidney disease (CKD), defined by eGFR < 15 mL/min/1.73 m², the attending physicians will initiate the SDM program by prescribing order of “SDM for RRT” in our eHIS order system. The licensed CKD educators will help physicians to execute SDM for RRT in the outpatient clinic and ward. The CKD educators will provide relevant information of

ESRD and introduce the modalities of RRT, including hemodialysis (HD), PD, KT, and palliative care if indicated, via multimedia and visual aids such as introduction videos and interactive games. If the patient did not reject or had no contraindication of PD or KT, the PD nurses or KT coordinator will then continue to help patients finish the evaluations of PD or KT accordingly. We used an interactive app of SDM for RRT with simple true-false questionnaire to help patients and families figuring out which treatment modalities might be suitable for them. After they finish the questionnaire and fill out their personal data at our website, the system will automatically present some suggestions to them and simultaneously send an e-mail to their attending physician. Finally, the satisfaction questionnaire of SDM for RRT was conducted after the process of SDM for RRT.

The endpoints of this present study include receiving the evaluation of living KT, receiving Living KT, receiving regular PD, or HD. We will compare the distribution change of treatment modalities for RRT between 2016 and 2017.

RESULTS

In total, 298 patients and 310 patients with newly diagnosed ESRD need long-term RRT were identified at our hospital in 2016 and 2017. Among 310 patients who receiving RRT in 2017, 220 (71%) patients completed SDM for RRT process. The mean age of these 220 ESRD patients was 64.9 years, 60% male. The levels of education were illiterate in 21 (9.5%) patients, elementary school in 63 (28.6%) patients, junior high school in 32 (14.6%) patients, senior high school in 53 (24.1%), and university or higher in 51 (23.2%) patients. Diabetes mellitus was found in 108 (49.0%) patients, hypertension in 180 (81.8%) patients, coronary arterial disease in 59 (26.8%) patients, and congestive heart disease in 62 (28.2%) patients (Table 1).

Table 1. Demographic and Clinical Characteristics in Patients Who Received SDM

Characteristic	Evaluation for LKT (n = 67)	Actual LKT (n = 18)	Actual PD (n = 66)	Entire Cohort (N = 220)
Age, years, median (IQR)	47.1 (32.8–57)	40.2 (31.8–50)	58.0 (47–69.5)	64.9 (53.0–74.3)
Male, n (%)	33 (49)	12 (66)	28 (42)	132 (60)
BMI, median (IQR)	24.4 (21.6–27.0)	24.9 (23.4–26.4)	24.80 (21.2–28.2)	24.17 (21.0–26.8)
Education				
Elementary school, n (%)	7 (10.4)	0 (0)	18 (27.3)	63 (28.6)
Junior high school, n (%)	15 (22.4)	1 (5.6)	6 (9.1)	32 (14.6)
Senior high school, n (%)	28 (41.8)	8 (44.4)	18 (27.3)	53 (24.1)
University, n (%)	17 (25.4)	9 (50)	24 (36.4)	51 (23.2)
Original disease				
Unknown, n (%)	24 (35.8)	6 (33.3)	30 (45.5)	49 (22.3)
DM, n (%)	11 (16.4)	1 (5.6)	22 (33.3)	84 (38.2)
GN, n (%)	21 (31.3)	6 (33.3)	8 (12.1)	40 (18.2)
CTIN, n (%)	3 (4.5)	1 (5.6)	2 (3.0)	13 (5.9)
Malignancy, n (%)	0 (0)	0 (0)	1 (1.5)	5 (2.3)
Obstructive, n (%)	0 (0)	0 (0)	0 (0)	6 (2.7)
Other, n (%)	8 (11.9)	4 (22.2)	4 (6.0)	23 (10.5)
Comorbidity				
DM, n (%)	13 (19.4)	3 (16.7)	28 (42.4)	108 (49.0)
HTN, n (%)	44 (65.7)	13 (72.2)	62 (93.9)	180 (81.8)
CAD, n (%)	6 (9.0)	1 (5.6)	14 (21.2)	59 (26.8)
CHF, n (%)	14 (20.9)	2 (11.1)	16 (24.2)	62 (28.2)

Abbreviations: BMI, body mass index; CAD, coronary artery disease; CHF, congestive heart failure; CTIN, chronic tubulointerstitial nephritis; DM, diabetes mellitus; GN, glomerulonephritis; HTN, hypertension; IQR, interquartile range; LKT, living kidney transplant; PD, peritoneal dialysis; SDM, shared decision making.

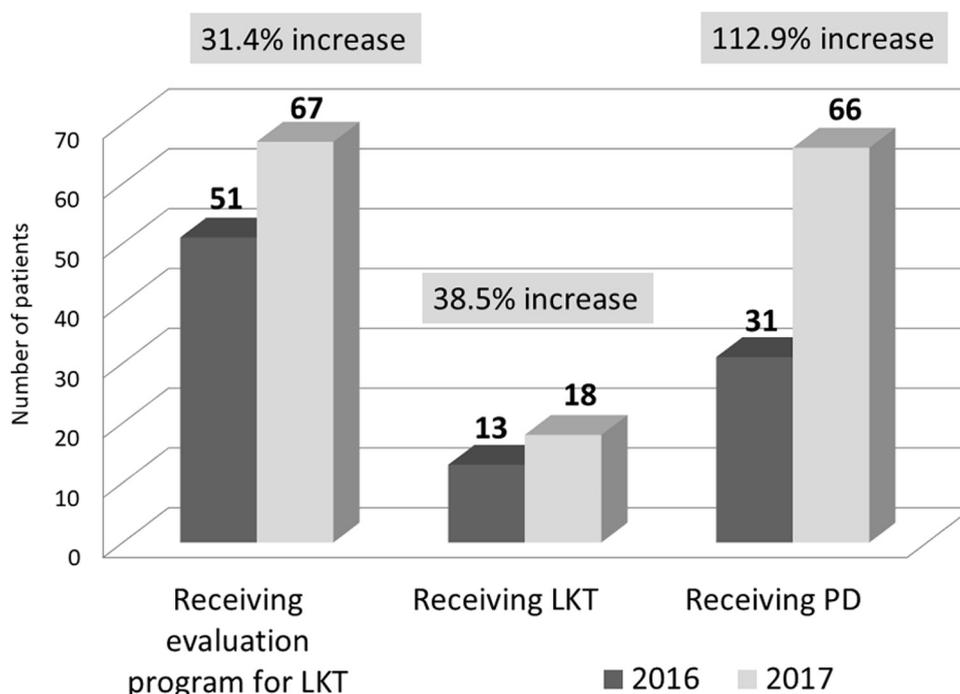


Fig 1. The distribution change of treatment modalities for patients with newly diagnosed end-stage renal disease. Abbreviations: LKT, living kidney transplantation; PD, peritoneal dialysis.

Overall, there were 66 ESRD patients received peritoneal dialysis, and 67 patients entered the evaluation of living related KT program while 18 patients finally received living KT within 1 year after the execution of SDM for RRT. The number of preemptive KT was also increased from 1 patient to 5 patients. Compared to 2016, execution of SDM for RRT was associated with 31.4% (51 patients in 2016) increase of patients received the evaluation program of living KT (Fig 1).

The execution of SDM for RRT was associated with a dramatically increase of patients receiving PD by 112.9%, from 31 patients in 2016 to 66 patients in 2017. Among those patients who received PD, 35 (53%) of them started PD without temporary hemodialysis, while 21.6% started in 2016. Importantly, 281 (91.3%) patients were satisfied with the process of SDM for RRT.

DISCUSSION

In this present study, near 29% ($n = 90$) of patient did not complete the SDM process. The main reasons were poor cognition ability with poor family support, inappropriate initiation of SDM by the medical team during admission, and the patients or families refuse further SDM intervention. Although the combination of a smart Internet system and multimedia may facilitate the accessibility of patient education, SDM for RRT is still a very time-consuming process. The ideal timing to initiate the SDM for RRT could be as early in stage 4 CKD or early stage 5 CKD,

instead of the beginning of emergent dialysis via temporary catheter. In our design, the process of SDM was initiated by the order of the attending physician. However, there was a high possibility that the medical team did not start the process immediately or even forgot to begin, especially when the medical team did not include a nephrologist. An automatic reminder system when detecting patients with ongoing or impending advanced stage renal disease could be helpful to increase the execution rate of SDM for RRT.

Among those 67 patients entering evaluation of living KT, only 18 (26.9%) patients passed the living KT evaluation, completed the verification of institutional review board, and successfully received the operation of living KT. In fact, the pass rate of living KT evaluation program is around 30% at this hospital in the past 10 years. Paired exchange program and desensitized protocol in highly sensitized patients may further increase the pass rate of living KT program.

There were challenges regarding organ transplantation. Lack of knowledge, the embarrassment between relatives, and most informed consent mainly focus on the procedure and attendant risks. SDM could facilitate more communication and create better relationships between patients, families, and medical team members. SDM of RRT could lead patients and families to have a better understanding of the risks and benefits of living kidney transplant donor and recipients.

The long-term survival rate of kidney transplant recipients in Taiwan is significant higher than dialysis patients, while the survival rate of PD patients is not inferior to HD

patients [4,6]. Similar to a previous report, the awareness of treatment modalities for ESRD by SDM for RRT actually changed the distribution of treatment modalities of RRT in this present study. Between 2005 and 2016, the living KT accounted for 23.7% to 39.4% of all KT in Taiwan [7]. Surprisingly, the implementation of SDM for RRT in Taiwan contribute to the increase of living KT; the ratio is about 50% in 2018.

In conclusion, the implementation of SDM before newly diagnosed ESRD patients entering long-term RRT lead to more patients receiving living KT and PD. The increasing trend of living KT could be reasonably expected if SDM for RRT could be carried out nationwide.

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