Kidney transplant nursing: a comparison of care demand between scales

Enfermagem no transplante renal: comparação da demanda de cuidado entre escalas
Enfermería en el trasplante renal: comparación de la demanda de cuidado entre turnos

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Abstract

Objective: To compare the number of hours of nursing care demand for patients in the postoperative period after kidney transplantation, using the Patient Classification System (SCP) and Nursing Activity Score (NAS) tools.

Methods: a prospective cohort study. The population consisted of patients who underwent deceased donor kidney transplantation at PUCRS São Lucas Hospital. Assessment was carried out from 6 to 24 hours in the immediate postoperative period, on the days following discharge from the Surgical ICU and on the 15th postoperative day or on the day of discharge (whichever occurred first).

Results: A total of 73 patients completed the study. The mean SCP in the first assessment was 31.6 (intermediate care), while in NAS the mean was 86.5% (intensive care). In the last assessment, the score found in the SCP was 15.5 (minimum care); In the NAS, the median was 50.1% (semi-intensive care). There were no significant differences when comparing the scores obtained at discharge from surgical ICU and discharge from hospital.

Conclusion: The findings of this study suggest that there is a difference between the number of hours of postoperative kidney transplant care demand when compared to the SCP and NAS tools, and this affects the type of care.

Resumo

Objetivo: Comparar o número de horas da demanda de cuidados de enfermagem ao paciente no pós-operatório de transplante renal, por meio dos instrumentos de Sistema de Classificação de Pacientes (SCP) e do Escore de Atividade de Enfermagem (NAS).

Métodos: Estudo de Coorte Prospectivo. A população foi composta pelos pacientes submetidos ao transplante renal com doador falecido no Hospital São Lucas da PUCRS, a avaliação ocorreu de 6 a 24 horas no pós-operatório imediato, nos dias subsequentes até a alta da UTI Cirúrgica e no 15º dia pós-operatório ou no dia da alta (o que tenha ocorrido primeiro).

Resultados: Completaram o estudo 73 pacientes, a média do SCP na primeira avaliação foi de 31,6 (cuidado intermediário), já no NAS a média foi de 86,5% (cuidado intensivo). Na última avaliação a pontuação encontrada no SCP foi de 15,5 (cuidado mínimo), no NAS a mediana foi de 50,1% (cuidado semi-intensivo). Não houve diferença significativa quando comparadas as pontuações obtidas na alta da UTI cirúrgica e na alta hospitalar.

Conclusão: Os achados deste estudo sugerem que há diferença entre o número de horas da demanda de cuidados ao transplantado renal no pós-operatório quando comparados os instrumentos SCP e NAS, e isso repercute também no tipo de cuidado.

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Conflicts of interest: nothing to declare.

Resumen

Objetivo: Comparar el número de horas de la demanda de cuidados de enfermería al paciente en posoperatorio de trasplante renal, por medio de los instrumentos de Sistema de Clasificación de Pacientes (SCP) y de la escala Nursing Activities Score (NAS).

Métodos: Estudio de cohorte prospectivo. La población fue formada por pacientes sometidos a trasplante renal con donante fallecido en el Hospital São Lucas de la universidad PUCRS. La evaluación se llevó a cabo de 6 a 24 horas en el posoperatorio inmediato, en los días subsiguientes hasta el alta de la UCI Quirúrgica y en el 15° día del posoperatorio o el día del alta (lo que haya sucedido primero).

Resultados: El estudio lo completaron 73 pacientes, el promedio del SCP en la primera evaluación fue 31,6 (cuidado intermedio) y en el NAS el promedio fue 86,5% (cuidado intensivo). En la última evaluación, la puntuación del SCP fue 15,5 (cuidado mínimo) y en el NAS la mediana fue 50,1% (cuidado semintensivo). No hubo diferencia significativa al comparar las valoraciones obtenidas en el alta de la UCI Quirúrgica y en el alta hospitalaria.

Conclusión: Los resultados de este estudio sugieren que hay diferencia entre el número de horas de la demanda de cuidados al trasplantado renal en el posoperatorio al comparar los instrumentos SCP y NAS, y eso repercute también en el tipo de cuidado.

Introduction

Noncommunicable chronic diseases cause numerous lifestyle changes, especially caused by the restrictions resulting from this diagnosis: therapeutic needs, clinical control, as well as the possibility of recurrent hospitalizations.[1,2] One of these is chronic kidney disease (CKD), which consists of abnormalities in the structure and/or function (glomerular, tubular and endocrine) of the kidneys, present for more than three months, with health implications.[3-6] According to the Brazilian Society of Nephrology Survey on CKD patients in 2016, there were around 130,000 people on renal replacement therapy (RRT) in Brazil, 92% of whom were on hemodialysis.[7]

It is up to the care team to offer the therapeutic modalities and to the patient and support network to make the choice, unless there is a contraindication for any modality. Taking into account the changes in the individual's personal life, and consequently the physical, psychological and daily damage that this choice will play.[8]

Kidney transplantation is a surgical procedure that involves the transfer of the healthy organ from one individual (donor) to another (recipient), in order to restore lost or ineffective functions. It is currently considered the best therapeutic option, both from a medical, social and economic point of view. When compared to hemodialysis, transplantation also improves long-term survival and represents a financial savings.[9]

Despite being an important therapeutic resource, this modality does not mean cure, but the possibility of a new perspective and a return to quality of life. It is a treatment that includes continuous medical follow-up, routine exams, use of permanent immunosuppressive medications and important adherence to established procedures.[10]

After kidney transplantation, in our institution, the recipient is referred to a Surgical Intensive Care Unit (ICU) in order to receive intensive care, but this patient has different characteristics of the profile of those hospitalized in this unit, because, most of them, after the surgical procedure and the anesthetic effect, will regains body physiological control and presents a quick recovery. Perhaps for this reason there is an underestimation of the care that must be taken into consideration when sizing the nursing staff for these patients, added to a lack of theoretical framework that justifies such sizing.

It should be noted that approximately 25% of deceased donor recipients will not have initial graft function and, consequently, need for temporary dialysis, 20% to 60% will have one or more episodes of acute rejection and will depend on an immunosuppression protocol and about 5% may develop some technical complication or need for surgical reintervention.[11] These complications are likely to occur in the surgical ICU, and rapid action may determine or modify graft and patient survival. Therefore, a careful assessment and care directed exclusively to this receptor can positively affect the results.

The management of patient care and staffing for patient care is a primary function of the nurse, either in the inpatient unit or in more complex units. Given this, there are criteria that must be rigorously analyzed. Currently, there are a variety of scales that can be used to assist in care management, assessing

the degree of dependence of patients, the severity and hours of care they require from staff.

Among the various existing scores to classify patients , the TISS, know by is acronym TISS-Therapeutic Intervention Scoring System,[12] was updated in 1983, [13] and restructured in 1996 to 28 items. TISS-28, where each point is equivalent to 10.6 minutes of the time spent for care. [14,15] It is based on the assumption that, regardless of the diagnosis, the more procedures needed, the greater the severity of the disease and, consequently, the longer the care provided by nursing.[16] This tool was translated and validated in Brazil in 2000.[17] However, it did not yet contemplate a series of activities performed by nursing. Seeking its improvement, it underwent a restructuring in 2001 and, despite reducing the number of items from 28 to 23, it now encompasses a larger set of nursing activities, and weights are attributed to these items. This new index was called the Nursing Activities Score (NAS).[18]

The NAS has the same therapeutic intervention categories as the TISS-28, but added in the category "basic activities" other nursing activities, which expresses the great change of assessment of this tool, considering not only the care tasks, but also the management and support to the critical patient's family member.

This tool has minimum score items ranging from 1.2% to 32%, and each point is equivalent to 14.4 minutes that, converted, represent how much in percentage of time the nurse spend in direct and indirect patient care. In a shift, ranging from zero to 176.8%, covering 80.8% of nursing activities.[19,20] It is considered the best tool to quantify the real workload, helping to improve the activities developed in the ICU and the team sizing.[21]

Another widely used tool is the Patient Classification System (SCP - *Sistema de Classificação de Pacientes*), which was built and validated in 1998 by Perroca and Gaidzinski. This scale aims to categorize patients according to the amount of nursing care required, i.e., based on the degree of patient dependence and need for care, which generally reflects the complexity of care required[22] it is divided into four categories (classes) and correspond to the type of care.

The Federal Council of Nursing,[23] through Resolution 543/2017, advises on the downsize of the staff, taking into account the characteristics of the health service, the nursing service and the patient. In this assessment, the degree of dependence should be analyzed according to the SCP.

There are a series of scores and assessments to assist determining the downsizing of the nursing staff. Thus ensuring a quality, efficient and effective care that represents a viable cost for the institutions. The nurse has the primary role in choosing the assessment method, in its execution, in the search and analysis of the results of it.

Therefore, the objective of this study was to compare the number of hours of nursing care demand to the patient in the postoperative period after kidney transplantation using the Patient Classification System (SCP - *Sistema de Classificação de Paciente*) tools and the Nursing Activity Score (NAS).

Methods

This is an observational prospective cohort study. The sample consisted of patients who underwent deceased donor kidney transplantation in a hospital in Porto Alegre, between October 2016 and August 2017, aged over 18 years. Patients who died and did not complete the study period ,those who remained in the Surgical ICU for seven days or more postoperatively and those who returned to the Intensive Care Unit during the period assessed were excluded.

Data collection was performed by completing the SCP[22] and NAS[19]. The responsible researcher and the surgical ICU nurse assessed the first patient included in the study simultaneously and the results compared for the investigator calibration. The scores for SCP and NAS were collected simultaneously at five different times. On day (D) 1, the first assessment occurred 6 to 24 hours after the recipient's arrival at the surgical ICU. Thus, subsequent assessments on subsequent days were named D2, D3 and D4, the maximum assessments performed in this unit occurring up to D4. The assessments of the two tools, contained in D5, refer to the day of discharge or the application of the tool on the 15th

day after transplantation, with the patient still in the inpatient unit.

Both scores were converted to hours of demand of care, and thus classified according to the time of care recommended by COFEN (Federal Nursing Board – *Conselho Federal de Enfermagem*) to be able to equalize the types of care and make a comparative analysis between the two instruments.

The Research Ethics Committee of *Pontifícia Universidade Católica* of the state of Rio Grande do Sul, protocol number 1,768,453, approved this study. By presenting only data that are compulsorily collected for the daily assessment of the patient, involving no risk and/or damage, as well as discomfort of the participant, the researcher undertook to maintain confidentiality with the data collected from the medical record (Term of Data Usage).

The results are presented as descriptive statistics, with estimates of measures of central tendency and variability, with the study of symmetry by the Kolmogorov Smirnov test. Regarding the categorical variables, the presentation occurred through the absolute and relative distributions.

In the comparison of continuous variables between the D1 and D5 (high) assessments, t-Student tests used for paired data. When the comparison took place on the categorical variables, the Friedmam and McNemar Browker tests were used.

The linearity relationship of High Surgical ICU and Hospital Discharge compared to discharge days occurred by Kruskal-Wallis correlation analysis.

Data were analyzed using the Statistical Package for Social Sciences, version 20.0 (SPSS Inc., Chicago, IL, USA, 2010) for Windows, and for the statistical decision criteria a significance level of 5% was adopted.

Results

Initially, 75 patients were assessed, but two recipients were excluded from the study, as they had to return to the ICU during the study period. There was a predominance of males, 59% (n=47), the minimum age was 18 years and the maximum was 84 years, with mean age of 49 ($\pm$ 15 years). Regarding

the time in RRT, the median was 26 months (minimum of 3 months and maximum of 240 months) and waiting list time of 18 months (minimum of 1 month and maximum of 144 months). The predominant dialytic method with 88% (n=64) was hemodialysis. Table 1 shows the values of the two scores in the different assessment days.

Table 2 presents data regarding the NAS related to the first assessment (surgical ICU) and the last assessment (hospital discharge).

Data regarding the Patient Classification System regarding the first assessment (surgical ICU) and the last assessment (hospital discharge) are presented in Table 3.

The initial assessment was performed with mean of 13.4 (+ 4.9) hours, and NAS mean score of 86.5%, which is equivalent to 20 hours and 46 minutes, this time defined as type of intensive care. Of the 73 patients assessed, the following items scored 100%: Laboratory investigations; Medications; Drain care; Treatment for improvement of pulmonary function (prescription and verification of respiratory physiotherapy); and Quantitative measurement of urine output, which are items that have a single score. These also had a maximum score in the Monitoring and Control item, as it was necessary within the immediate postoperative observation period for 4 hours or more, for safety reasons. In contrast, they obtained a minimum score on support and care items for family members and administrative and managerial tasks, since these activities are performed routinely, but do not require a time greater than two hours within the assessed period.

Regarding hygiene procedures, ten patients (14%) required more than two hours in this care within the assessed period. The remaining 63 (86%) achieved a minimum score, as they only needed to change the dressing, bedding and body hygiene, and no maximum score was observed in this item. Regarding mobilization and positioning, eight recipients (11%) required the assistance of two professionals for this care. For one patient (1.3%), it took three or more professionals to perform this task, the remaining 64 recipients (87.7%) had a minimum score. All recipients (100%) no longer needed respiratory support with endotracheal tube, but 16 of

Table 1. Descriptive measures for NAS and SCP tools at different assessment days during hospitalization in Surgical ICU

Tools and variables	Assessment Days											
	D1 (n=73)			D2(n=20)			D3(n=7)			D4(n=3)		
	Mean	SD	Median	Mean	SD	Median	Mean	SD	Median	Mean	SD	Median
Nursing Activity Score												
Score (%)	86.5	7.4	82.8	61.7	21.1	58.2	56.3	16.2	55.4	52.0	26.3	46.0
Conversion (min)	1245.8	107.2	1192.3	889.1	303.3	838.1	811.1	233.2	797.8	748.8	379.0	662.4
Time (h)	20:46	1:47	19:52	14:49	5:03	13:58	13:31	3:53	13:18	12:28	6:19	11:02
Type of care												
Semi-intensive					20.0% (n=4)			14.3% (n=1)			33.3% (n=1)	
Intensive		100.0% (n=73)			80.0% (n=16)			85.7% (n=6)			66.7% (n=2)	
Patient Classification System												
Score	31.6	3.8	31.0	27.1	5.1	25.0	26.0	5.4	25.0	22.3	2.3	21.0
Time of care												
Minimum		2.7% (n=2)			60.0% (n=12)			71.4% (n=5)			100.0% (n=3)	
Intermediate		92.0% (n=67)			40.0% (n=8)			28.6% (n=2)				
Semi-intensive		5.3% (n=4)										

Table 2. Descriptive measures for the recipient's Nursing Activity Score tool at D1 and D5 (discharge)

Variables	Assessment Days						
	D1 (n=73)			D5 (n=73)			P value
	Mean	SD	Median	Mean	SD	Median	
Score (%)	86.5	7.4	82.8	45.0	10.4	50.1	<0.001§
Conversation (min.)	1245.8	107.2	1192.3	647.5	149.2	721.4	<0.001§
Time (h)	20:46	1:47	19:52	10:48	2:29	12:01	<0.001§
Type of care							
Intermediate					16.4% (n=12)		
Semi-intensive					83.6% (n=61)		0.109 π
Intensive		100.0% (n=73)					

§: Student's t-test for paired data; π: McNemar Browkwe Test

Table 3. Descriptive measures for the receiver D1 and D5 Patient Discharge System (hospital discharge) tool

Variables	Assessment Days						
	D1 (n=73)			D5 (n=73)			P value
	Mean	SD	Median	Mean	SD	Median	
Score	31.6	3.8	31.0	15.5	1.8	15.0	<0.001§
Type of care							
Minimum		2.7% (n=2)			98.6% (n=72)		
Intermediate		92.0% (n=67)			1.4% (n=1)		<0.001 π
Semi-intensive		5.3% (n=4)					

§: Student's t-test for paired data; π: McNemar Browkwe Test

them (22%) still used supplemental oxygen (nasal cannula). Regarding the need for vasoactive drugs, eight patients (8.2%) were taking this medication during the first 24 hours, two transplanted patients (2.7%) needed intravenous replacement of large fluid losses and one recipient (1.3%) required cardiopulmonary resuscitation. About the performance of some dialytic technique, 26 assessed (36%) scored in this item and 42 patients (57%) needed to perform some diagnostic procedure outside the surgical ICU.

Regarding the SCP, in the initial assessment the mean score obtained was 31.7, which is equivalent to the mean 6-hour care, being defined as intermediate care. As this score considers the severity of the patient, the scores were very variable in each item and for each patient. However, there are three items that obtained the maximum score: control of vital signs at intervals shorter than two hours; effective nursing care for body care and comfort measures due to bed restriction; indwelling urinary catheter manipulation and control.

Of the patients who completed the study, 58 (79%) were discharged before the fifteenth day, with a median NAS score of 50.1%. It is equivalent to 12 hours and 1 minute of care demand (semi-intensive care), a higher score than patients who were assessed on the fifteenth day but still hospitalized (NAS=22.9% equivalent to 5 hours and 30 minutes - intermediate care).

Considering SCP, the mean score on discharge day was 15.5, that is, a care demand of up to 4 hours and equivalent to the minimum care. There was no difference in the score obtained, considering the days elapsed until hospital discharge. The subjects had a minimum score on the items, except for cutaneous-mucous integrity (mean 3.1), since all patients had a surgical incision.

Discussion

The profile of patients studied is similar to the profile of kidney transplant recipients in Brazil, according to the literature. Most of them were male recipients, as this is a predominant feature in CKD patients, with age equivalent to that found in the study.[10,24]

Regarding the time elapsed from the waiting list until transplantation, the mean was 1.6 years. This time is known to be variable and dependent on several factors, but the time found in this study was shorter than that described in the literature. According to Machado, Cherchiglia and Acurcio[25,26], in an analysis carried out in Belo Horizonte from 2000 to 2005, the mean was 2.2 years.

Statistics on RRT modalities in Brazil show that 91% of patients undergo hemodialysis.[27] In another analysis of the epidemiological profile of these patients, Cherchiglia and others find similar data, with peritoneal dialysis being the dialytic method of 11% of the Brazilian population, which is in agreement with the world scenario.[25] According to Sesso et al. (2017),[7] in the Brazilian Chronic Dialysis Survey in 2016, 92% of patients underwent hemodialysis and only 8% PD.

We did not find in the literature a similar study performed exclusively in the postoperative assessment of kidney transplantation, because of this fact the analysis was made taking into consideration research with patients already hospitalized and patients admitted to ICU. It is noteworthy that, because it is an evaluation score of this unit, also the assessment made in the inpatient unit serves as a basis for research and proposal for future attention to this indicator as there are no studies in the literature about the use of this score in these units.

In the initial assessment of the recipients, the NAS score was 86.5%, and this data is different from those found in the literature. According to a survey by Nogueira et al. (2013), the average found at ICU admission was 61.9% and 52.8% at discharge, our scores at the time of hospital discharge are in agreement with this value.[28]

Moving to a next analysis performed in an ICU, Gonçalves et al.[29] (2006) also found a similar value to that described above, with an mean of 66.5%. The highest score found of 75% was in the group of patients who died during the study. This data was similar to that found by Leite, Silva and Padilha,[30] where the mean score achieved in an ICU was 68.1%. It is worth noting that the items scored in this research were similar to those also listed in the present study. In another analysis, Feitosa, Leite and Silva[31] found an mean of 67.3% for a unit with the same profile as previously described.

These data lead us to reflect that the kidney transplant has a different profile from other ICU patients, but it demands a higher workload that, if not properly assessed, can quickly lead to an unfavorable development. Compared to patients considered to be highly dependent on a specific ward, kidney transplant recipients had a similar score, but at the time of hospital discharge, which is consistent with this study, according to Lima, Tsukamoto and Fugulin.[32] The mean score was 51.47% for the assessed.

As this tool has been validated for nursing care assessment for ICU patients or high-dependency units, there are no studies assessing the scores obtained in the inpatient unit. From the literature, it was possible to understand that patients in the postoperative period of renal transplantation require a high workload and care that this has been under-dimensioned in the assessed units.

Regarding the initial assessment of the SCP, the type of intermediate care prevailed in the population studied, and this data is similar to that found in an analysis performed in a specialized liver transplantation unit.[33] A difficulty found for the discussion of this tool in this study is the fact that the literature points to several studies that use the SCP, but with a view to personnel management and sizing, as this is the score recommended by COFEN

for distribution of the team even as a model for the construction of other tools. An analysis with the score at discharge was not possible.

It was also not possible to identify a correlation regarding the score obtained at surgical ICU discharge with length of stay and the score obtained at hospital discharge in both tools, as the correlation was not significant.

Conclusion

The findings of this study suggest that there is a difference between the number of hours of postoperative renal transplant care demand when compared to the SCP and NAS tools, and this also affects the type of care. It suggests that there is an underestimation in the SCP tool, since the time spent is much shorter than the NAS. There was no correlation regarding the score obtained in both tools at discharge from the surgical ICU with the length of hospital stay and, consequently, at discharge. It is important that further studies be conducted to determine effective and quality care aimed at safety, well-being, reducing hospitalization days, and the success of this treatment.

Collaborations

Kochhann DS, Figueiredo AE declare that they contributed to the project design, analysis and interpretation of the data, relevant critical review of the intellectual content and approval of the final version to be published.

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