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LITERATURE INTEGRATIVE REVIEW ARTICLE

INFECTIOUS COMPLICATIONS IN KIDNEY TRANSPLANT AND ITS IMPLICATIONS TO NURSING INTERVENTIONS: INTEGRATIVE REVIEW

COMPLICAÇÕES INFECCIOSAS NO TRANSPLANTE RENAL E SUAS IMPLICAÇÕES ÀS INTERVENÇÕES DE ENFERMAGEM: REVISÃO INTEGRATIVA

COMPLICACIONES INFECCIOSAS EN EL TRASPLANTE RENAL Y SUS IMPLICACIONES PARA INTERVENCIONES DE ENFERMERÍA: REVISIÓN INTEGRADORA

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ABSTRACT

Objective: to review the scientific literature on infectious complications in renal transplant patients and their implications for nursing interventions. **Method:** integrative literature review that aimed to answer the following question: 'What are the main infectious complications in renal transplantation and its implications for nursing interventions?' Searches were conducted in the databases LILACS, SciELO and PubMed from January 2001 to February 2011. We used an instrument considered complete reference of the journal, descriptors, objectives, methods, and study subjects, a period of infectious complications, results and conclusions. **Results:** initially it was found that after reading 341 articles resulted in a sample of 16 articles that met the inclusion criteria. **Conclusion:** infectious complications in these patients are commonly associated with invasive procedures and the use of immunosuppressive drugs, the wanted constitute important risk factors to be observed. **Descriptors:** Kidney Transplant; Infection; Nursing Care; Nursing Process.

RESUMO

Objetivo: analisar a produção científica sobre complicações infecciosas em pacientes transplantados renais e suas implicações para as intervenções de enfermagem. **Método:** revisão integrativa da literatura que buscou responder a seguinte questão: *Quais são as principais complicações infecciosas no transplante renal e suas implicações para as intervenções de enfermagem?* As buscas foram realizadas nas bases de dados LILACS, Scielo e PubMed no período de janeiro de 2001 a fevereiro de 2011. Utilizou-se um instrumento que considerava referência completa do periódico, descritores, objetivos, método, sujeitos do estudo, período da complicação infecciosa, resultados e conclusões. **Resultados:** inicialmente encontrou-se 341 artigos que após leitura resultou em uma amostra de 16 artigos que atenderam aos critérios de inclusão. **Conclusão:** as complicações infecciosas nestes pacientes estão comumente associadas aos procedimentos invasivos e ao uso de medicamentos imunossupressores, os quais se constituem em fatores de risco importantes a serem observados. **Descritores:** Transplante de Rim; Infecção; Cuidados de Enfermagem; Processos de Enfermagem.

RESUMEN

Objetivo: revisar la literatura científica sobre las complicaciones infecciosas en pacientes trasplantados renales y sus implicaciones para las intervenciones de enfermería. **Método:** revisión integradora de la literatura que tenía como objetivo responder a la siguiente pregunta: *¿Cuáles son las principales complicaciones infecciosas en el trasplante renal y sus implicaciones para las intervenciones de enfermería?* Las búsquedas se realizaron en las bases de datos LILACS, SciELO y PubMed desde enero 2001 hasta febrero de 2011. Se utilizó un instrumento considerado de referencia completa de la revista, descriptors, los objetivos, los métodos, los sujetos de estudio, un período de complicaciones infecciosas, resultados y conclusiones. **Resultados:** inicialmente se encontró que después de leer artículos 341 resultó en una muestra de 16 artículos que cumplían los criterios de inclusión. **Conclusión:** las complicaciones infecciosas en estos pacientes se asocia comúnmente con los procedimientos invasivos y el uso de fármacos inmunosupresores, la deseada constituyen factores de riesgo importantes que deben observarse. **Descriptor:** Trasplante Renal; Infección; Los Cuidados de Enfermería; Proceso de Enfermería.

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INTRODUCTION

Kidney transplantation is a surgical procedure that involves the transfer of a healthy kidney from one person to another with end-stage renal disease (ESRD). The goal is to compensate or replace function that the diseased organ can no longer play. This can occur with living donor or corpse.^{1,2}

Brazil is the second country in the world in kidney transplants.³ Kidney transplantation data show that in 2010, 4630 kidney transplants were performed in Brazil and 399 in Rio Grande do Sul (RS). The Brazilian Association of Organ Transplantation in 2011 reported that in the period January-March 1066 transplants were performed in Brazil and 90 in RS.¹

Renal transplantation is the most cost effective for the treatment of ESRD. The average cost to the patient on hemodialysis for years is ten times greater than treatment with transplantation, including the cost imunossupressores.⁴ However, renal transplantation is the definitive cure because the patient will require care for the rest of his life, which involves acquiring knowledge to recognize risk factors and signs and symptoms related to major complications to which it is exposed, such as infections and organ rejection.⁵

Infectious complications are a cause of morbidity and mortality in patients after renal transplantation,⁶ and continued use of immunosuppressants can be directly related to the incidence and severity of them, especially in the early post-transplant period.⁷⁻⁸

These frequent complications indicate the need to better know them, prevent them and treat them. Thus, the nursing interventions also need to be qualified because the transplant patient will need to follow the rest of his life. The nurse, with the patient, family and interdisciplinary team, will need to be alert to risk factors and factors related to the infection to diagnose problem situations, plan and implement specific interventions and evaluate the progress of each case.

Facing this, we identified the need to increase knowledge on this subject to subsidize nursing care to these patients, using available literature and obtaining grants to implement standards that may qualify the nursing interventions and reduce complications of renal transplantation. Soon, a literature review was conducted with the objective of analyzing the scientific literature on the major infectious complications in renal

transplant patients and its implications to nursing interventions.

METHOD

This is an integrative literature review, which consists of the analysis of studies on a scientific topic. This method is developed in the following stages: establishing the research question, literature review, categorization of studies, evaluation studies, data interpretation and synthesis of knowledge.⁹

In this study, the research question was: What are the main infectious complications in renal transplantation and its implications for nursing interventions?

For research, we consulted the databases PubMed, LILACS and SciELO.

To collect the data from the articles used an instrument that considered complete reference of the journal, descriptors, objectives, methods, and study subjects, a period of infectious complications, results and conclusions.

We considered studies published in English, Portuguese and Spanish from January 2001 to February 2011. The descriptors used were: kidney transplant, postoperative complications, nursing care, nursing and infection in different combinations. Inclusion criteria were: studies on patients undergoing renal transplantation infectious complications that occurred within one year after renal transplantation and is fully available online. Studies were excluded, although they appear in the databases, did not meet the objectives of this study. We also excluded articles multiple organ transplant.

A critical analysis of the included studies was based in accordance with the objectives of this research that investigates the major infectious complications in renal transplantation and its implications for nursing interventions. The initial search resulted in 341 articles, of which 275 in the database PubMed, 55 in LILACS and 11 in Scielo. After reading the titles and available abstracts, 50 articles were selected and read in its entirety. Of these, 34 were excluded because they did not meet the inclusion criteria of the study. The final sample consisted of 16 articles, which were evaluated, interpreted and summarized in a database as the title, database, and level of evidence, descriptors, objectives, method, and period of complication, the study subjects, and results conclusions. Were also categorized on the subject, considering the focus and research question.

The ethical aspects were respected, since all authors consulted are mentioned in the text.

RESULTS

The initial analysis of the 16 articles was organized considering the method, year of

publication, journal and level of evidence. Half of the articles in this review are case studies, only one randomized study. Ten (62.5%) articles were published from 2001 to 2005 and 14 (87.5%) were published in international journals (Table 1).

Table 1. An analysis of the articles about the method, year of publication, journal and level of evidence.

Methodology	Year of publication	Brazilian journal	International journal	Level of evidence	n
Case Study				5	8
	2001-2005	1	5		6
	2006-2011	0	2		2
Retrospective				4	4
	2001-2005	0	3		3
	2006-2011	1	0		1
Cross-sectional				4	2
	2001-2005	0	1		1
	2006-2011	0	1		1
Prospective				4	1
	2001-2005	0	0		0
	2006-2011	0	1		1
Randomized				2	1
	2001-2005	0	0		0
	2006-2011	0	1		1
Total		2	14		16

Infectious complications were categorized as to the site of infection, infectious agent and number of infections. The most prevalent infection was the urinary tract infections (Escherichia coli), followed by systemic (Cytomegalovirus), surgical wound (one case / infectious agent) and bloodstream (an event / infectious agent) (Table 2).

Table 2. Infectious complications, etiologic agent and site of infection.

Site of infeccion	Infeccious agent	n	(%)
Urinary tract (n=17)	- Escherichia coli	4	23,53
	- Klebsiella pneumoniae	2	11,77
	- Pseudomonas aeruginosa	2	5,88
	- Proteus	1	5,88
	- Enterococcus spp	1	5,88
	-Enterobacteriaceae	1	5,88
	- Micrococcus	1	5,88
	- Enterecoccus faecalis	1	5,88
	- Enterobacter sp	1	5,88
	- Penicillium sp	1	5,88
	- Cândida albicans	2	11,77
Systemic (n=14)	- Streptococcus pneumoniae	1	7,1
	- Mycoplasma hominis	1	7,1
	- Cytomegalovirus	6	42,9
	- Varicela-zoster	1	7,1
	- Parvovirus B-19	1	7,1
	- Escherichia coli	1	7,1
	- Staphylococcus coagulase negativa	1	7,1
	- Enterobacter sp	1	7,1
	- Acinetobacter baumannii	1	7,1
	- Staphylococcus aureus	1	7,1
Surgical wound (n=7)	- Pseudomonas aeruginosa	1	14,3
	- Staphylococcus aureus	1	14,3
	- Nocardia nova	1	14,3
	- Staphylococcus aureus	1	14,3
	- Enterobacter sp	1	14,3
	- Enterococcus	1	14,3
	- Scedosporium prolificans	1	14,3
Respiratory tract (n=5)	- Staphylococcus coagulase negativa	1	20
	- Pseudomonas aeruginosa	1	20
	- Pneumocystis carinii	1	20
	- Mycobacterium tuberculosis	1	20
	- Cytomegalovirus	1	20
Oropharyngeal Mucosa (n=2)	- Cândida	1	50
	- HSV-1	1	50
Gastrointestinal (n=1)	- Cytomegalovirus	1	100
Renal (n=1)	- Ordem Mucorales	1	100
Genital (n=1)	- HSV-2	1	100
Not defined (n=4)	- Samonella typhi	1	25
	- Cytomegalovirus	1	25
	- HSV	1	25
	- HHV-6	1	25

The analyzed articles do not show in the text the description of how infectious complications after renal transplantation may involve directly in the nursing interventions. However, considering the literature and

clinical practice,¹⁰⁻¹ we found significant evidence^{5-6,12-3,15,16-25} that translate human responses about the complications presented and that may lead to nursing interventions (Table 3).

Table 3. Clinical evidences and complications identified in the studies.

Clinical Evidence/Complications	n	%
Immunosuppression	12	75
Use of antibiotic	7	43,75
Surgical wound	5	31,25
Graft rejection	5	31,25
Preparation and collection of samples	4	25
Changes of glucose	3	18,75
Cutaneous manifestations	3	18,75
Use of urinary catheter	2	12,5
Use of antifungal	2	12,5
Hyperthermia	2	12,5
Changes in blood pressure	2	12,5
Nausea and vomiting	1	6,25
Peripheral Edema	1	6,25
Use of ureteral stent	1	6,25
Blood transfusion	1	6,25
Anemia	1	6,25

DISCUSSION

Most studies in this review are published in international journals with research design considered low level of evidence, with only one randomized study.²⁶ It is believed that the difficulty in the design and execution of studies of higher level of evidence is the main reason for its scarcity. There is a predominance of case studies, which are simpler and can be rapidly developed, based solely on individual clinical evidence.²⁶ In the last five years have seen a reduction in the number of publications about kidney transplantation despite the great progress that has happened in this area. This may be related to the fact that currently there were more multiple organ transplants, which generated studies that were not part of this research.

In relation to infectious complications were observed prevalence of infection of the urinary tract, since this is the system from the body with greater involvement in this operation.¹² The habitual use of urinary catheter after the procedure also predisposes the patient to infectious events, and other invasive procedures are necessary.²⁷

Systemic infections were reported as infections related mainly to the use of immunosuppressants used to prevent rejection of renal allograft.^{13,14} The use of immunosuppressants is also related with respiratory tract infection, since the patient's immunity is involved.²⁷

A wound infection is related to the fact that the patient had suffered a mechanical trauma (surgery) and be with the primary defenses damaged, added to the fact that the patient be with low immunity, drug use and

being in the hospital, where the risk of infection is high.^{15,28}

Other clinical evidence regarding the use of drugs (immunosuppressants, antibiotics and antifungals), cutaneous manifestations, signs and symptoms of graft rejection, invasive procedures, changes in vital signs, change in blood glucose, nausea and vomiting, and peripheral edema indicate the need clinical judgment of the nurse for the health problems of the actual or potential kidney transplant patients to establish a nursing diagnosis (ND) accurate, to support nursing interventions to be planned and executed.

These clinical evidences and the high risk for complications identified in the analyzed studies involving directly in the way that will develop the nursing activities. These should be based on a ND appropriate to each case and, according to the literature, the most commonly observed are Risk for Infection and Ineffective Protection.^{5,29,30}

The ND Risk for Infection is based on risk factors that contribute to increased vulnerability of the person. It is defined as at increased risk for being invaded by pathogenic organisms, and among the risk factors for kidney transplant patients using immunosuppressants, antibiotics and antifungals. Other important risk factors are invasive procedures such as the use of urinary catheters, central venous catheter and the wound itself.^{5,29,30}

The ND Ineffective Protection is supported by signs and symptoms that are meeting standards of evidence or inferences. It is defined as a decreased in the ability to guard self from internal or external threats such as illness or injury.²⁸

Based on risk factors and clinical evidences, the nurse diagnoses and plans of nursing intervention. For this, he may appeal to many nursing interventions described by the Nursing Interventions Classification - NIC.¹¹

Among the interventions identified as priorities by the NIC for patients with ND Risk for Infection are: Infection Protection and Infection Control who have numerous activities to prevent, detect or minimize the acquisition and transmission of infectious agents.¹¹ This can be done by monitoring systemic signs and symptoms of local infection, control tests, limiting the number of visits for the patient, assess and monitor the condition of the wound and also by intense control in all aseptic procedures.

Added to other interventions mentioned previously can also be implemented, given the high risk of these patients developing infections. Among them, the need for Nutrition Management and Environmental Management, Wound Care, Positioning, Medication Management, Respiratory Monitoring, Exercise Promotion, Skin Surveillance and Teaching: Disease Process.¹¹ These nursing interventions are extremely important to predict, detect and manage potential complications, ensuring the success of the transplant.³⁰

Among the priority interventions made by the NIC for patients with ND Ineffective Protection are also Infection Protection and Infection Control, similar to that proposed for the ND Risk for Infection. However, other interventions can also be implemented for patients with this ND, such as Nutrition Management, Wound Care, Positioning, Skin Surveillance, Risk Identification, and Surgical Precautions and Bleeding Precautions.¹¹

For changes in blood pressure and hyperthermia is crucial intervention Vital Signs Monitoring and changes for glucose is important the Hypo/Hyperglycemia Management. Moreover, it may necessary these nursing interventions Nausea Management, Vomiting and Electrolytes Management.¹¹

CONCLUSION

The main and most frequent infectious complications identified in the analyzed studies on kidney transplant patients are urinary tract infection, systemic and surgical wound. Immunosuppressive drugs and invasive procedures are the factors most commonly associated with them. Consequently, to promote, maintain and restore patient health nurses should strive for accurate diagnoses

based on clinical evidence and risk factors in order to promote best practices in a safe environment and reduce the patient's exposure to complications.

The articles analyzed revealed a gap in knowledge related to specific nursing interventions. This indicates the need for research in this area, in order to deepen the knowledge to support clinical practice in the care of kidney transplant patients.

The limitation for the execution of this study was the difficulty of access to some texts in their entirety, especially the international ones, which reduced the sample size.

As implications for nursing practice observed the existence of various clinical evidences favoring the diagnostic accuracy can support best practices. Additionally, the multidisciplinary team should be prepared to discuss and implement practices in a safe environment, reducing patient exposure to infectious complications.

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