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Care of the organ transplant receiver: Review

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Abstract

Organ transplantation is the process of replacing damaged/inoperative organs with healthy ones. Many parameters are considered in the decision-making process for this procedure. At first, compatibility parameters of the recipient individual and the donor should be evaluated. All laboratory values and tissue compatibility tests should be compared. The organ transplant coordinator shares the patient's compliance information with the team. The recipient patient is informed of the match, and the process begins. Preparing the recipient for transplantation is as difficult as finding the appropriate organ. During the first stages, the individual is evaluated and meets with the entire transplant team. Everyone on the transplant team explains their roles and responsibilities. The patient can ask questions. Information is given about complications and negative care processes encountered after transplantation. Patients most often experience differences of opinion in religious and cultural dimensions. On the one hand, he/she wants to live; on the other hand, he/she thinks transplantation is a "sin". These confusing thoughts can increase and be replaced by psychosocial issues. The transplant nurse initiates the patient's rehabilitation process. This process is based on an immunosuppressive treatment plan to strengthen the patient's immunity before transplantation. The transplantation plan provides guidance on transplant day, donor patient preparation, and organ safety. This review serves as a guide for recipient individual. This review study consists of specific sub-titles related to the subject.

Keywords: Organ transplant, Nursing care, Peri-operative care, Organ recipient

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Introduction

Organ transplantation is a known treatment method for replacing a non-functioning organ and is used in both developed and developing countries. It is accepted as the removal of damaged organs from the body and replacement with healthy organs. The specialization in this is context handled in nursing care. Since the nursing profession requires a patient-oriented study, all patients receive nursing care. A holistic approach taken by organ transplant patients is important to patient care. All applications bind to a certain protocol. A professional transplant nurse observes the patient's physiological parameters before the patient undergoes organ transplantation. The nurse reports observations and takes precautions against complications and possible rejections that may occur after surgery. This study was carried out to address the lack of an adequate supply of resources for the care of organ recipient patients. The study acts as a guide. Organ transplantation is performed to cure a recipient patient. Thus, a holistic view of the patient is required. The aim such care is to improve the quality of life of the organ recipient in the pre-operative period. For this, a holistic approach is used to develop a specific care plan for activities [1, 2].

Scientific questions

• Do surgical nurses of the transplant patient provide symptomatic treatment or traditional care?

• What is the order of priorities for surgical nurses while caring for patients who are undergoing immunosuppressive treatment?

Type and purpose of the study

These study data were written as a traditional review by scanning the relevant literature. In the literature review, transplantation patients are mentioned as general surgery patients. Nursing services should always provide personal and holistic care. Transplant patients should be separated into donor and recipient care groups because the procedure for the two patients is not the same. Since an organ was removed from one and placed into another individual, the required care for the two individuals is not the same.

Religious and intercultural ethical dimensions in organ transplantation

Organs taken from both living and deceased individuals have always been analyzed. Cultural differences in terms of transplantation process exist [4]. Whether organ transplantation is permissible and its effects on the hereafter are also debated [5]. This topic is confusing not only for those who belong to the religion of Islam but also for other religions. No matter how the clergy speaks on this issue, it is not easy to overthrow the old teachings [6, 7].

While our religion encourages us to donate, people can say "no" to organ donation [8–10]. Such a strict stance against organ donation is not a religious belief but rather represents conservatism. This attitude reveals the differences in belief between cultures. The ethical dimension also affects the way of perception and legal regulations [1].

The process of organ donation was performed in Christian communities living in America and Europe. "In eternity we will neither have nor need our bodies: old things will pass, all will be renewed" [11]. According to this belief, they know that nothing can come between God and his servant even after death [6, 11]. The sect known as Jehovah"s Witnesses is different from conventional Christianity. The problem with organ transplants is that Jehovah's Witnesses refuse to receive a blood transfusion although all dialysis infusions, plasma exchange, and administration of albumin, and coagulation factors are allowed [6, 11]. According to Jehovah's Witnesses, God forbids taking another person's organ. This view changed in the 1980s as "transplantation can do without blood transfusion" [6, 7]; however, organ transplantation is not possible without blood transfusions [6].

Since brain death is not accepted in Buddhism, organ transplantation is not accepted. Organs believed to have died with their previous owner are thought to be of no use to anyone else [6–11].

Recipient immunology

Precautions should be taken to prevent organ rejection before organ transplantation. Thus, the chance of success increases. Some tests need to be performed between the donor and the recipient to ensure the acceptance of the organ by the recipient's body. Various tests are used to examine organ compatibility between the recipient and the donor. The first of these tests is performed to determine the blood group. Cross-matching, human leukocyte antigen (HLA) tissue type screening, and anti-HLA antibody tests are among the group of tests. Also, in the pre-transplant tests, the levels of Scd30 and C4d should be monitored before and after the operation. These values indicate organ acceptance/rejection and allows us to determine whether the body accepts the organ or if complications develop [7, 12].

Blood group incompatibility causes tissue rejection [13]. However, in critical cases, some measures can be taken at an antibody level between 1/8 and 1/16, and transplantation can then be done [12].

HLA tissue types are viewed in two ways. In the serology test, lymphocytes are placed on different types of antibody-coated tissue. Tissue type is determined according to lymphocyte death. The molecular method and the polymerase chain reaction (PCR) tests are used together. Tissue compatibility is checked when these tests are used together [14].

The anti-HLA antibody test is a four-stage review method. First, a complement-dependent cytotoxicity (CDC) test with serology is performed and indicates the danger of hyperacute excretion; however, it is not very reliable. The amount of antibodies that will pass from the donor to the recipient can be calculated by flow cytometry [15, 16]. The enzyme -linked immunosorbent assay (ELISA) test is sensitive enough to detect low levels of IgG antibodies. It is more reliable and faster. Also, with the cross-match test, the donor's lymphocytes are compared with the recipient's serum. The flow cytometer can also detect previously undetectable antibodies [14]. If both the serological method and ELISA tests are positive, transplantation is not performed. If T-lymphocyte positivity is found regardless of pother parameters, transplantation should also not be performed [12, 14, 18].

Three main reasons why the recipient remains unresponsive exist, namely, antigen, cytokine, and transplantation tolerance. As a result of these factors, predetermined immunosuppressive treatment is planned, and post-transplant

organ rejection complications can be minimized. The immuno-therapeutic approach is initiated earlier is to adapt to the steps of the process [7, 12].

Antigen, cytokine, and other complex mechanisms should readjust after precautions are taken before transplantation. The regeneration time and pathogen parameters of the allograft should improve as a result of these actions [14]. Immune responses show rapid recovery.

Organ Conservation Protocol

The basic aim of organ protection is to prevent organ damage and loss of function. Organs can be stored for a long time using a simple hypothermic method, which is used as a precaution against adverse situations. Organs can be stored using this method according to their tissue and structure characteristics. Heart and lung can stay viable for 4 to 6 h, kidney 18 to 36 h, liver 12 to 18 h, and pancreas up to 12 h [14, 19].

Basic principles for proper preservation of the organ:

• Hypothermia: Hypothermia is used to reduce cell edema and slow down enzyme destruction. The simplest method is to wash the organ with a cold solution (4 ºC) and transfer it to a sterile organ bag. A cold chain must ensure. In another method, the organ is placed in a device and perfused until it reaches the recipient. Thus, the function of the vessels is preserved. The ischemia time of the organ increases using these methods; thus, they allow the organ to remain viable for a longer time. It is a very safe method [20, 21].

• Prevention of Intracellular Acidosis: Using the right solution for perfusion prevents tissue damage. Ringer's lactate is one such solution. Various solutions were developed later [20, 21].

*Eurocollins Solution; forms crystalline precipitates above the solubility of magnesium phosphate. Magnesium is extracted from this solution and made compatible with the organ.

*UW (University of Wisconsin) Solution. This solution provides the best hepatic protection. Cold increases the ischemia time at least 2–3 times [20, 21].

*HTK (Custodial, Bretschneider) Solution. It is cardioplegia (Perfect tamponade). It can be used for kidneys, livers, and pancreases and is low-cost [14].

*Celsior Solution; It is the only extracellular solution with low potassium [20].

*Low potassium dextran (LPD); its use is increasing at present [22].

• Transport: The organ should be packed. It is placed in a 3-stage sterile organ bag. The organ is placed in the first bag with enough physiological cold (4 ºC) solution. The amount of solution added to the bag is important and should be such that the organ does not come into contact with cooling elements or crushed ice. The first bag is placed in the second bag containing the cold solution. The second bag is then placed in the third organ bag, which is empty and is the outermost bag. These bags should be sterile and sealed [22].

Labeling and container placement after organ packaging is also very important. On the organ carrying bag/container, the "HANDLE WİTH CARE. HUMAN ORGAN" label must be affixed. Date, time, hospital, organ type, organ side, donor information, institutions, and addresses should be reported. Waterproof filing should be supplied. This prepared file should be added to the recipient's file [14].

The transplant coordinator organizes everything for organ removal and transfer. More than one organ can be transferred at the same time. In this case, a delay in processing time should be considered [21].

Precautions to be taken against complications and psychosocial statuses

Different psychosocial statuses are similar in all organs and systems as they represent a common background for all patients [23, 24]. However, although complications vary, infection, bleeding, thrombosis, and rejection are the most common ones [14].

- **Bleeding:** Bleeding is a complication resulting from different reasons specific to each organ. For example, it may be due to undetected trauma during nephrectomy for a kidney transplant for which early repair is possible. Necrotic leaks due to infection at the distal or proximal end of the anastomosis may ocur, and bleeding may occur with the development of an aneurysm [28]. Liver-related hemorrhaging is generally seen on the entire surface. Fresh frozen plasma and platelets are administered to stop bleeding. However, it should be known that these agents can increase the coagulation factor. Gastrointestinal system organ transplant bleeding is generally related to rejection and infection. Necrosis can be seen in four anastomoses performed in whole heart transplantation. Cutting the recipient distal to the removed heart vessels entails grafting, which prolongs the procedure time for the heart, a process that needs to be performed within 4 h. A technical error in the procedure can cause prolonged bleeding [25].
- **Infection:** It is an important step to interrupt resistance to the transplant via the use of immunosuppressive therapy. This step is done to prevent the development of infection in the organ after transplantation. In the first month after transplantation, an infection may occur in the lung, surgical wound, and urinary system. Opportunistic microorganisms that can develop within 1-6 months, including cytomegalo virus (CMV), Epstein-Barr Virus (EBV), herpes virus (HSV), hepatitis, non-cardiac, toxoplasma, and Listeria fungi, and pneumonia types. To reduce the risk of hospital infections, prophylactic immunotherapy is started. Skin integrity must be preserved. Fluid-electrolyte balance is checked at least twice a day [26].
- **Thrombosis:** Arterial thrombosis is usually associated with hypercoagulation. Slowing of blood flow in arteries and veins develops due to shrinkage and fracture of blood vessels. Microsurgery is used in liver transplantation to reduce the incidence of hepatic artery thrombosis [25].
- **Rejection:** Rejection is defined as the body's rejection of an organ or tissue that it considers foreign to itself. Organ rejection is the most serious and irreversible complication. Through immunosuppressive therapy, immunity can be strengthened. With this treatment, recovery is maintained to prevent post-operative organ rejection [27, 28]. Rejection can be hyperacute, acute, or chronic. Hyperacute manifests itself in the first 48 hours. Acute occurs within 1-5 hours and is seen during the week after transplantation surgery. Chronic rejection is seen in the first six months. After transplantation, a decrease in the amount of urine occurs. Symptoms, such as fever, hypertension, weight gain, increased organ size, increased organ sensitivity, and decreased

platelet number, suggest the presence of infection, which subsequently suggests organ rejection [29].

Table 1 includes the important causes of rejection of the heart, kidney, and liver.

- **Psychosocial problems:** With the increasing need for transplantation, medical parameters are not the only criteria. Psychosocial assessment has also become an important criterion since pre-transplant psychosocial problems will continue after transplantation [30]. According to the Stanford Integrated Psychosocial Assessment for Transplantation (SIPAT) scale, physical status is not the only adequate parameter to choose a transplant person. The psychosocial status of the patient should also be considered because stress management in the recovery process is the most important part of pre- and post-transplant care [14, 30, 31].

Table 2 includes risk factors within the scope of Stanford Integrated Psychosocial Assessment for Transplantation.

Role and Responsibility of the Transplant Nurse

A transplant nurse is a trained caregiver. He/she manages follow-up and treatment after the patient has been admitted. This nurse provides team organization to improve the quality of service and also has various roles [14]:

- Leadership
- Use and delegation of resources
- Leveraging evidence-based practice and research
- Compliance with ethical rules
- Ensuring cooperation among the whole team
- Education and training
- Evaluating the contribution of professional practices to the healing process
- Managing maintenance

Organ transplant nurses have served under the name of "coordinator" in recent years, namely, clinical care coordinator, care coordination, and advanced clinical care coordinator [3].

· *Clinical Care Coordinator*

The task of the coordinator involves pre- and post-transplant education of the patient and his family [14].

· *Maintenance Coordination Coordinator*

For direct or indirect maintenance, planning is made and team members are directed. By managing time, this coordinator ensures the synchronous progress of the transplantation. He/she is an educator, advocate, and consultant and has analytical skills. He/she makes quick decisions and is experienced in the transplant field [14].

· *Advanced Clinical Care Nurse Coordinator*

These coordinators are nurses who have completed their education at a master's or doctoral level. This person takes precautions for acute and chronic problems that may develop. Nurses with the same training in the United States are known as nurse practitioners. These nurses are authorized to prescribe medication and diagnose medical issues. They work as organizers in Turkey. We have nurses in Turkey who receive such training and manage difficult cases. For this reason, these nurses should have the authority to diagnose and administer drugs, such as the nurses in developed countries do because it is a very special unit considering its working potential. Transplant surgery should no longer be considered a sub-branch but rather its own field [3].

Transplant recipient education

Patient education for the transplant recipient should be patient-centered. A holistic approach, which is an important principle of nursing, is applied to the patient. This training begins before transplant process and continues with the post-transplant discharge and home care processes [32]. The purpose of this training is to manage the recipient's stress throughout the transplant process. The recipient should know beforehand the risks he will face [33, 34].

Pre-Transplantation

✓ The patient is admitted to the transplant center. Necessary isolation stages are enacted. Visiting restrictions and their importance are explained. Information about the duration of the operation is given.

✓ Training materials and methods should be chosen (assessment, difficulties, support systems, and others).

✓ Information is given about organ rejection. The patient is alerted to such a possible situation.

✓ The patient is allowed to express his or her feelings.

✓ Post-operative deep breathing exercises, use of spirometer, in- and out-of-bed exercises are taught.

✓ The intensive care process is planned according to the type of transplant. This process describes the length of stay in the intensive care unit (ICU), pain management, intravenous arterial cannulas, drains, and the early Ambu procedure.

✓ Before the operation, the patient is reminded to bathe.

✓ On the morning of the operation, surgical gown, and bonnet are put on the patient, and he/she is transported to the operating room along with his/her medical file [3].

Post-Transplantation

✓ Confidentiality is respected.

✓ Necessary safety precautions are taken in the room to minimize the risk of falling.

✓ The intensive care period last 1 to 3 days, the clinical period for 7 to 12 days, and then the home care period begins. Thus, the patient is given the necessary education about the home care process.

✓ The importance of diet, exercise, medication, and appointment times is emphasized.

✓ Anxiety can occur in the first days of life at home. The patient may experience a mild episode of depression. In this case, they are referred to psychological support.

✓ Infections may develop in all parenteral routes and immunosuppressive therapy. Thus, appropriate care is given, and aseptic technique is used.

✓ Also, attention should be paid to personal care in terms of medication therapy.

✓ Harmful habits, such as smoking and alcohol, should be stopped.

✓ A salt-free or less salty diet is recommended [14].

Drugs and Use

✓ Immunity is supported to prevent organ rejection. Antibiotics are used to prevent infection, diabetes, and blood pressure fluctuations. If necessary, cholesterol-lowering drugs are used [11].

✓ A special treatment program is prepared for the patient. The name of the drug, dosage, mode of use, and daily intake times are documented. He/she should always carry the drug user guide with him after discharge.

- ✓ The patient understands the side effects of the drugs.
- ✓ The patient is always told to take their medication 10–15 days in advance. He/she should always have spare medicine with him.
- ✓ The chronic disease drugs used before the transplant are also continued.
- ✓ If the drug is not taken on time or the wrong dose is taken, the patient must inform the transplant doctor.
- ✓ In general, certain drug derivatives are used to prevent organ rejection. These include cyclosporine-A, tacrolimus, Cellcept, sirolimus, Imuran, and corticosteroid medication [33, 34].

Conclusion

Beliefs, religions, broad cultural attitudes, and interactions about organ donation are quite complex. The clergy should be educated about brain death and organ donation for transplantation. The process starts with organ donation. To be successful, the recipient's parameters must be compatible with the donor's parameters. Psychosocial preparation and adequate communication with the team are required. Post-transplant care is very important for acceptance of the organ by the body. A special care plan is prepared for the needs of the patient. Communication with the transplant team is supported. The importance of possible complications is explained and actions to be taken are planned. A holistic approach is provided to the patient. A nursing duty is to optimize post-transplantation by using pre-transplant care and precautions.

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