Nurs. 450 Transplant Paper: Liver Transplants

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The purpose of this paper is to provide the student with the opportunity to demonstrate integration of the knowledge necessary to care for the patient with an organ transplant. The paper should integrate knowledge from the physical, social and nursing sciences and learning theories to assist the patient and family in meeting their needs. The student will select an organ of interest from heart, lung, heart-lung, kidney, pancreas, kidney-pancreas, liver, stem cell, small bowel, or bone marrow.

Pathophysiology

Almost 6500 liver transplants were performed in 2007 with a patient survival rate greater than 85% after a year and at a rate of 70-75% after five years. Liver transplantation is for patients who suffer from irreversible acute or chronic liver disease and therapeutic management is no longer working. Some diseases that cause end stage liver disease include chronic viral hepatitis C, Wilson’s disease, Hepatocellular Carcinoma, and alcoholic liver disease (Laennec disease) (Urden, Stacy, Lough, 2010). During a liver transplantation the old liver is removed from the patient through an incision in the upper abdomen then the new liver is then placed in the old liver’s place attaching it to the patient’s blood vessels and bile ducts (Ignatavicius & Workman, 2010).

The leading indication for liver transplantation in the United States is caused by HCV induced cirrhosis. The virus causes an immune response which leads to cellular injury and inflammation causing obstruction of bile canaliculi leading to several complications. HCV is a single stranded RNA virus that is transmitted blood to blood and the risk increases with multiple sex partners. There are four phases of the clinical course of hepatitis, incubation, prodromal, icteric, and recovery phase (Ignatavicius & Workman, 2010). On average the incubation period
is 7 weeks and most people are unaware that they are even infected. Prodromal phase usually begins about 2 weeks after the incubation period and ends with the appearance of jaundice. Some signs and symptoms seen during this phase include nausea, vomiting, headache, right upper abdominal pain, and low grade fever. During this phase the virus is highly transmissible (McCance & Huether, 2006).

The next phase is icteric phase lasts up to 6 weeks. At this phase the urine may be dark and stools are clay colored. The patient begins to become jaundice in appearance due to the hepatocellular destruction. This phase is the actual illness where the liver is enlarged and tender. Signs and symptoms at this phase include severe fatigue and pain. The last phase is recovery which begins at the disappearance of the jaundice. However, this phase can also be the beginning of chronic Hepatitis C virus where the clinical manifestations and liver inflammation continue (McCance & Huether, 2006). Chronic viral hepatitis is when the liver is inflamed longer than 6 months (Ignatavicius & Workman, 2010).

It is commonly caused by illicit drug usage with IV needle sharing, blood or organ transplants before the year 1992, unsanitary tattoo equipment, needle stick injury that has been contaminated by HCV, and sharing of cocaine intranasally. Damage to liver is caused by chronic inflammation over periods of time which causes the liver cells to scar which leads to cirrhosis and then liver cancer and failure. HCV is diagnosed by acute elevations in levels in liver enzymes, ALT and AST. The patient may also have increasing jaundice and elevated levels of bilirubin in the urine. The patient is also screened using Enzyme-linked immunosorbent assay (ELISA) testing the HCV antibodies. An even more specific test can be done, which is called recombinant immunoblot assay (RIBA) it shows that the patient was exposed to HCV and has
been producing antibodies. Liver biopsy is another diagnostic test used to confirm and establish the stage and grade of liver damage (Urden, Stacy, & Lough, 2010).

**Recipient Criteria**

*Physical.* In order to be considered for transplantation candidates must have health that is failing but not so much that it is not able to survive the transplantation. A major factor in post surgery recovery is the patient’s body mass index (BMI) because the patient’s BMI is less than 20 which is considered underweight or is morbidly obese which is considered a BMI over 40 then they are at a greater risk for death. Liver transplants are contraindicated in patients who are not likely to survive the surgery, would not survive the long term effects of being on immunosuppression, noncompliant patients, and those who have a disease that is likely to reoccur. Other contraindications include brain death, metastatic malignancy, and acquired immunodeficiency syndrome (Urden, Stacy, & Lough, 2010).

Included in the recipient criteria is a thorough recipient health history evaluation. In the health history evaluation includes questions about risk factors for viral hepatitis, family history of liver disease, current and past medical history, social history, status of immunizations, and descriptions of symptoms and complications such as jaundice, bone pain, or ascites. Once the patient history was evaluated then there is a patient work up that is initiated. Physical exam determines appropriate diagnostic testing. During this period the patient and family are educated regarding the evaluation, waiting list, surgery, postoperative management, long term follow up, and possible outcomes. At this point in the process the patient is either chosen to be a candidate, is not a candidate, or the patient in future could be a candidate but has not met all of the criteria yet. At this stage, some signs and symptoms that would be expected during the waiting period includes nausea, fatigue, and pain (Urden, Stacy, & Lough, 2010).
Once the patient has been accepted as a candidate then they get placed on a waiting list. The recipients are categorized by the risk of mortality which is calculated by the Model for End Stage Liver Disease (MELD). The criteria for MELD are based on serum total bilirubin, serum creatinine, prothrombin time, and international normalized ratio. The higher the number equals the higher on the waiting list the patients are placed. The next stage of the process is the waiting period, which some patients feel is the most difficult stage because it seems that their lives are on hold. In some occasions patients even die while on the waiting list. An end stage liver patient who is waiting poses great challenges for the intensive care unit because of the complications associated with the disease process such as hepatic encephalopathy, coagulopathies, portal hypertension, severe fluid and electrolyte imbalances, cardiac compromise, and renal deterioration (Urden, Stacy, & Lough, 2010).

Due to these complications they require frequent neurological assessments in order to determine the patient’s continued candidacy for transplantation. Certain labs and diagnostic tests used for evaluation include liver function profile such as AST and ALT, bilirubin, prothrombin time, cholesterol, kidney function such as creatinine, sodium, potassium, and hematology such as CBC and reticulocytes. Nutritional profiles are also important vitamin levels, and iron studies. Careful documentation of fluid intake and output is important due to the risk of ascites. Ascites, which is fluid in the abdomen, can interfere with lung expansion therefore compromising oxygenation and make adequate nutrition difficult (Urden, Stacy, & Lough, 2010).

**Psychosocial.** Liver transplantation is a major psychosocial impact related to the complications that can come from the surgery. Constant reassurance that most of these are common complications with a successful transplant to the patient and the family, and by collaborating with other members of the health care team is important. There may possible may
also feel a sense of financial burden and anxiety related to hospital costs and insurance coverage. During this stage, patients may also feel a sense of guilt in knowing that a person is going to die in order for them to receive a liver if the donor is live. That is why it is important to educate the patients and their families, assessing their psychosocial, and providing support groups through this difficult time (Urden, Stacy, & Lough, 2010).

While waiting on the list for transplantation patients often feel anxious and depressed (Urden, Stacy, & Lough, 2010). It is important during this stage that the patients have active coping strategies because it has been shown that having coping strategies can help with maintain mental health at these times. It is important to realize that physical and mental health are both influenced by psychiatric factors such as depression and coping strategies as concluded by the study “Importance of depression and active coping in liver transplant candidates quality of life”. In the study 131 liver transplant candidates were assessed by using Medical Outcomes Study Short Form quality of life questionnaire and psychiatric diagnostic criteria finding that both physical and mental components are more related to depression and active coping strategies than clinical and sociodemographic factors (Telles-Correia, Barbosa, Mega, & Monteiro, 2009).

Another article that researches the patient’s experience while on the waiting list is “Patients’ experiences of waiting for liver transplantation”. It discusses that there are several factors that influence the patients waiting experience as related by the cause of liver failure because it can affect how long they are on the waiting list and other factors. The purpose of the study was to examine recipients’ experiences while being on the wait list for transplantation. Using an exploratory design with a sample size of 21 found that uncertainty and death were a major focus on recipients on the waiting list. Another major focus was severe lack of energy experienced by the recipient while on the waiting list. The article found that most patients
experienced psychological distress during the diagnostic testing period and when they were diagnosed. In addition, most patients felt a sense of fear related to the expectation of dying before they even reached surgery for liver transplantation. Some in the study expressed that being depressed was related to their inability to participate in activities due to extreme fatigue. Other emotions expressed when put on the waiting list include happiness, relief, and feelings of joy. Recipients also felt a sense of uncertainty related to their health, life, and death during the waiting period (Bjørk, & Nåden, 2008).

Donor Criteria

*Physical.* Understanding and realizing donor criteria is just as important in understanding recipient criteria. The liver must be healthy and undamaged in order to transplant. Matching blood type and body size are two parts of donor criteria. The donors are carefully screened for certain infectious disease and metastatic carcinomas because these can be transmitted to the recipient. There are two types of liver transplant, one coming from a donor who is brain dead and another coming from a living donor. If the liver is coming from a donor who is brain dead it is important to expedite the preoperative recipient preparation. Preservation solution is then used to allow for longer cold ischemia time, or the length of time from when the organ is removed from the donor, flushed, and stored in ice to the time it is transplanted. Increased recipient morbidity and mortality is associated with cold ischemia that lasts longer than 12 hours (Urden, Stacy, & Lough, 2010).

Once a physiologic and psychologic preparation and testing is done then a live donation can be made (Ignatavicius & Workman, 2010). Live donor criteria includes blood type compatibility, tests to determine liver function, testing of the kidney and thyroid, and screening for transmittable diseases. Physical examination will also be performed to determine the donor’s
overall health (Columbia University Medical Center, 2007). In living donors, the left lateral hepatic lobe is resected, the whole left hepatic lobe is resected, or the whole right hepatic lobe is resected. With whole left or right hepatic lobe resections, it takes approximately 30 to 60% of the liver mass from the live donor. Complications include bile leak, bacterial infection, incisional hernia, pleural effusion, neuropraxia, wound infection, and abdominal abscess. In addition, more severe complications that can occur for the donor includes portal vein thrombosis, inferior vena cava thrombosis, and death. After the liver is resected it regenerates growing in size meeting the body demands (Ignatavicius & Workman, 2010).

**Psychosocial.** In the article, “Feelings of living donors about adult-to-adult living donor liver transplantation” determines the feelings experienced by live donors about their adult to adult transplantation. The study consisted of 18 donors and used a semistructured interview and content analysis. The findings of the study were that many of the donors before the transplantation wanted the recipients to live for the donors and family, and that they donated their liver because there was no other person who could donate for the person. In addition, it found that most did not feel anxious and did not even consider it dangerous. For some, after transplantation the verbalized a sense of gratefulness and were concerned about the recipients. Implications include the importance to realize the donors’ perceptions and feelings toward the surgery and the recipient. In addition, that everyone will have a different outcome from the surgery and patient education can be helpful during the before and after (Kusakabe, Irie, Ito, & Kazuma, 2007).

**Therapeutic Management**

Liver transplantation is a difficult and lengthy surgery lasting between 4 and 12 hours. Nursing diagnosis associated with postoperative liver transplantation includes risk for infection
related to the immunosuppressive medications required to prevent rejection of the transplanted liver. Another diagnosis is imbalanced nutrition: less than body requirements related to the lack of exogenous nutrients and the increased metabolic demand. In addition, anxiety is another nursing diagnosis that can be used related to the threat to biologic, psychologic, and social integrity. Most patients in the intensive care unit are still under anesthesia and remain intubated for 12 to 24 hours. The immediate goals of the nurse are to reestablish normal body temperature, stabilize hemodynamically, and maintain an effective airway. The critical care nurse must achieve rewarming safely by use of certain interventions such as blankets and heating lamps. The two common complications associated with acute graft rejection and infection (Ignatavicius & Workman, 2010).

Organ rejection. Acute rejection mostly commonly occurs during the first months after transplantation. A vital part of nursing therapeutic management is rejection surveillance. If serum liver function tests, ALT and AST, have become elevated can be an indication of acute rejection of OLT. Some other signs and symptoms to assess for include fever, drop in bile output, and change in the color and viscosity of the bile. Late signs and symptoms of rejection include malaise, dark urine, and clay colored stool (Urden, Stacy, & Lough, 2010).

Acute graft rejection occurs from the fourth thru tenth postoperative day and it can be prevented by prophylaxis with cyclosporine, an immunosuppressant, and early diagnosis to treat more potent anti-rejection drugs (Ignatavicius & Workman, 2010). Treatment for acute rejection requires increasing immunosuppression either by an increase in Tacrolimus or steroid dose and possibly adding monoclonal or polyclonal antilymphocyte antibodies. Besides acute rejection, which is a cellular mediated event, patients can also experience chronic rejection which is a humoral event (Urden, Stacy, & Lough, 2010).
Chronic rejection is progressive and not reversible, usually requiring the patient for another transplantation of the liver if they are still a candidate. Signs and symptoms of rejection include tachycardia, fever, right upper quadrant or flank pain, decreased bile pigment and volume, and increasing jaundice. Laboratory labs include elevated serum bilirubin, rising ALT and AST thrombin time/international normalized ratio (PT/INR). It is treated aggressively with immunosuppressive drugs increasing the patient’s risk for infection. If the liver is rejected by the recipient’s body and the therapy is no longer effective, then the liver will quickly deteriorate causing the body to go into multisystem organ failure leading to emergency transplantation (Ignatavicius & Workman, 2010).

In the article, “Perceptions of experiences of graft rejection among organ transplantation recipients striving to control the uncontrollable” it investigates the different perceptions about graft rejection and the ways to obtain knowledge about graft rejection. It was a phenomenography design with a sample size of 16 finding that patients’ different graft rejection perceptions were divided into categories such as abstract threat to life, concrete threat to health, trust in the body, striving to control the treat, and one’s identity. It also found that by using the personal explanation model and inner perspective involved threat, fear, trust, control, and identity adjustment. In addition, some participants felt self-guilt, powerless, anxiety, and uncertainty related the thought of graft rejection. This can be applied because it shows that based on the patient’s perceptions is how we should approach teaching and care (Nilsson, Persson, & Forsberg, 2008).

**Immunosuppression.** Due to immunosuppressive therapy established during the liver transplantation it puts the recipient at an increased risk for infection. Infections are the most common complication and leading cause of death in orthotopic liver transplants (OLT). People
who come into contact with the patient must perform good hand hygiene and follow standard precautions (Urden, Stacy, & Lough, 2010). The patient is put on immunosuppressions as stated previously to prevent organ rejection. One immunosuppression used prophylactically to prevent organ rejection is Cyclosporine, or Neoral (Ignatavicius & Workman, 2010). It inhibits cellular humoral immune responses by inhibiting interleukin-2, which is a proliferative factor needed for T-Cell activity. Some signs and symptoms include fever, chills, and chest pain. Nursing implications for this medication is to monitor the patient for nephrotoxicity (Skidmore-Roth, 2009).

Another immunosuppression that is given to prevent organ rejection is Tacrolimus (Prograf) which inhibits activation of the T-lymphocytes by binding to intracellular proteins forming a complex inhibiting phosphate activity. It lowers the body’s ability to fight infections, therefore some signs and symptoms to observe for are shaking, headache, nausea, and vomiting. Nursing implications include do not begin the therapy no sooner than 6 hours postoperative. Mycochenolate, CellCept or Myfortic, is another immunosuppressant used to prevent graft rejection. By inhibiting isosine monophosphate dehydrogenase, an enzyme that deprives lymphocytes of nucleotides necessary for DNA, RNA synthesis it lowers the body’s immune system. Implications for the nurse include monitoring the patient for signs and symptoms of infection (Skidmore-Roth, 2009).

*Nutrition.* After the surgery, the patient has a nasogastric tube for nutritional concerns. Once the output is minimal and bowel sounds are present the tube is removed. When the patient is stable a nutritionist is brought on for consultation. The diet is slowly advanced as tolerated by the patient once the bowel sounds are present (Urden, Stacy, & Lough, 2010). Specific diet for those patients who have a disease liver includes high carbohydrates and protein for healing, and...
low sodium to help with control of fluid accumulation. Vitamins with IV solutions may be useful to promote nutrition because the liver cannot store vitamins (Ignatavicius & Workman, 2010). Some other considerations include avoiding alcohol intake and grapefruit products, which interfere with medications and can be come toxic to the liver (Urden, Stacy, & Lough, 2010).

**Discharge Teaching**

It is important as the nurse to educate the patient and focus on discharge planning. Some areas to focus on include self-administration of medications, monitoring vital signs, incision care, prevention of infections, and identifying potential risk and complications. Discharge instructions must begin as the patient is alert. Discharge teaching must provide about rejection surveillance, signs and symptoms of infection, lifestyle changes if needed, long-term medication considerations, and follow-up care. Behavior modifications and lifestyle changes should also be reinforced at this time to increase the chance of good long term health (Urden, Stacy, & Lough, 2010).

According to the Center for Liver Disease at the Columbia University Medical Center it states that liver transplant will last and are more likely to become successful when the patient is compliant with follow up care. Compliance to immunosuppression medications, lifestyle behaviors, infection avoidance, and staying on medication schedule will all contribute to a successful postoperative life. They also state normal activity should be returning approximately 3 months after surgery and the first three are deemed the most difficult. After 3 months, work, playing sports, exercising, and sexual activity are all possible. The patient will be on several medications during this time of recovery which include several side effects from the medications as well. These patients will be taking immunosuppression medications for the rest of their lives to prevent rejection. It is important that the patient make some lifestyle changes, such as not
drinking any alcoholic beverage because they are harmful to the liver and may interfere with the recipient’s medications (Columbia University Medical Center, 2007).

In the article, “Alternative therapy use in liver transplant recipients” it discusses the psychological distress associated with people that have gone through liver transplantation and the use of alternative therapies. Using a questionnaire for the sample of 32 found that 34.4% of the liver transplant patients used some form of alternative therapies. It was also found that alternative therapy users had a higher problem focused coping skills. Patients not only used herbal products that were thought of to help the liver but also used psychological therapies to help them cope. Some therapies that the patients used were acupuncture, relaxation, massage, and most commonly megavitamins (Tickerhoof, Wagener, Cacciarelli, & Singh, 2006).

Implications for nursing are that helps to recognize that alternative therapy is common in transplant recipients. It is important because nurses take care of a patient holistically and psychosocial is just as important as physical health. These alternative therapies may be useful to patients who are having a hard time coping with the transplantation. In addition, it is important to discuss with the patient to report any alternative therapies being used to the nurse and doctor because they may have an adverse affect with the medication that is already been prescribed by the doctor (Tickerhoof, Wagener, Cacciarelli, & Singh, 2006).

Another aspect of the article stated previously titled “Perceptions of experiences of graft rejection among organ transplant recipients striving to control the uncontrollable” was to examine different methods to educate and obtain knowledge about graft rejections. Patient education during discharge about graft rejection, complications, and strategies that help the patient cope with their life after transplantation and ways to reduce the risk of infection or rejection is vital. We should detail the patient education strategies to the specific patient
including models, guidance, written information, and reassurance (Nilsson, Persson, & Forsberg, 2008).

Conclusion

Liver transplants with live and dead donors are increasing and becoming more common. Therefore, the chances of taking care of a patient who either is going to be a transplant recipient, a donor, or who have a past medical history of a transplantation is increasing. At each stage of the process the nurse is a vital person for the patient whomever they may be. One way to use this information is by patient teaching either out in the community or in the hospital in order to prevent liver failure and the need for transplantation. By teaching the patient ways to prevent hepatitis C virus infection and transmission through simple interventions such as hand washing, not sharing IV needles, and careful disposure of needles to prevent finger sticks can reduce the amount HCV. Another way to use the information is when actually caring for a patient who is on the wait list for receiving a transplant.

These patients may be present in the hospital emergency department or in the intensive care units once their signs and symptoms have exacerbated. At his point it is important to prepare the patient for transplantation and educate them as well as the family. Lastly, this information acquired can be used for postoperative patients by reassuring the patient and family what to expect, what are common complications, and relieving any fears or concerns that may be present. Integration of the physical, social, and nursing interventions to care for a liver transplant recipient and donor through education and knowledge will help increase the success of transplantations.
References


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