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# "Case study on Management of Fulminant Liver Failure – A Nurse's Perspective".

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## I. Introduction

**Acute Liver Failure (ALF)** is defined as severe acute liver injury with encephalopathy and impairment of synthetic function (INR $>$ 1.5) in a patient without pre - existing cirrhosis or liver disease commonly used time frame for definition is failure of less than 26 weeks duration.

**Acute Liver failure (ALF)** is a rare and often heterogeneous presentation of severe liver dysfunction in a patient with otherwise no pre – existing liver disease. Though it has high morbidity and mortality. Its overall survival has improved through intensive care management and emergency liver transplantation. A high index of suspicion, early referral to a specialist liver transplantation center, and adequate supportive management remain the cornerstone for the management of ALF. Future better understanding and knowledge of the pathophysiology of liver injury and management of multi- organ failure will help improve outcomes.

An extensive workup for the etiology of ALF is recommended, as this guides directed therapy and helps determine the outcome. Viral hepatitis and drug-induced hepatitis are the two most common causes of ALF worldwide. Other causes include hypoxia-induced liver injury, acute Budd-Chiari syndrome, veno-occlusive disease, Wilson disease, mushroom ingestion, sepsis, autoimmune hepatitis, acute fatty liver of pregnancy, HELLP (hemolysis, elevated liver enzymes, low platelet) syndrome, heatstroke, and malignant infiltration (with metastasis from breast cancer, small cell lung cancer, and lymphoma) of the liver.

Drug-induced hepatitis accounts for almost half the cases of ALF in the United States, of which acetaminophen is the most common cause. Acetaminophen toxicity is dose-dependent. Drug-induced hepatotoxicity could be idiosyncratic, but this is usually rare. Unintentional ingestion of acetaminophen-induced hepatotoxicity leading to liver failure is more common in patients with concomitant alcohol abuse and malnourishment.

Hepatitis A and E are the leading causes of liver failure, most of which are reported from developing countries. Hepatitis B infection could cause liver failure from both acute infections, as well as, from reactivation of hepatitis B following initiation of immunosuppressive therapy. Co-infection with both hepatitis B and C could lead to ALF, although it is rarely seen with hepatitis C alone. Other viral etiologies of ALF include herpes simplex virus, cytomegalovirus (CMV), Epstein-Barr virus (EBV), Parvovirus's, adenovirus, and varicella-zoster virus.

## II. Case Description

A 8-year-old child presented to a gastro OPD with the history of nausea, fever, yellowish discolorations of eyes, high colored urine and poor appetite. On evaluation he was found have jaundice, advised admission, initially resistant by parents, went back and took Ayurveda treatment, came back with elevated PT INR and SBR levels, he was admitted in Apollo BGS hospital on 06-04-2022 in general ward. He was started on inj-vit-k-10mg IV stat followed by OD for three days, syr-larz-10ml-HS,Tab-ursocol 150mg-BD for -5days,Inj-Pan40mg IV-OD,IVF-DNS 50ml / hr. Advice GRBS 8$^{th}$ hrly it was normal. On assessment right liver palpable 3.5cm below non tender. On 08-04-2022 repeat ultrasound done in view of persistent increase PT INR, liver size shows 12.8cm,enlargedin size, shows normal echo pattern. Diffuse GB edema with sludge in the lumen, mild ascites present, features favor acute hepatitis. Electrography shows increased med stiffness valve, spleen 10. 0cm.continued NAC infusion, Inj-ceftriaxone 600mg-BD started. On 09-04-2022, need for liver transplant in case of worsening of condition explained to the relatives. On 10-04-2022, diagnosed acute liver failure.

PT INR increased to 3.29, morning hypoglycemia despite midnight snack. Grade 1 hepatic encephalopathy, altered sleep and one spike of fever. All the parameters and Lab workup was suggestive of jaundice leading to acute liver failure. Based on the clinical findings and laboratory workup, planned for liver transplant. Family was again counselled all about the need for urgent liver transplantation and also explained on chances of mortality in case of progressive liver failure.

The transplant surgeon there had suggested them to undergo liver transplant as that is the only curative treatment for this fatal disease. Subsequently the family members wanted to discharge the child due to financial reasons. But continuous follow up and counseling by the doctors, father as potential donor work up started and registered the child under supra urgent category. Crowd funding was initiated by the hospital.

A cadaver liver donation was available at the same time giving hope to the parents, deceased donor organ transported under green corridor, he received a split left lobe of the liver. On 14-04-2022 split deceased donor liver transplant surgery started at 5.35pm, ended on 15-04-2022 at 3. 30am.shifted to transplant ICU with ventilator support. At 04.05 am Shifted the patient to transplant unit with ventilator support (ACMV Mode, FIO2 60%).

CVP line, Arterial line left and right side Drain present, RT insitue. Inj-Nor-ad-0.5ml, inj-Vasopression-0. 5ml.Inj-Mucomix 2.4gms over- 24 hrs.IVF-40ml/hr. on flow.

On 2nd post-operative day weaning started as per the doctor's advice based on ABG report. Extubated and connected to 6lr oxygen through oxygen mask. Slowly reduced to 2lr oxygen till 8th POD. On 9th POD oxygen stopped maintained saturation with room air.

He was supported with prophylactic, antimicrobials, antibiotics, platelets and packed red cells. Gradually he has started walking and started post liver transplant diet. He was observed for 5 more days in isolation ward and discharged on 30th April with good condition.

**Medical Management:**

- Intravenous fluids to maintain blood pressure.
- Medication such as laxatives or enemas to help flush toxins out.
- blood glucose monitoring.

Three principles types of medical treatment are follows;

Curative –to cure a patient of an illness.
Palliative- to relieve symptoms from an illness.
Preventive- to avoid the onset of an illness.

**Surgical Management:**

Liver transplant: When liver disease progresses to liver failure, a liver transplant may be the best treatment option. A transplant replaces the liver with a healthy liver.

**Nursing management**

Highly skilled and specialized nursing care is essential for all the nurses who works in transplant unit**.** The nurses in the team plays an integral role during the entire transplant process,

During the pre-transplant phase, nursing expertise is exemplified in the administration of medications, management of side effects and complications, teaching of transplant procedures to patient and family and supportive care which starts on the day the patient and the family decides to go for transplant on admission to the unit, and that continues throughout their journey.

**Infection Prevention:**

Any personnel who enters the transplant unit adhered to the infection control practices. However, the nurses in the department holds the baton to ensure everyone in the department followed the practices to 100% compliance, Strict aseptic technique, personal and environmental hygiene was maintained, Regular mouth wash for oral care was given, all care bundles of central line insertion and maintenance was followed.Neutropenic food was provided to maintain adequate nutrition, Proper Isolation practices and maintaining the required positive pressure and proper maintenance of HEPA filterwas done.

**Drugs**:

The patient was advised to continue immunosuppressant cap-prograf 0.5mg, Inj-targocid 200mg-once a day, Inj-fluconazole 100mg-OD, Inj-Pan 40mg BD, Inj-mucomix infusion 1ml /hr. for 24hrs, Inj-merophenam 500mg-BD, Inj-albumin-20% -5 ml /hr. for 24hrs, IVF –Kabilyte/ DNS -60ml / hour, Tab-Valgan 450mg for three time a day,Tab-Wysolone-20mg for OD. The patient was advised to do the TAC levels weekly and to maintain the immunosuppressant cap-prograf dosage accordingly

**Care of Central Line**:

A CVC was inserted prior to the transplant. Complete aseptic technique maintained, on 6$^{th}$ post-operative day CVC line removed and inserted IV line.

**Nutritional Support:**

The course of transplant is long, and the side effects like nausea and vomiting is unavoidable during this time. The food intake became lesser. A Ryle's Tube was inserted and feeding given as per his calorie requirements. Diversional therapies like music and television helped to some extent. Usually for liver transplant patient was advised for neutropenic fat free diet and also patient presented kylie in the drain so he was started on MCT (medium chain triglycerides)

Calorie requirement per day was -1566 Kilocalorie, it was calculated by BMR x 1.5 -2 (1044.6 x1.5) = 1566 K cal /day.

Protein (gm) = 56g. it was calculated by 2.25g / kg =28x2 =56g.

**Management of pain**:
Pain is assed every hourly and managed accordingly. A systematic escalation of analgesics done to alleviate the symptoms. Fentanyl infusion and inj-paracetamol 50ml for the pain control was used.


**Management of Side Effects and complication:**
A nurse should be skillful and knowledgeable about the transplant and the disease condition in observing for possible side effect, early identification and management of side effects and complications.

**Bacterial, Fungal and Viral Sepsis:**

Strict aseptic technique and hand hygiene practices were followed. Close monitoring of vital signs and watching for and managing the warning signs like hypotension, tachycardia, tachypnea and changes in oxygen saturation was ensured. The patient was under continuous monitoring of weight, abdominal girth, intake and output to rule out any early signs and measure the drain hrly.

**Follow Up:**

On Day 16$^{th}$ POD the child has been discharged from the transplant unit in a stable conditionwith all necessary instructions. The patient was instructed to visit gastro OPD unit weekly once for a blood sampling, thereafter for a regular check up with the transplant physician to have detailed evaluation and monitoring for any complications which might arise at this time. The parents were advised to avoid crowded places, dusty areas and contact with people who has symptoms of infections.

**Patient and Family Education:**

Patient and family education is a team effort and that starts on the day the patient or the family approaches the transplant physician or any of the transplant team, and it continues whole throughout the transplant journey. The transplant nurse shoulders the responsibility of teaching the patient in every transplant unit as they are

available all the time with the patient. The nurse plays a major role in enhancing the family's level of understanding about The process of transplant and its possible side effects. The isolation practices and policies and its significance Hand hygiene and personal hygiene practices and its importance. The importance of take care of surgical site and how it prevents surgical site infections. Educating the family and preparing them for the discharge towards the recovery starts on the day of admission itself.

## III. Discussion:

This case illustrates the accurate diagnosis, prompt treatment and effective nursing management of fulminant liver failure which is a rare disease.

## Reference

[1]. Ramachandran A, Jaeschke H. Acetaminophen Hepatotoxicity. Semin Liver Dis. 2019 May; 39(2):221-234. [PMC free article] [PubMed].

[2]. Lima LCD, Miranda AS, Ferreira RN, Rachid MA, Simões E Silva AC. Hepatic encephalopathy: Lessons from preclinical studies. World J Hepatol. 2019 Feb 27;11(2):173-185. [PMC free article] [PubMed].