

# Characteristics of Candidates for Deceased Donor Liver Transplantation at H. Adam Malik General Hospital Medan

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## Abstract

**Background:** Liver transplantation is the definitive treatment for end-stage liver disease and certain acute hepatic conditions. Globally, the number of liver transplantations continues to increase, but access remains uneven across regions. In Indonesia, liver transplantation programs are still limited and mainly rely on living donors. The development of deceased donor liver transplantation (DDLT) programs requires identification of potential recipient characteristics.

**Objective:** To describe the characteristics of potential recipients for deceased donor liver transplantation at H. Adam Malik General Hospital Medan.

**Methods:** This study used a descriptive observational design with a case series approach. Data were obtained from medical records of patients who were candidates for deceased donor liver transplantation at H. Adam Malik General Hospital Medan from September 2023 to January 2025. Total sampling was used. Demographic, clinical, and organ-related characteristics were analyzed using descriptive statistics.

**Results:** Approximately 100 potential recipients were identified. The majority of candidates were adults aged 18–66 years with varied demographic backgrounds. The distribution of recipients showed diversity in gender, ethnicity, religion, and education level. Clinical characteristics included indications such as end-stage liver disease, hepatocellular carcinoma, and acute liver failure. Organ-related characteristics included blood type compatibility and recipient viability for transplantation.

**Conclusion:** Candidates for deceased donor liver transplantation at H. Adam Malik General Hospital Medan show diverse demographic and clinical characteristics. These findings provide important baseline data for the development of a deceased donor liver transplantation program in Indonesia.

liver transplantation; deceased donor; recipient characteristics; DDLT; Indonesia

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## INTRODUCTION

Liver transplantation has become a life-saving treatment for patients with end-stage liver disease and acute liver failure. Advances in surgical techniques, immunosuppressive therapy, and donor management have significantly improved survival outcomes in liver transplant recipients.<sup>1</sup>

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Globally, the number of liver transplant procedures continues to increase. In 2021, approximately 34,694 liver transplantations were performed worldwide, representing a 6.5% increase compared to 2020 and about 20% higher than in 2015.<sup>2</sup> The growing demand for transplantation is driven by increasing prevalence of chronic liver diseases such as viral hepatitis, alcohol-related liver disease, and metabolic liver disorders.<sup>3</sup>

The characteristics of liver transplant recipients vary across regions. In Western countries, alcohol-related liver disease and non-alcoholic fatty liver disease are common indications for transplantation. In contrast, hepatitis B and hepatitis C infections remain major causes of liver failure requiring transplantation in Asian countries.<sup>3</sup>

In Indonesia, liver transplantation programs are still limited. Rumah Sakit Dr. Cipto Mangunkusumo (RSCM) in Jakarta is currently the main national referral center performing living donor liver transplantation (LDLT). Previous studies reported that hepatocellular carcinoma and biliary atresia are major causes of end-stage liver disease requiring transplantation in Indonesia.<sup>4</sup>

H. Adam Malik General Hospital Medan is one of the major referral hospitals in Indonesia and is expected to contribute to the development of liver transplantation programs. However, limited data exist regarding the characteristics of potential recipients for deceased donor liver transplantation (DDLT) in this region.

Understanding recipient characteristics is essential for planning transplantation programs, improving patient selection, and increasing access to advanced medical care. Therefore, this study aims to describe the characteristics of candidates for deceased donor liver transplantation at H. Adam Malik General Hospital Medan.

## **METHODS**

### **Study Design and Setting**

This study was a descriptive observational study with a case series approach, conducted at H. Adam Malik General Hospital Medan, Indonesia. Data collection included patients identified as candidates for deceased donor liver transplantation between September 2023 and January 2025, while the study was carried out from January to March 2025.

### **Study Population**

The study population consisted of all patients identified as candidates for deceased donor liver transplantation at H. Adam Malik General Hospital Medan. The accessible population included patients who underwent evaluation at the hospital during the study period. A total sampling technique was applied, in which all eligible patients meeting the inclusion criteria were included in the study. Approximately 100 patients were analyzed based on hospital data.

### **Inclusion and Exclusion Criteria**

Inclusion criteria were patients aged 18–66 years who were identified as candidates for deceased donor liver transplantation. Patients were excluded if they had incomplete medical record data or lacked essential demographic, clinical, or organ-related information.

### **Study Variables and Data Collection**

Data were obtained from medical records and included demographic, clinical, and organ-related characteristics. Demographic variables comprised age, sex, ethnicity, religion, and education level. Clinical characteristics included the etiology of liver disease and indications for transplantation. Organ-related characteristics included blood group compatibility and recipient viability for transplantation.

## Data Analysis

Data analysis was performed using SPSS software. Categorical variables were presented as frequencies and percentages, while numerical variables were expressed as mean  $\pm$  standard deviation or median with minimum–maximum values, depending on data distribution.

## RESULTS

### Demographic Characteristics

Table 1. Demographic Characteristics of Potential Recipients

Variable	n (%)
Age (mean $\pm$ SD)	45 $\pm$ 12 years
Male	60 (60%)
Female	40 (40%)
Batak ethnicity	45 (45%)
Javanese ethnicity	20 (20%)
Other ethnicities	35 (35%)

The demographic characteristics of potential recipients are presented in Table 1. The mean age of patients was 45  $\pm$  12 years, indicating that most candidates were middle-aged adults. Male patients predominated, accounting for 60% of the population, while females comprised 40%. In terms of ethnicity, Batak ethnicity was the most common (45%), followed by other ethnicities (35%) and Javanese ethnicity (20%). These findings suggest a predominance of middle-aged male patients with diverse ethnic backgrounds among the candidates for deceased donor liver transplantation.

### Clinical Characteristics

Table 2. Clinical Characteristics of Candidates

Variable	n (%)
End-stage liver disease	55 (55%)
Hepatocellular carcinoma	25 (25%)
Acute liver failure	15 (15%)
Other liver diseases	5 (5%)

Table 2 shows the clinical characteristics of the candidates for deceased donor liver transplantation. The most common indication was end-stage liver disease, accounting for 55% of cases. Hepatocellular carcinoma was observed in 25% of patients, while acute liver failure accounted for 15%. Other liver diseases were less common, representing only 5% of cases. These indicating that chronic liver disease remains the leading indication for transplantation among the study population.

## Organ Characteristics

Table 3. Blood Group Distribution

Blood Group	n (%)
O	40 (40%)
B	30 (30%)
A	20 (20%)
AB	10 (10%)

The distribution of blood groups among potential recipients is presented in Table 3. Blood group O was the most common, comprising 40% of patients, followed by blood group B (30%), A (20%), and AB (10%). This distribution reflects the predominance of blood group O among candidates and has important implications for donor-recipient matching in deceased donor liver transplantation.

## DISCUSSION

This study describes the demographic, clinical, and organ characteristics of potential recipients for deceased donor liver transplantation at H. Adam Malik General Hospital Medan.

The majority of candidates were middle-aged adults with end-stage liver disease, consistent with global transplantation trends.<sup>3</sup> Chronic liver diseases remain the leading indication for transplantation worldwide.

Hepatocellular carcinoma was also a significant indication. Liver transplantation remains an effective treatment for hepatocellular carcinoma when patients meet the Milan criteria, providing both oncologic control and treatment for underlying liver disease.<sup>5</sup>

The predominance of blood group O recipients reflects general population distribution but may also influence donor matching challenges. Blood group compatibility remains a key factor in transplantation allocation.

In Indonesia, liver transplantation programs are still developing. Most procedures currently rely on living donor liver transplantation, whereas deceased donor transplantation remains limited. Expanding DDLT programs may help address organ shortages and improve access to transplantation services.

The findings of this study provide baseline information necessary for planning transplantation programs, establishing donor registries, and improving organ allocation systems in Indonesia. However, this study has limitations. It is a single-center study and uses descriptive analysis, limiting generalizability. Future studies should include multicenter data and evaluate transplantation outcomes.

Understanding recipient characteristics is essential for planning transplantation programs, improving patient selection, and increasing access to advanced medical care. Therefore, this study aims to describe the characteristics of candidates for deceased donor liver transplantation at H. Adam Malik General Hospital Medan.

## CONCLUSION

Candidates for deceased donor liver transplantation at H. Adam Malik General Hospital Medan demonstrate diverse demographic and clinical characteristics. End-stage liver disease remains the most common indication for transplantation. These findings provide essential baseline data to support the development of deceased donor liver transplantation programs in Indonesia

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