

FACTORS IMPEDING THE PRACTICE OF LIVER TRANSPLANTATION IN WEST AFRICA

¹Okonkwo UC, ²Onyekwere CA, ³Ngim OE,
³Nwagbara VI and ⁴Bello RN

¹Department of Medicine, University of Calabar, Calabar, Cross River State, ²Department of Medicine, Lagos State University, Lagos, ³Department of Surgery, University of Calabar, Cross River State ⁴Department of Medicine, Dalbatu Araf Specialist Hospital, Lafia

Correspondence Address: Dr. Uchenna Okonkwo, Gastroenterology/Hepatology Unit, Department of Internal Medicine, University of Calabar, P.M.B. 1115, Calabar, Cross River State, Nigeria *E-mail-* ucsuizes@yahoo.co.uk, drucokonkwo@unical.edu.ng

ABSTRACT

Background: The burden of liver disease is increasing globally due to the rising prevalence of its risk factors. This is particularly true in West Africa where hepatitis B virus (HBV) is endemic. Since liver transplantation (LT) was established as a definitive treatment for end-stage liver disease, the centers for liver transplantation have expanded significantly. Apart from South Africa and North Africa, there are no facilities for LT in West Africa. The aim of this study was to determine the factors impeding the practice of liver transplantation amongst hepatologists in West Africa.

Methods: This was a questionnaire-based cross-sectional descriptive study conducted among hepatologists in West Africa during a regional hepatitis conference in 2015.

Results: Twenty-four hepatologists completed the questionnaire. They were from Nigeria (42%), Ghana (21%), Cameroon (21%) and Ivory Coast (17%). The indication for LT in their practice was mostly Chronic HBV infection and its complications (88%). Although there are no facilities for LT in West Africa, late presentation and financial constraints were the major reasons why patients were not referred outside the region for the procedure. More than 70% believe that factors impeding LT in West Africa are multi-factorial and mostly related to funding, infrastructure and lack of organ donation network.

Conclusion: There are no facilities for LT in West Africa. Hepatologists are unable to access LT in other Countries for their patients mostly because of late presentation and cost implications. Establishment of a regional liver transplant center for capacity building is desirable.

Keywords: Liver transplantation, West Africa

INTRODUCTION

The burden of liver disease is increasing globally due to the rising prevalence of its risk factors.¹ This is particularly true in West Africa where hepatitis B virus (HBV) is endemic.² Since 1983 when the United States National Institute of Health established liver transplantation (LT) as a definitive treatment for end-stage liver disease, the centers for liver transplantation have expanded from 3 in 1982 to over 120 centers presently in the US alone.³ The same trend is seen in Europe and Asia.^{4,5} Apart from South Africa and a few countries in North Africa, facilities for LT are non-existent in West Africa.^{6,7}

The first human orthotopic liver transplantation was performed in the United States of America by Thomas Starlz in 1967 and the same feat was achieved in Europe the following year.⁴ Since then, LT evolved rapidly especially following the discovery of new immunosuppressive agents and better preservation solutions and has become the standard of care for patients with life-threatening acute and chronic liver disease (CLD) of all aetiologies including hepatocellular carcinoma.^{8,9} Survival rates have improved significantly in the last 25 years, achieving rates of 96% and 71% at 1 and 10 years after LT respectively.¹⁰

Organ allocation for LT have evolved from the Child-Pugh (C-P) classification which was rather subjective to the current Model for End-stage Liver Disease (MELD) system with a focus on maximizing transplant benefit by allocating available donor organs according to medical urgency.¹¹ Unlike the C-P score, the MELD scoring system is based on three objective parameters. It is a continuous score and does not have the floor and ceiling effect associated with the C-P score.¹²

Liver disease (and its complications) is a major health problem with high mortality rate. The Center for Disease Control listed cirrhosis as the 12th leading cause of death for adults in the United States.¹³ Unfortunately, this number may grossly underestimate the real impact of end-stage liver disease (ESLD) because it does not include acute liver failure or other etiologies that may lead to the need for LT. West Africa is endemic for HBV with prevalence rates ranging from 8%-20%.^{14,15} In this region, HBV is predominantly transmitted through vertical and horizontal routes before the age of 5 years resulting in a high carriage rate in young adults.¹⁶ Hepatitis C virus (HCV) may be

more prevalent in some rural communities than previously documented¹⁷. In view of this, West Africa is considered a 'hotbed' for CLD especially liver cancer with incidence rates of up to 30-50/100,000 and parallel mortality rates¹⁸.

Liver transplantation has evolved from an experimental procedure to being the treatment of choice for many patients with end-stage liver disease, and is performed on a routine basis in most major hospitals around the world^{4,5}. However, certain situations such as poorly structured and funded health institutions peculiar to West Africa may have a major impact on the practice of liver transplantation in this region. The aim of this study was to determine the factors impeding the practice of liver transplantation amongst hepatologists in West Africa.

METHODS

This was a cross-sectional descriptive study conducted among hepatologists in West Africa during a regional hepatitis conference in Accra, Ghana organized by Roche Pharmaceuticals in 2015. A structured questionnaire was used to collect data on country of origin, number of LT centers in each country, indications for LT, Criteria for referral, obstacles to practice of LT and challenges encountered in the management of patients that have undergone LT including complications and cause of death. Informed consent was obtained from the participants and all identifying information was removed prior to data aggregation and analysis.

Statistical analysis: Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS) version 20. Continuous variables were presented as means and standard deviation (SD) while categorical variables were presented as percentages. Chi square was used to test for association between variables. Statistical significance was established as $p < 0.05$.

RESULTS

Twenty-four hepatologists completed the questionnaire. Forty-two percent were from Nigeria, 21% each were from Ghana and Cameroon and 17% from Ivory Coast. Chronic hepatitis B virus infection and its complications (88%) was the most common indication for LT in their practice. Others are shown

in table 1. Only 18.2% was aware that organ allocation is currently based on only the Model for End-stage

Table 1: Indications for liver transplantation in West Africa

Disease condition	Percentage
Chronic hepatitis B infection	88.2
Hepatocellular carcinoma	11.7
Chronic hepatitis C infection	5.8
Alcoholic liver disease	5.8

Table 2: Factors impeding the availability of liver transplantation facility in West Africa

Variable	Percentage
Funding	85
Infrastructure	75
Lack of organ donation network	75
Lack of manpower	70
Government policy	65

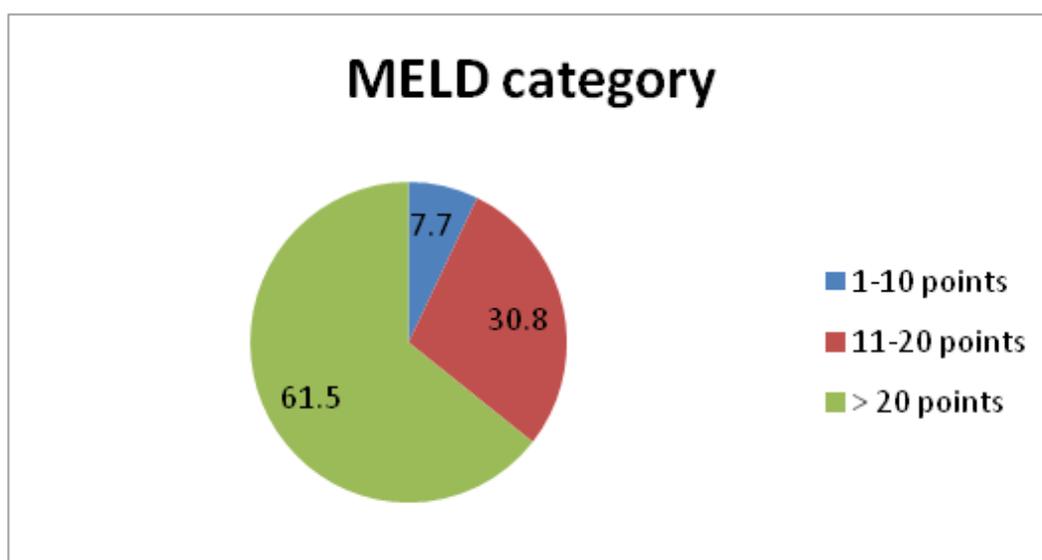


Fig. 1: MELD category for liver transplantation referral

Liver Disease (MELD) score. Of these, 61.5% reported MELD ≥ 20 as the cut-off for listing a patient for LT (Fig. 1). Fifty-eight percent reported that none of their patient needing LT had the procedure. The reasons for not referring their patients for LT include late presentation (64.2%), cost (57.1%), lack of donor organs (35.7%) and unavailability of LT facilities in the Country (28.5%). Less than half (41.7%) had managed a LT patient and only 27% had previously worked in a center for LT outside West Africa. Amongst those who had managed LT patients, there was a linear correlation between the years of practice and number of patients managed but the difference was not statistically significant ($p=0.62$). Infection was reported as the most common cause of death following LT by 35% of the respondents followed by recurrence of primary disease and chronic rejection (11.8% each). There are no facilities for liver transplantation in West Africa. Factors impeding the

availability of LT are shown in Table 2. Nonetheless, 83% would usually refer their patients to India or Europe for liver transplantation.

DISCUSSION

The West African region comprises several countries with shared socio-political values. This factor seems to underlie the way LT is practiced in this region. This study showed lack of facilities for LT in West Africa. The reasons are multi-factorial and largely related to poor funding, infrastructural and manpower deficiencies and lack of enabling government health policy. Although there are facilities for LT in South Africa and Egypt, patients are usually referred to India or Europe. The reason may be related to patient and practitioner preference and lower cost implication.

Chronic hepatitis B virus related end-stage liver disease is the most common indication for LT in this

study. This differs from the situation in North Africa especially Egypt, Europe and the United States of America where liver disease related to chronic hepatitis C virus infection and alcohol abuse are the commonest indication for LT but similar to findings from East Asia.^{4,5, 6,19} The World Health Organization had classified Sub-Saharan Africa, a region that encompasses West Africa as hyper-endemic for hepatitis B virus because the prevalence of HBV is greater than 8% in this region. This hyper-endemicity is related to mode of transmission and age of acquisition of HBV in this region²⁰. Late presentation of patients and resource constraints were the major reasons for not referring patients for LT. This would likely explain why few of the hepatologists have had the opportunity to manage a patient who had undergone LT as documented in this study. It may also contribute immensely to the dismal prognosis of liver diseases in this region.²¹ Studies have shown that poor uptake of HBV vaccination especially among adults and inadequate treatment of chronic hepatitis B virus infection is a major challenge further escalating the proportion of HBV carriers who develop advanced liver disease that require LT but cannot access it^{18,22}.

Only a few Clinicians responded correctly that the MELD system is currently used for organ allocation. This may likely impact negatively on timely referral of patients for LT. Since 2002, the MELD has replaced the C-P classification for patient prioritization on the waiting list.³ It has been reported that survival benefit following LT is highest in patients with MELD score 15^{11,23}. For patients with liver cancer, there is loading of the MELD score with waiting list time-dependent points based on tumor size, number of nodules and value of alpha-fetoprotein to facilitate early transplant.⁹ Infection was identified as the major cause of death following LT. A study in North America identified malignancy, recurrent liver disease and infection as common causes of death in post-LT patients over a 5-year period²⁴.

CONCLUSION

There is no facility for LT in West Africa. Hepatologists are unable to access LT for their patients outside the region mostly because of late presentation and cost constraints. Obstacles impeding the availability of LT in the region are mostly related to poor funding, inadequate infrastructure (both structural and

procedural) of healthcare institutions, manpower deficiencies and lack of enabling government policy. Establishment of a regional liver transplant center for capacity building is desirable.

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