ADVANCES IN HEPATOLOGY

Current Developments in the Treatment of Hepatitis and Hepatobiliary Disease

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Insights Into Liver Transplant Disparities

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G&H What liver transplant disparities have been seen in terms of sex?

VL When thinking about disparities in liver transplant, it is important to consider disease recognition, referral to a transplant center, and initiation of transplant evaluation. Prior to considering the well-known disparities of transplant wait-list additions and organ allocation, getting the patient to the transplant center to undergo an initial evaluation is a large barrier to obtaining access to transplant. In particular, patients with alcohol-related liver disease are at risk for implicit bias. It has been established that, compared with their male counterparts, females are less likely to be screened for alcohol use disorder and less likely to receive access to mental health and addiction specialists, which can help them become transplant candidates.

After patients are referred to a transplant center, female patients are less likely to be listed for liver transplant than their male counterparts. Studies cite social support, mental health comorbidities, and ongoing substance use as some reasons for this difference and call for earlier identification and support. Lai and colleagues note that female patients are more likely to be declined or delisted owing to frailty despite the objective data being equal to male patients who remain listed, suggesting some implicit bias among transplant providers.

Once active on the transplant waiting list, historically there has been a large sex disparity in access to liver transplant because of the organ allocation system used, the Model for End-Stage Liver Disease (MELD) score, which includes creatinine. It has been reported that there could be a difference of as many as 3 to 4 MELD points just because of the patient's sex, which contributes to a large access problem.

Thankfully, the organ allocation system was recently updated to utilize MELD 3.0, which includes sex as well as albumin, creatinine, and sodium. Preliminary data suggest that this may minimize disparity in access to liver transplant once patients are listed. However, because female patients generally are shorter in stature, size-matching concerns continue to contribute to a disparity in access to liver transplant.

G&H What racial and ethnic disparities have been seen in liver transplant?

VL Similar to the discussion surrounding female patients, racial and ethnic minorities are diagnosed later so they come to transplant centers with more advanced disease. If a patient of a racial minority has a primary liver cancer, their disease may have progressed further prior to even being referred to a transplant center. Providers are racing against the clock for these patients. Many studies, including ones led by Dr Amit Mathur and Dr Lauren Nephew, have investigated racial and ethnic disparities in liver transplant. What has been well established is that Black patients are referred later, as well as minorities with low socioeconomic standing, and are far less likely to be listed than White counterparts. Additional efforts to use race-free equations when estimating kidney function, which impacts the MELD score, have been made.

G&H What geographic disparities have been reported regarding access to liver transplant?

VL Some of the initial studies about geographic disparities in liver transplant come from the Veterans Health Administration (VA) system looking at the distance a patient lives from a transplant center and how that relates to the likelihood of either dying from their liver disease or receiving a transplant. There are studies from the VA system, but other groups have also conducted research, showing that the further someone lives from a transplant center, the more likely it is that they will not receive a transplant. Additionally, research has shown that once a patient is on the transplant waiting list, there is no difference in posttransplant outcomes. Thus, the real barrier appears to be access to care and a transplant center and listing for transplant. Some of the issues that patients in more rural communities may face is access to a subspecialist as well as the ability to have the social support and transportation needed for most centers to consider someone a transplant candidate. One additional factor to be considered is that providers can impact the likelihood of someone being referred and listed for transplant. One study looked at where physicians were trained—whether they were trained or did their residency or fellowship at a center that did not offer transplant. It was noted that patients, even in rural communities, who had access to a transplant-trained physician were far more likely to be referred, listed, and transplanted than patients who had a physician who had never worked at a transplant center. Finally, the MELD score at transplant widely varied owing to the organ allocation system's large variability between various local donor service areas as well as United Network for Organ Sharing regions. The recent addition of acuity circles in organ allocation was aimed to help improve this disparity.

G&H Have acuity circles actually been demonstrated to improve disparities in access to transplant?

VL I think the initial implications of acuity circles may not have had the significant benefits that we were hoping. I discussed geographic disparities on a local level, but there have also been regional and national disparities. Prior to acuity circles, there was a large disparity geographically of access to transplant based on which region someone might have lived in. There were regions where the median MELD score for liver transplant was 5 to 7 points lower than in other regions, which also ties into socioeconomic disparity. If someone could afford to fly to Florida and be listed for transplant there, they had a better chance of receiving a transplant than they might have in, for example, Los Angeles. The idea was to promote more uniform access to transplant regardless of where someone lives in the country. Studies show that the addition of acuity circles may reduce wait-list mortality but may actually increase racial disparity in particular for posttransplant outcomes. Research is ongoing regarding MELD 3.0 as well as acuity circles and the impacts they are having on disparities and access. However, these data are all preliminary. More data and fine-tuning are needed as well as taking into consideration other factors such as frailty, similar to how other solid organ transplants look at multiple factors for organ allocation rather than just the MELD score.

G&H Are there any other disparities in transplant referral patterns or evaluation processes?

VL A few other barriers have been noted. One involves the biases of the local provider. With the 6-month rule, many transplant centers would not consider someone as a transplant candidate if they could not demonstrate 6 months of sobriety. Because of multiple published studies, it is understood that 6 months of sobriety is not an independent predictor of posttransplant outcomes. Determining someone's transplant candidacy based solely on the duration of sobriety is not the standard of care. Unfortunately, that does not appear to have been embraced or may not even be known by all physicians. Thus, there are some barriers of referral for transplant just based on the disease process. An indication for transplant that is related to substance abuse may impact whether the patient is referred for transplant. Additionally, I have had some difficulty with insurance carriers. Even after my well-educated multidisciplinary team has determined, using a very detailed and thorough evaluation process, that someone is an acceptable candidate for transplant, some insurance carriers may deny financial clearance for transplant listing because they say that the patient needs 6 months of sobriety or for some other reason such as dental evaluation. With good discussion and by providing journal articles and standard of care to insurance companies, the denial may be overturned. It does take a dedicated team that is willing to fight for their patients to reverse the decision of the insurance company.

G&H Could you expand on the socioeconomic barriers in liver transplant?

VL There are many socioeconomic barriers. As mentioned, coverage is unfortunately part of someone's consideration for transplant candidacy, and there are significant financial barriers that may limit access and availability for liver transplant despite medical need and eligibility. Uninsured patients and Medicaid-covered patients are less likely to be referred as well as listed than patients with private payers. Even a step further, once the patients are listed, someone with excellent socioeconomic standing has the ability to travel and seek dual listing to increase their chances of receiving a transplant solely based on the fact that they can afford to travel to different centers and stay in hotels, and they have the support to do so. Therefore, insurance as well as socioeconomic status does impact the ability to obtain a liver. Transplant patients who are in a lower socioeconomic subset may have less support and their primary support person may have less ability to take time off from work or travel. These patients also may not have adequate housing. All of these factors may be reasons that patients are sometimes declined for transplant listing, which is unfortunate. Other health care systems across the globe provide such support and housing, but that is not routinely offered in the United States.

G&H How can all of these different barriers be separated to determine where to focus to try to make improvements?

VL That is a difficult question to answer. In my opinion, the best way is to rely on well-thought-out research to look at confounding variables. All of these factors may impact each other, both directly and indirectly. We must rely on carefully conducted research to understand which factor is the driving variable. A dedicated research effort is needed to help us understand which area should be tackled first.

G&H What other research is needed?

VL One area that deserves more attention is the impact that gender identity may have on access to transplant. Dr Tzu-Hao Lee and others have begun this important research; however, more efforts are needed toward understanding existing disparities. Currently, many providers are not asking about gender identity as part of listing criteria. We have not previously collected data on what someone's gender identity might be, so we do not know what gaps could potentially be occurring. We are seeing more struggles with both mental health and substance abuse in marginalized groups. It is important to distinguish between assigned birth sex and gender identity. Even when referencing previously performed research on gender disparities, it is not clear if the studies looking at females investigated people born female or those who identify as women. It is possible that was not specified when the research was performed. Moving forward, we need to be very careful about the data being collected to better understand the barriers that might exist so that they can be tackled.

Disclosures

Dr Loy has served as a consultant for Gilead and Ipsen.

Suggested Reading

Akabane M, Imaoka Y, Esquivel CO, Sasaki K. Has sex-based disparity in liver transplantation opportunities and waitlist mortality improved in the MELD3.0 era?: a preliminary study. *Clin Transplant*. 2025;39(1):e70064.

Bryce CL, Angus DC, Arnold RM, et al. Sociodemographic differences in early access to liver transplantation services. *Am J Transplant*. 2009;9(9):2092-2101.

Cotter TG, Mitchell MC, Patel MJ, et al. Racial and ethnic disparities in liver transplantation for alcohol-associated liver diseases in the United States. *Transplantation*. 2024;108(1):225-234.

Dakhoul L, Gawrieh S, Jones KR, et al. Racial disparities in liver transplantation for hepatocellular carcinoma are not explained by differences in comorbidities, liver disease severity, or tumor burden. *Hepatol Commun*. 2018;3(1):52-62.

Goldberg DS, French B, Forde KA, et al. Association of distance from a transplant center with access to waitlist placement, receipt of liver transplantation, and survival among US veterans. *JAMA*. 2014;311(12):1234-1243.

Ha J, Yan M, Aguilar M, et al. Race/ethnicity-specific disparities in hepatocellular carcinoma stage at diagnosis and its impact on receipt of curative therapies. *J Clin Gastroenterol*. 2016;50(5):423-430.

Lai JC, Pomfret EA, Verna EC. Implicit bias and the gender inequity in liver transplantation. *Am J Transplant*. 2022;22(6):1515-1518.

Lai JC, Terrault NA, Vittinghoff E, Biggins SW. Height contributes to the gender difference in wait-list mortality under the MELD-based liver allocation system. *Am J Transplant*. 2010;10(12):2658-2664.

Lee TH, Duong N, Sutha K, Simonetto DA, Paul S. Liver transplantation for people of minoritised sexual and gender identities in the USA. *Lancet Gastroenterol Hepatol*. 2023;8(12):1152-1162.

Loy VM, Joyce C, Bello S, VonRoenn N, Cotler SJ. Gender disparities in liver transplant candidates with nonalcoholic steatohepatitis. *Clin Transplant*. 2018;32(8):e13297.

Loy VM, Rzepczynski A, Joyce C, Bello S, Lu A. Disparity in transplant referral patterns for alcohol-related liver disease based on physician-dependent variables. *Transplant Proc*. 2020;52(3):900-904.

Mathur AK, Ashby VB, Fuller DS, et al. Variation in access to the liver transplant waiting list in the United States. *Transplantation*. 2014;98(1):94-99.

Mathur AK, Schaubel DE, Gong Q, Guidinger MK, Merion RM. Racial and ethnic disparities in access to liver transplantation. *Liver Transpl*. 2010;16(9):1033-1040.

Mathur AK, Schaubel DE, Gong Q, Guidinger MK, Merion RM. Sex-based disparities in liver transplant rates in the United States. *Am J Transplant*. 2011;11(7):1435-1443.

McElroy LM, Likhitsup A, Scott Winder G, et al. Gender disparities in patients with alcoholic liver disease evaluated for liver transplantation. *Transplantation*. 2020;104(2):293-298.

Nephew LD, Aitcheson G, Iyengar M. The impact of racial disparities on liver disease access and outcomes. *Curr Treat Options Gastroenterol*. 2022;20(3):279-294.

Nephew LD, Serper M. Racial, gender, and socioeconomic disparities in liver transplantation. *Liver Transpl*. 2021;27(6):900-912.

Okumura K, Dhand A, Misawa R, Sogawa H, Veillette G, Nishida S. The effects of acuity circle policy on racial disparity in liver transplantation. *Surgery*. 2023;174(6):1436-1444.

Rinella NS, Charlton W, Reddy G, McLean Diaz P, Charlton MR. Current burden of and geographic disparities in liver mortality and access to liver transplant. *JAMA Netw Open*. 2024;7(10):e2439846.

Volk ML, Choi H, Warren GJ, Sonnenday CJ, Marrero JA, Heisler M. Geographic variation in organ availability is responsible for disparities in liver transplantation between Hispanics and Caucasians. *Am J Transplant*. 2009;9(9):2113-2118.