The effect of alcohol and eligibility for liver transplant: a critical review

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Abstract
Background: Alcohol-related liver disease (ALRD) has emerged as a significant global health concern, primarily attributed to the overconsumption of alcohol. While alcoholism has the potential to impact various organs, it is the liver that is especially vulnerable.

Methods: This review comprehensively examines the challenges encountered during the pre-transplant, intra-transplant, and post-transplant phases, a significant number of which are attributable to alcohol misuse. Historically, liver transplant (LT) programmes have excluded patients with alcohol-related liver disease (ARLD) due to mandatory abstinence requirements and apprehensions regarding potential graft shortages for other hepatic diseases. This review counters these concerns by highlighting the minimal usage of grafts for early liver transplantation. It strongly advocates for the incorporation of severe alcoholic hepatitis into the model for end-stage liver disease allocation, devoid of any stigmatization. The selection of ARLD individuals for LT necessitates the critical involvement of a multidisciplinary team, inclusive of addiction specialists.

Results: Despite the complexities associated with LT for patients with ARLD, this review underscores its therapeutic advantages, particularly for those anticipated to experience severe adverse effects. This review accentuates the necessity of ensuring equitable access to medical interventions for all patients, irrespective of their lifestyle choices.

Conclusion: The examination of genetic and epigenetic variables that play a role in the onset and advancement of ALD. The identification of potential therapy strategies is also an important area of study. The formulation of intricate eligibility rules for LT in patients with a past of alcohol abuse needs essential interactions between medical practitioners and researchers. The use of new technologies such as genomics and epigenomics could boost the accuracy of ALD diagnostic and prognostic approaches. These targeted investigations could potentially lead to major improvements in the management and treatment results of ALD.

Keywords: abstinence criteria, alcohol-related liver disease (ALRD), liver transplantation (LT)

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Background

Liver transplantation (LT) is a potentially life-saving procedure that is indicated for people with alcohol-related liver disease (ARLD). Patients with ARLD were previously excluded from LT programmes due of the abstinence restriction. However, groundbreaking study by Thomas Starzl et al. (1988) discovered that patients with ARLD who had LT had a 73% one-year survival rate. This study resulted in ARLD being accepted as an indication for LT, making it a viable therapy option for ARLD patients [1]. Additional ethical concerns have been raised about the potential of unrestricted access to transplantation, which may exacerbate the graft scarcity for other aetiologies, as recognising ARLD as an indication of LT may further limit an organ pool [2]. This worry, however, is unjustified, as early liver transplantation accounts for only 5–10% of grafts. Furthermore, in the model for end-stage liver disease allocation, giving other causes precedence over severe alcoholic hepatitis (AH) is unethical and stigmatises people with alcohol-related liver disorders [3]. Furthermore, public perception has remained neutral, and AH, liver transplantation accounts for only 1% to 3% of all donor livers used [4]. AH is viewed as a self-inflicted disease, whereas persons with viral hepatitis and nonalcoholic steatohepatitis view LT differently. Patients with AH who are considering LT may face ethical problems as a result of this mindset [5]. The French liver transplant agreement strongly recommends transplantation in individuals with severe AH who have not responded to conventional treatment [6].

In the past, the majority of LT centers in the United States demanded a minimum of six months of abstinence before considering LT as an option for treating ARLD. This time of abstinence is meant to facilitate possible liver function improvement and prevent premature transplantation [7]. Since its introduction, the 6-month rule has been employed as a proxy for forecasting an alcohol relapse; nevertheless, survival, sobriety, and compliance do not correlate with the six months following LT [8]. When considering these individuals for LT, ethical considerations must be taken into account, and patients with self-inflicted diseases should have equal access to medical resources. This review examines the effects of alcoholism on the liver, the criteria that influence eligibility for transplantation, and the ethical considerations surrounding the decision to transplant in individuals with alcohol-related liver disease, as well as providing a comprehensive overview of the topic and suggesting potential areas for future research.

The Role of alcoholism in the development of liver diseases

This review encompasses an extensive exploration of databases such as PubMed, Scopus, and Web of Science. The search strategy employs keywords such as “alcohol-related liver disease,” “liver transplantation,” and “alcoholism,” with a focus on publications available from 2015 to the present. The inclusion criteria comprise studies investigating the impact of alcohol on the liver, liver transplantation procedures in patients with alcohol-related liver disease, and recent advancements in therapeutic approaches. Conversely, the exclusion criteria are designed to filter out studies that are not pertinent to the topic or those that do not meet the requisite quality standards.

Definition of alcoholism

For ages, alcohol consumption has been a popular habit in numerous societies. However, its hazardous usage has enormous social and economic repercussions, resulting in a high disease burden [9]. The harmful effects of alcohol consumption include its role in causing more than 200 health conditions, including mental and behavioral disorders, major noncommunicable diseases, and injuries, with the impact on chronic and acute health outcomes being largely determined by the total volume and pattern of drinking, particularly episodes of heavy drinking [10]. Alcoholism, the most severe form of problem drinking, is characterized by physical reliance on alcohol, signs of alcohol misuse, and a physical compulsion to consume alcohol. It is considered both a medical and mental condition, with alcohol use disorder and alcohol dependence being the most common diagnostic labels [11]. Alcohol abuse can damage many organ systems, but the brain, heart, liver, pancreas, and immune system are most susceptible [12]. In general, women are more susceptible to the adverse effects of alcohol than men [13]. Age, gender, family circumstances, and socioeconomic level are among the risk variables contributing to developing alcohol-related issues. The likelihood of having alcohol-related issues is increased by vulnerabilities resulting from linked factors, such as genetics, upbringing, social environment, and emotional health [14]. Anxiety and stress, as well as the availability and affordability of alcohol, are additional risk factors [15]. Those who have a family history of alcoholism, hang out with heavy drinkers, or have mental health concerns are at a higher risk. Furthermore, some racial groups are more vulnerable than others, such as American Indians and Native Alaskans [16].

Description of how alcohol affects the liver

Chronic alcoholism leads to fatty liver disease, which can proceed to cirrhosis and, eventually, hepatocellular carcinoma [17]. Excessive alcohol consumption can cause liver damage and alcoholic liver disease ALD via several routes [18]. Alcohol is absorbed and metabolised in the liver, resulting in alterations to the gut microbiome, gut epithelial integrity, and substantial nutritional deficits. In hepatocytes, alcohol dehydrogenase turns alcohol to acetaldehyde, which is then converted to acetate by aldehyde dehydrogenase. Acetate is easily removed in peripheral tissue after being converted to water and carbon dioxide [19]. However, a limited amount of alcohol is metabolised to acetaldehyde by the MEOS via the cytochrome P450 (CYP) enzyme CYP2E1, resulting in reactive oxygen species [20]. By creating potentially immunogenic adducts with lipids, proteins, and DNA, acetaldehyde synthesis contributes to liver damage [21]. These adducts can trigger an adaptive immune response, resulting in liver injury and inflammation. Chronic alcohol consumption causes CYP2E1 to be activated, resulting in the generation of reactive oxygen species, which causes oxidative stress that binds to proteins and DNA, eventually leading to hepatocyte apoptosis and necrosis [21]. In addition to lipid buildup in hepatocytes, ethanol-derived metabolites can promote inflammation, steatosis, fibrosis, and carcinogenesis [22]. Chronic excessive alcohol consumption compromises the liver's antioxidant clearance system due to an acetaldehyde-mediated reduction in glutathione [18]. Many hypotheses have been proposed to explain how alcohol induces carcinogenesis in the liver, including the carcinogenic action of ethanol-derived acetaldehyde-forming protein and ALD-specific DNA adducts [23]. Figure 1 depicts an overview of alcohol's effects on the liver.

Overview of liver disease caused by alcohol abuse

Three types of alcoholic liver disease have been identified: AH, alcoholic fatty liver, and alcoholic cirrhosis (AC) [17]. Although patients typically exhibit a combination of all three types of symptoms, the classification aids in prognosis and treatment. Hepatic steatosis is a reversible disorder that can occur after high alcohol consumption within a few days [24]. Heavy drinkers who have used alcohol for 10 to 20 years are susceptible to developing AC, a severe and irreversible form of the disease [25]. However, sensitive individuals, such as women or those who take more than 80 grams of alcohol per day, may have major liver damage much early [25]. About 40% of heavy alcohol consumers develop AH, which is an
intermediate stage in the progression of cirrhosis. It is a dynamic, potentially reversible inflammatory illness that can be rather severe [26]. Changes in mental state, hepatomegaly, jaundice, and malabsorption are all symptoms of liver disease [25]. In addition to elevated liver enzymes, macrocytosis, and thrombocytopenia, alcoholic liver disease is frequently accompanied by macrocytosis and thrombocytopenia [27]. The presence of a prolonged prothrombin time, hyperbilirubinemia, and encephalopathy are indicative of a more severe form of the disease, with greater morbidity and death [21]. Hepatorenal syndrome is virtually usually deadly, but malabsorption and malnutrition may result from a variety of reasons. Furthermore, alcohol-induced pancreatitis and diabetes are potential consequences [28].

**Eligibility for liver transplantation**

LT is a potentially life-saving procedure that can cure or prolong the lives of individuals suffering from acute liver failure, severe cirrhosis, hepatocellular cancer, or hereditary metabolic disorders. Recent developments in surgical procedures, organ preservation, procurement, and immunosuppression have resulted in remarkable improvements in post-transplant patient mortality, graft survival, and quality of life [29]. Modern LT is now considered a long-term surgical intervention and the therapy of choice for a range of illnesses that severely impair liver function [30].

Despite the amazing successes linked with LT, the significant burden of severe liver disease and the resulting organ donor shortage remains a significant barrier. In the United States, over 6,000 liver transplants are performed each year, with 7,841 accomplished in 2016 alone [31]. Despite this, there are currently over 14,000 people on the transplant waiting list, and over 3,000 people die or are delisted each year due to serious illness that hinders transplantation [31]. Figure 2 depicts the concepts that guide the selection of Liver Transplant patients from the time the patient is diagnosed with end-stage liver disease to the time the patient undergoes LT.

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**Figure 1** An overview of how alcohol affects the liver

**Figure 2** Principles of patient selection for liver transplantation
Figure 3 depicts a flowchart of the criteria for LT in individuals with various liver disorders. This disparity in supply and demand emphasises the importance of a patient selection system that balances the goals of benefit, justice, and fairness.

Several principles guide the identification of candidates for liver transplantation [32]. To begin, the recipient must have acute or chronic irreversible liver disease that is expected to be fatal in the absence of transplantation (Figure 2). Second, the patient must have enough reserves to make it through the surgery and perioperative periods. Finally, the applicant should expect significant improvements in longevity and quality of life following a liver transplant [31, 33]. Patients must meet certain criteria in order to be considered for a liver transplant (Figure 3). They must have clinical evidence of liver failure or primary liver cancer, be in good enough health for surgery and recovery, and represent no risk of future alcohol or drug abuse. The model for end-stage liver disease or Paediatric End-Stage Liver Disease scoring system is used to assess the waiting list for liver transplants, which takes into consideration bilirubin, prothrombin time, creatinine, and albumin to determine how well the liver is performing [34]. Other factors, such as secondary diseases and problems that increase a patient's requirement, can increase their score. If the patient has primary liver cancer, the healthcare professional calculates the patient’s probability of death based on tumour size and length of observation [35].

Transplantation eligibility issues for alcohol abusing individuals

Because there is no artificial equivalent for the liver, liver transplantation is the final treatment for saving the lives of individuals with end-stage liver disease. Unfortunately, organ shortages prevent many people from receiving treatment. Although disease-specific entrance restrictions are widely accepted for the vast majority of reasons, the selection of alcoholic patients for liver transplantation is still a contentious issue [36]. Many of these patients’ pre-, intra-, and post-transplant issues are exacerbated by alcoholism. The gold standard for examining these persons is a multidisciplinary team that includes an addiction specialist. Regardless of the specialist’s assessment, a few clinics propose a six-month abstinence period [37]. A month of abstinence before to transplantation is medically advised since it can significantly improve liver function. The mandatory abstinence period does not accurately predict post-transplant abstinence, compliance, or the probability of relapse. Furthermore there are no national or international guidelines on the length of abstinence for liver transplantation. Six months is the most commonly used cutoff period, yet it is arbitrary and unsupported by research.

According to alcoholism research conducted outside of the context of liver transplantation, persistent sobriety does not occur until five years of extended abstinence have elapsed [38]. Identifying protective and/or negative prognostic variables for alcoholics necessitates the expertise of a substance abuse expert [39]. A poor prognosis is related with social isolation, a family history of alcoholism, recurrent attempts at rehabilitation, uncontrolled polysubstance use, and unstable personality disorders. A possible liver transplant patient who has social support, sources of better self-esteem, and an optimistic attitude, on the other hand, is more likely to have a positive outcome [40]. For identifying persons at high risk of recurrence, a multidisciplinary strategy comprising evaluations by a medical expert and an addiction specialist is crucial.

Individuals with alcoholic liver disorders have sparked more controversy than any other transplant indication. Abstinence is essential both before and after a liver transplant. Continued intoxication following transplantation is linked to noncompliance with immunosuppressive therapy, direct hepatotoxic effects, graft loss, and death. Nonetheless, there is no proof for any of these ailments at this time. Furthermore, no convincing rationale has been provided for a predetermined period of abstinence prior to liver transplantation. The legitimacy of the six-month term has been called into question because it is based on custom and practise rather than on future occurrences. Nonetheless, abstinence may be essential to promote rapid recovery and give specialists adequate opportunity to connect with patients and examine the probability of post-transplant complaisance [41]. Malignancy screening is routine practise before listing for transplantation, and the majority of hospitals adhere to set guidelines. Long-term follow-up is the most difficult aspect of liver transplantation for AC. Despite routine monitoring, these individuals require unique surveillance measures, notably for oropharyngeal and pulmonary cancer screening. The most critical challenge is implementing a psychological surveillance system for sobriety in order to detect and manage alcohol relapse early and minimise organ damage. Only a few hospitals provide long-term psychiatric surveillance after transplantation due to limited resources and the potential that patients are not tracked at the transplant centre [40].

LT for alcoholic liver disorders is a complex and contentious topic due to the complications of transplant issues, many of which are caused by alcohol usage. Although abstinence prior to donation is medically beneficial, the mandated six-month abstinence interval is arbitrary and data Unsupported. Identifying those who are at high risk of relapse requires a multidisciplinary approach that includes medical and addiction specialist assessments.

![Figure 3 Criteria for liver transplantation](https://www.tmrjournals.com/ghr)
Liver disease | Outcome
--- | ---
SAH and AC | Patient and graft survival: outstanding 1-year outcomes comparable to those observed in patients who received transplants after 6 months of sobriety; Alcohol relapse: comparable in both groups (Weeks et al., 2018).
SAH | Early liver transplantation improved survival in patients with severe alcoholic hepatitis, with a cumulative 6-month survival rate of 77% compared to 23% in the non-transplant group; The benefit of early transplantation was sustained over two years of follow-up; Just three patients started drinking alcohol following transplantation: one at 720 days, one at 740 days, and one at 1140 days (Mathurin et al., 2011). Most patients survived 1 year (94%) and 3 years (84%) after a liver transplant for severe alcoholic hepatitis, similar to patients having liver transplants for other causes;
SAH | Continued alcohol use after liver transplant was uncommon but was associated with an increased risk of death; (Lee et al., 2017). Patients offered early liver transplantation had an estimated average life expectancy of 6.55 life years, compared to 1.46 life years for patients offered delayed liver transplantation;
SAH | Patients with sustained alcohol use after transplantation had a significantly lower life expectancy than those without; (Lee et al., 2018).
SAH | No difference in alcohol relapse rate between early and standard transplantation;
SAH | Similar 2-year post-transplant survival between early and standard transplantation groups; Higher 2-year overall survival in early transplantation group than those not eligible for early transplantation and historical controls (Louvet et al., 2022).
SAH | Six-month and 2-year survivals of LT patients were better than that of non-transplanted matched controls: 77% vs 23% and 71% vs 23% respectively; Alcohol relapse occurred in 12% of patients after early LT (Artru et al., 2017).
SAH | Early liver transplantation improved survival in SAH patients who did not respond to medical therapy; Of the 16 patients who received LT, two resumed alcohol consumption at 164 and 184 days, respectively (Germani et al., 2022).
SAH | Patient and graft survival rates were 100%, and only 1 of the 10 patients (10%) returned to harmful drinking (Sundaram et al., 2018).
SAH | One-year and three-year patient survival rates after LT were both 92.5 %. The overall and sustained relapse rates to alcohol following LT were 10.3% and 3.5%, respectively (Zanowksi et al., 2022).

SAH, severe alcoholic hepatitis; AC, alcoholic cirrhosis.

Recent liver transplantation studies in alcohol-related liver disease patients

Numerous studies have been conducted to determine the efficacy of liver transplantation in patients with ARLD (Table 1). The first trial included liver transplant patients with acute AH and AC. Individuals with acute AH had a 100% six-month survival rate, whereas individuals with AC who had not consumed alcohol for at least six months had an 89% six-month survival rate. Nonetheless, both groups had high rates of recurrence to risky drinking [42]. According to research, the cumulative 6-month survival rate for individuals with severe AH who received an early liver transplant was 77% [43]. The transplant group had a cumulative 6-month survival rate of 75%, while the non-transplant group had a rate of 23%. The benefits of early transplantation continued after two years of follow-up. Following transplantation, three individuals only began drinking again. Sharon R. Weeks et al. discovered in a subsequent trial that liver transplant outcomes for patients with severe AH were equal to those of patients who had transplants after at least six months of sobriety. The study also discovered that the 6-month patient outcome prediction guideline for alcoholic liver disease following liver transplantation may not be necessary [44]. Lee et al. investigated the outcomes of people with severe AH who received an early liver transplant. The majority of patients who underwent early liver transplantation survived 1 year (94%) and 3 years (82%), similar to those who underwent liver transplantation for other reasons. In frequent alcohol use after a liver transplant was associated with an increased risk of death [45]. LT is a common and effective treatment for advanced liver disease. Patients with ALD are among the most common users of this therapy method. Despite concerns about the risk of relapse after transplantation, research suggests that ALD patients have excellent post-transplant survival rates [46]. The percentage of ALD patients who relapse to any quantity of alcohol consumption after LT ranges from 8 to 20% one year after transplantation and jumps to 30–40% five years later. Despite this, a number of studies have shown that over 80% of ALD patients consume no or little alcohol during long-term follow-up [47]. The reported rates of alcohol intake following liver transplantation differ from study to study due to the several categories utilised to determine repeated drinking. Existing research links a reduction in alcohol consumption to a reduction in overall morbidity, mortality, and health-care costs, as well as an improvement in psychosocial status. Furthermore, subsequent research has shown that only heavy or chronic alcohol consumption is detrimental to graft and long-term liver disease-related mortality in ALD transplant recipients [48].

When studying the long-term effects of LT, researchers and physicians take into account graft survival as well as the patient's quality of life. The graft-survival rate of patients with ALD was found to be equivalent to that of individuals without ALD. ALD patients have superior 1 and 3-year graft survival rates than those with any other condition treated with LTs [49]. The prevalence of concurrent hepatitis C (HCV) infection does not appear to affect the 1, 3, or 5-year graft-survival rates of ALD patients [50]. Patients with ALD and HCV infection who underwent LT, on the other hand, had a higher risk of developing hepatic fibrosis than those with ALD or HCV infection alone [51].

There have been few retrospective studies on abstinent people who received LT for ALD. In comparison to patients with AC alone, the presence of alcohol-induced hepatitis had no effect on these people's survival and relapse rates [6, 46]. The survival rates of patients with advanced ARLD who had access to LT have consistently increased over the last decade. In fact, they are currently at least as excellent as, if not better than, other LT indications such hepatocellular carcinoma and HCV-related cirrhosis with decompenstion. The 1, 5, and 10-year...
survival rates are 85%, 74%, and 59%, respectively. Despite these findings, the risk of relapse after LT remains the principal barrier to obtaining LT for patients with ARLD in many regions [6].

Recent studies have shown that in carefully selected patients, early LT for severe AH can result with excellent clinical outcomes, minimal donor pool injury, and lower relapse rates. Patients who had early LT (before 6 months of abstinence) for severe AH lived for 1 to 3 years, similar to those who received LT for other reasons. In the aftermath of LT, infrequent alcohol consumption was connected to increased mortality. These findings lend support to the selective use of LT in the treatment of severe AH. Patients with severe AH who do not respond to corticosteroid therapy may benefit from LT [48]. Al-Saeedi et al. investigated the effects of liver transplantation in people with severe acute AH and chronic AC who had previously only received medication. After one year, the data showed that liver transplantation significantly increased patient survival compared to medical treatment alone. Furthermore, the incidence of relapse after liver transplantation was not raised in a sample of persons [52]. In a study conducted in 2022, researchers compared the likelihood of alcohol relapse two years after liver transplantation for severe alcohol-related hepatitis with liver transplantation for alcohol-related cirrhosis after at least six months of abstinence and found no evidence of non-inferiority between early and regular transplantation in terms of the rate of alcohol relapse following transplantation [53].

Nonetheless, 2-year post-transplant survival was comparable between the early and conventional transplantation groups, and 2-year overall survival was higher in the early transplantation group than in the standard transplantation group and historical controls [53]. These findings suggest that for persons with severe AH who do not respond to pharmaceutical treatment, liver transplantation may be an option. However, the possibility of alcohol relapse after transplantation remains a worry, with prior abstinence and duration of abstinence remaining key predictors of post-transplant relapse. More research is needed to assess the long-term prognosis of liver transplantation in people with severe AH to find predictors of good results.

The benefits and hazards of liver transplantation in patients with alcoholic liver disease. ARLD can be effectively treated with LT. Post-transplant survival rates for people with severe AH and AC who had LT were positive, according to studies. Acute AH patients had a 100% 6-month survival rate, whereas AC patients who had been abstinent for at least six months had an 89% survival rate. However, both groups saw relapse rates for problematic drinking [54]. Despite worries about the risk of relapse to alcohol use after LT, existing data show that reducing alcohol use is associated with a reduction in overall morbidity, mortality, and health expenditures, as well as an improvement in psychosocial status [47]. Recurrent drinking following LT in ALD patients ranges from 8 to 20% at 1 year to 30–40% at 5 years. Long-term follow-up studies, however, show that more than 80% of ALD patients consume no or little alcohol [55]. LT may benefit patients with severe AH who do not respond to corticosteroid therapy [45]. Although continuing alcohol use following LT is unusual, it is linked to an increased risk of death. In many places, the risk of relapse following LT remains the most major obstacle to ARLD patients receiving LT. Early LT for severe AH can result in excellent clinical results, minimal donor pool damage, and low relapse rates in well-selected patients [48, 56].

Alcohol abuse and liver transplantation ethics

LT in a patient who has a history of alcoholism raises several ethical difficulties. Among the most pressing ethical concerns are:

Resource allocation

LT is a life-saving operation for people with end-stage liver disease. Unfortunately, due to the scarcity of donor livers, transplant institutions are forced to make difficult allocation decisions. The question of whether persons with a history of alcohol consumption should be given preference over other candidates for LT is frequently questioned [57].

Patients with ARLD are consistently rated as less transplant-worthy in polls conducted in both the United States and the United Kingdom. This could be because cirrhosis is a stigmatised disease that affects those with lower socioeconomic level disproportionately [58]. Others, however, argue that ARLD patients are distinguished from other liver failure patients by their ability to assume at least some personal responsibility. According to this idea, people who abuse alcohol are responsible for their liver disease and so have a lower claim to a liver transplant than individuals who had no role in the development of liver disease. However, this argument is faulty since it unfairly discriminates against a vulnerable population that may die if they do not obtain a liver transplant. Refusing someone a liver transplant because they have a history of drinking is the same as punishing them for their past behaviour rather than prioritising them based on their medical requirements. This is immoral and unjust behaviour. Third, individual accountability can be linked to a wide range of healthcare conditions. Individuals with nonalcoholic steatohepatitis, for example, are more likely to be overweight or obese, as well as to have diabetes, all of which may be considered to have a strong personal responsibility component in its onset as well as management [59]. However, there is little discussion of personal responsibility for their health problems, nor is there a plea for such individuals to be moved lower on the transplant waiting list.

The concept is that social desirability assessments should not be used as a transplant allocation factor. Allocating organs based on personal responsibility may pose ethical concerns, and many other factors, such as medical urgency, the patient's overall state, and the likelihood of transplant success, should be taken into account when making allocation decisions.

Stigmatization

ARLD is a dangerous health disorder that affects those who have previously abused alcohol. Unfortunately, patients with ARLD are frequently stigmatised and discriminated against, which can have a poor impact on their healthcare results [60]. Stigma and prejudice can manifest themselves in a variety of ways, including public stigma, self-stigma, and structural stigma. These types of stigmata contribute to a failure to seek treatment, a delay in getting help, and poor healthcare, all of which can lead to poor health outcomes and an increased burden of ARLD. This is especially concerning because persons with ARLD frequently require access to restricted resources, such as liver transplantation, and discrimination in the allocation of these resources can have fatal effects [61].

The attribution of blame to persons with ARLD is crucial to the stigma associated with the condition. This blame game has the potential to have ramifications for all aspects of ARLD care, from prevention and early detection to intervention and resource allocation. ARLD patients must be empowered to lead the fight against stigmatisation of ARLD patients. To address stigma in ARLD healthcare, a multifaceted approach will be required. Some solutions for combating stigma include the dissemination of a dynamic model of individual and social responsibility for alcohol use disorder, a continuum model of hazardous alcohol use, and the provision of training on ARLD-related stigma for healthcare professionals. It is also critical to integrate addiction and ARLD services, provide stigma-free prevention, and eliminate the frequent separation of addiction treatment from general healthcare. Improving outcomes for all people with ARLD requires tackling social disparities, addressing the social components of ARLD risk and outcomes, and providing equal access to services. Discrimination and stigma have no place in modern healthcare and must be eradicated, especially for patients with ARLD.

Medical futility

LT is critical for individuals with end-stage liver disease caused by alcohol abuse. However, it is not a guaranteed cure. There is a risk
that individuals may continue to abuse alcohol after the transplant, which can lead to the failure of the new liver. Transplant centers must carefully weigh the potential benefits of transplantation against the risk of medical futility [62]. Long-term post-transplant monitoring is one of the greatest obstacles in alcoholic liver disease LT. Despite routine monitoring, special surveillance techniques must be developed for these recipients, especially in terms of oropharyngeal and pulmonary cancer screening. However, the establishment of a psychological monitoring protocol for sobriety represents the greatest obstacle. This is necessary for the early detection and treatment of alcohol relapse, preventing organ damage. Due to limited resources and the possibility that patients are not followed at the transplant center, only a small number of facilities offer long-term psychiatric surveillance after transplantation.

Lifelong medical and psychological care is the most essential aspect in deciding the success of LT for alcoholic liver diseases. While the pre-transplant selection is vital, post-transplant surveillance is much more so. The patient's general health and transplant success are dependent on the prevention and treatment of alcohol relapse, which can damage the new liver [41]. Thus, transplant facilities must adopt efficient psychological surveillance methods for sobriety in order to detect alcohol relapse early and intervene expeditiously. These ethical issues must be carefully considered in the decision-making process for liver transplantation in individuals with a history of alcohol abuse. Transplant centers must balance the potential benefits of transplantation against the risks and ensure that allocation decisions are fair and equitable. Additionally, there is a need for education and destigmatization around alcohol abuse to ensure that individuals with a history of alcohol abuse are not unfairly discriminated against in the allocation of resources.

**Limitations of the study**

The review has a few limitations that need to be acknowledged. Firstly, the author's personal views and opinions on the subject may not represent a balanced and consensus view of the current literature and evidence. This bias may also skew towards favoring liver transplantation for individuals with ARLD, and the review may not explore alternative viewpoints or counterarguments in-depth.

Furthermore, the study focuses solely on liver transplantation as a therapy method for ARLD, potentially overlooking other liver illnesses and medications. Furthermore, because the study focuses on English, pertinent studies and literature produced in other languages may be overlooked.

Finally, several of the studies included in the analysis had small sample sizes or methodological issues that could have impacted the results' dependability and accuracy. It is crucial to remember these limitations when understanding the review's results.

**Conclusion**

The consumption of alcohol is recognised to have detrimental impacts on the functioning and composition of the liver, resulting in a range of disorders including AH, cirrhosis, and steatosis. In instances of extreme severity, liver failure may manifest, hence requiring a liver transplantation procedure. Nevertheless, there is a significant amount of disagreement surrounding the use of transplantation as a treatment for ARLD, specifically in relation to the requirement of abstinence both before and after the procedure. This is because of worries regarding the possibility of treatment non-compliance and the recurrence of alcohol addiction, which might result in graft loss or even mortality. In the United States, numerous LT centres require a 6-month term of refraining from alcohol before contemplating LT for patients with ARLD. Nevertheless, this timeframe has been scrutiny for being an arbitrary indicator in forecasting alcohol relapse and does not necessarily align with patient longevity or adherence. When considering whether to provide LT to patients with ARLD, it is important to examine ethical factors, specifically ensuring equitable access to medical resources for individuals with diseases caused by their own actions. In spite of the difficulties and disputes, liver transplantation ultimately remains a potentially life-saving alternative for those suffering from end-stage liver disease.

In order to understand the complexities of ARLD, further research is necessary to grasp the genetic and epigenetic variables that contribute to the onset and advancement of ARLD, as well as to identify potential treatment approaches. This could result in the creation of more effective treatments for this challenging medical condition. Also, collaborations between clinicians and scientists are necessary to develop more complex eligibility criteria for liver transplantation in patients with a history of alcohol misuse. Finally, to enhance the precision of existing tools for the diagnosis and prognosis of ARLD, future studies should focus on utilizing advanced technologies such as genomics and epigenomics.

The examination of genetic and epigenetic variables that play a role in the onset and advancement of ARLD. The identification of potential therapy strategies is also an important area of study. The formulation of intricate eligibility rules for LT in patients with a past of alcohol abuse needs essential interactions between medical practitioners and researchers. The use of new technologies such as genomics and epigenomics could boost the accuracy of ARLD diagnostic and prognostic approaches. These targeted investigations could potentially lead to major improvements in the management and treatment results of ARLD.

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