BMC Public Health

RESEARCH

Open Access

Global prevalence, incidence, and outcomes of alcohol related liver diseases: a systematic review and meta-analysis

Xuanxuan Niu[1], Lin Zhu[1], Yifan Xu[1], Menghan Zhang[1], Yanxu Hao[1], Lei Ma[1], Yan Li[1] and Huichun Xing[1,2*]

Abstract

Background Alcohol related liver disease (ARLD) is one of the major chronic liver diseases worldwide. This review aimed to describe the global prevalence, incidence, and outcomes of ARLD.

Methods Medline, Embase, The Cochrane Library, and China National Knowledge Infrastructure (CNKI) were searched from inception to May 31, 2022. The language was restricted to English or Chinese. According to the criteria, articles describing the basic characteristics of the population were selected. Two reviewers extracted the data independently.

Results A total of 372 studies were identified: 353 were used for prevalence analysis, 7 were used for incidence analysis, and 114 were used to for outcome analysis. The prevalence of ARLD worldwide was 4.8%. The prevalence in males was 2.9%, which was higher than female (0.5%). Among the ethnic groups, the percentage was highest in Caucasians (68.9%). Alcoholic liver cirrhosis comprised the highest proportion in the disease spectrum of ARLD at 32.9%. The prevalence of ascites in ARLD population was highest (25.1%). The ARLD population who drinking for > 20 years accounted for 54.8%, and the average daily alcohol intake was 146.6 g/d. About 59.5% of ARLD patients were current or former smokers, and 18.7% were complicated with hepatitis virus infection. The incidence was 0.208/1000 person-years. The overall mortality was 23.9%, and the liver-related mortality was 21.6%.

Conclusion The global prevalence of ARLD was 4.8% and was affected by sex, region, drinking years, and other factors. Therefore, removing the factors causing a high disease prevalence is an urgent requisite.

Trial registration PROSPERO Nr: CRD42021286192

Keywords Alcohol related liver diseases, Epidemiology, Prevalence

Background

According to *Global Status Report on Alcohol and Health 2018* [1], about 2.3 billion people are drinking alcohol worldwide currently, and more than half of the population in the USA, Europe, and the Western Pacific consumes alcohol. Chronic heavy drinking is the etiology or risk factor for many diseases, such as alcohol related liver diseases (ARLD), acute pancreatitis, and alcohol-related cardiomyopathy [2]. A study showed a 2.1-fold increase in deaths from alcohol poisoning between 2000 and 2019 in USA [3]. According to the WHO data, the

*Correspondence:
Huichun Xing
hchxing@sohu.com; hchxing@ccmu.edu.cn
[1] Center of Liver Diseases Division 3, Beijing Ditan Hospital, Capital Medical University, 8 Jingshundong Street, Chaoyang District, Beijing 100015, China
[2] Peking University Ditan Teaching Hospital, Beijing 100015, China

global number of deaths caused by alcohol was about 3 million in 2016. Among them, the deaths caused by alcohol-related digestive diseases accounted for 21.3% of all diseases with highest proportion [1]. The total number of deaths was 637,000, including 607,000 cases of ARLD [1]. Therefore, ARLD has become one of the major causes of alcohol-related death.

Due to the popularity of hepatitis B vaccine and the effective application of antiviral therapy worldwide, the status of the HBV as the main cause of the chronic liver disease is declining gradually [4], while alcohol has gained increasing attention. A study [5] showed that the global prevalence of chronic liver diseases due to alcohol use increased by 3.73% between 2005 and 2015. The prevalence of alcoholic liver cirrhosis in cirrhosis population was increased by 43% in 7 years in the USA [6]. The number of deaths from ARLD in South Korea increased from 1403 to 3588 between 2000 and 2009 [7]. These studies suggested that the burden of ARLD is increasing gradually. Therefore, understanding the epidemiology of ARLD is essential to formulate the relevant prevention and control policies.

However, the current epidemiological data on ARLD were obtained from small-scale research. There is no global consensus. In addition to alcohol consumption as a direct factor of liver injury [8, 9], region, gender [10], race, smoking, and other factors have an impact on the prevalence of ARLD. Thus, this meta-analysis described the characteristics of ARLD population in epidemiology, which could help improve the healthcare strategies and reduce the global prevalence of the disease.

Methods

This meta-analysis of observational studies was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) and registered in PROSPERO.

Search strategy and selection criteria

Pubmed, Embase, The Cochrane Library, and CNKI, were searched using the keywords "Liver Diseases, Alcoholic", "Alcoholic Liver Diseases", "Alcoholic Liver Disease", and "Liver Disease, Alcoholic". The details are described in the Supplementary Table 1. Studies published from the respective inception dates of the databases to May 31, 2022 were eligible for inclusion in this meta-analysis. The language of the literature was limited to English or Chinese.

Data extraction and quality assessment

Two reviewers searched the studies and extracted the data independently. Any disagreements on the eligible studies and data extraction were resolved by consensus and/or discussion with a third author. The included literature is listed in the Supplementary Tables 2, 3, 4 and 5. Newcastle–Ottawa scale was used to evaluate the quality of the studies, ranging from 0–9: 7–9 represented a high-quality score, 4–6 represented a medium score, and 1–3 represented a low score. Studies with scores < 4 were excluded.

Study definitions

ARLD is a series of liver injuries caused by long-term high-alcohol intake, including mild alcoholic liver disease, alcoholic fatty liver disease, alcoholic hepatitis, alcoholic cirrhosis, and related complications [11]. ARLD was diagnosed according to long-term drinking history or short-term heavy drinking history, without autoimmune hepatitis, drug-induced liver diseases, or other genetic disorder related liver diseases. It should be evaluated though blood biochemical testing, ultrasound, transient elasticity, CT, MRI, and biopsy [12, 13]. The concrete situation was determined based on the latest diagnostic criteria of the corresponding year. The general population without defined diseases was referred to the physical examination at the health care center and participated in the epidemiological survey. Original research articles that defined their population as ARLD and/or general population were included. Including studies should also provide the data on the prevalence, incidence and outcomes of ARLD. Study designs with unrestricted types were eligible for inclusion. In case of duplicate data, the largest and latest datasets were selected. Articles were excluded if the diagnosis of ARLD were unclear; the number of participations were < 50 in the baseline; age < 18-years-old; the study population was limited to either one gender; specific groups with other chronic diseases, such as non-alcoholic liver disease, drug-induced liver disease, and acquired immune deficiency syndrome.

Data analysis

The incidence of ARLD was studied in the general population at baseline without the disease. To estimate the incidence, we used the number of new cases and the follow-up time (person-years). The baseline characteristics of ARLD population, including prevalence, mortality, and cause of death, were described. In order to study the influencing factors of prevalence, we analyzed region, sex, race, disease severity, complications, drinking years, smoking, virus infection, and other factors. Moreover, the global prevalence was compared between 2000–2010 and 2011–2021.

Statistical analysis

Cochran Q and I^2 statistics were used to assess the heterogeneity. p-value < 0.05 in Q-statistic and $I^2 \geq 50\%$ were

considered moderate or severe heterogeneity. Due to the heterogeneity of global data, random-effects model was applied to analyze each study dataset. Funnel plot and Egger's test (the figures of main result are listed in Supplementary Figs. 1– 5) were used to evaluate the publication bias. All statistical analyses were conducted using Meta package in Stata statistical software.

Results

Study selection and characteristics

According to the above-defined search terms in methods, 64,321 studies were retrieved, and 368 studies were included according to the inclusion criteria. While searching for relevant articles, four additional studies were added. Finally, 372 articles were included: 353 studies for prevalence analysis, 7 for incidence analysis, and 114 for outcome analysis (some studies provided data on prevalence, incidence and/or outcomes at the same time; hence, the total number was different from the sum of subgroups) (Fig. 1).

Prevalence of ARLD

The overall prevalence of ARLD in general population was 4.8% [95% confidence interval (CI): 4.1–5.6] (99 studies, 198,423,289 participations) (Table 1). The prevalence fluctuated from 1.0 to 16.1% and higher in male compared to female (2.9% *vs*. 0.5%, $p < 0.001$).

By geographic region and province

The information on the prevalence of ARLD in different countries and regions is summarized in Table 1 and Figs. 2 and 3. The study encompassed 14 countries, including Portugal [14], Canada [15], Iceland [16], France [17, 18], China (see the following paragraph), USA [19–35], Denmark [36–38], South Korea [39, 40], Uganda [41], India [42, 43], UK [10, 44–47], Sweden [48], Japan [49–54], and Italy [55–57](Fig. 2 and Table 1). The global prevalence of ARLD in general population was 4.8% (95% CI: 4.1–5.6) (Fig. 2), which we got from 99 datasets. As the region with the highest alcohol consumption in the world [12], Europe had the highest prevalence (5.4%, 95% CI: 3.9–7.1). According to the analysis results in Table 1 and the color depth distribution in Fig. 2, the prevalence of ARLD was higher in most European countries. Italy had the highest prevalence rate of 16.1% (95% CI: 1.2–43.3), followed by Sweden (14.0%, 95% CI: 13.0–15.0) and the UK (7.2%, 95% CI: 3.0–13.0), while France, Denmark, Iceland and Portugal had the lowest prevalence rates: 1.4% (95% CI: 1.3–1.4), 1.2%(95% CI: 0.1–3.4), 1.0% (95% CI: 0.8–1.2) and 1.0% (95% CI: 0.9–1.1), respectively (Table 1, Fig. 2). Although alcohol consumption in Asia was less than that in Europe, the prevalence in India (11.8%, 95% CI: 10.7–12.9) and Japan (10.4%, 95% CI: 3.2–20.9) was high (Table 1). Uganda in Africa has the high prevalence of 11.0% (95% CI: 7.7–10.2). Surprisingly, the United States, with the largest number of studies (17 studies) and participants (137,929,285 persons), had the lower prevalence (5.0%, 95% CI: 2.9–7.6) (Table 1).

Since the pathogenesis of ARLD in Western countries, which has been well-documented, differed from that in China [9], the prevalence in China's provinces was analyzed separately. The prevalence of ARLD was 3.9% (95% CI: 2.9–5.1) (Table 1) in Chinese people, which was lower than the global prevalence. Data from 21 cities or provinces, including Sichuan [58–62], Beijing [63–66], Guangdong [67–71], Jiangsu [72, 73], Shanghai [74, 75], Gansu [76, 77], Shaanxi [78–80], Guizhou [81, 82], Zhejiang [83–89], Henan [90, 91], Hunan [92, 93], Jilin [94–97], Heilongjiang [98], Taiwan [99], Tibet [100], Liaoning [101], Yunnan [102, 103], Anhui [104, 105], Shandong [106, 107], Hebei [108], and Xinjiang [109] provinces, were collected (Fig. 3 and Table 1). The prevalence in Xinjiang was 10.7% (95% CI: 9.5–11.9), which was much higher than the overall prevalence in China. It was the province with the highest prevalence, followed by Hebei (9.8%, 95% CI: 7.9–12.0) and Shandong provinces (8.1%, 95% CI 7.5–8.7), which were famous for strong drinking. Surprisingly, Shaanxi and Gansu provinces, famous for binge drinking, had the lower prevalence. Further analysis of Northeast China [95–98, 101] (including Heilong, Jilin, and Liaoning provinces) and Northwest China [76–80, 109–111] (including Xinjiang, Shaanxi, and Gansu provinces) showed that the prevalence was 4.8% (95% CI: 3.7–6.0) and 5.9% (95% CI: 4.2–7.9), which were much higher than the national prevalence. The prevalence rates were relatively low in Sichuan (1.8%, 95% CI: 1.1–2.6), Beijing (1.9%, 95% CI: 0.1–5.5), Guangdong (1.9%, 95% CI: 0.7–3.6), Jiangsu (2.2%, 95% CI: 1.9–2.5), and Shanghai (2.9%, 95% CI: 2.5–3.3), all which were relatively economically developed regions (Table 1).

By sex

Herein, 58 studies [14–16, 18–20, 22–25, 29–31, 33–40, 44–46, 50, 53, 55, 56, 58–60, 63–67, 71, 77, 78, 80, 81, 84–86, 92, 93, 96, 97, 99–101, 104–107, 111] were included to analyze the influence of sex on the prevalence of ARLD. The prevalence of male was 2.9% (95% CI: 2.4–3.5), which was much higher than that of women (0.5%, 95% CI: 0.4–0.7) (Table 1).

By study period

In order to further analyze the changes in the global ARLD prevalence in different periods, seventy three articles indicating the study years were included. From these, 48 articles [10, 20, 25, 26, 30, 34, 35, 37, 40, 42–44, 48, 50,

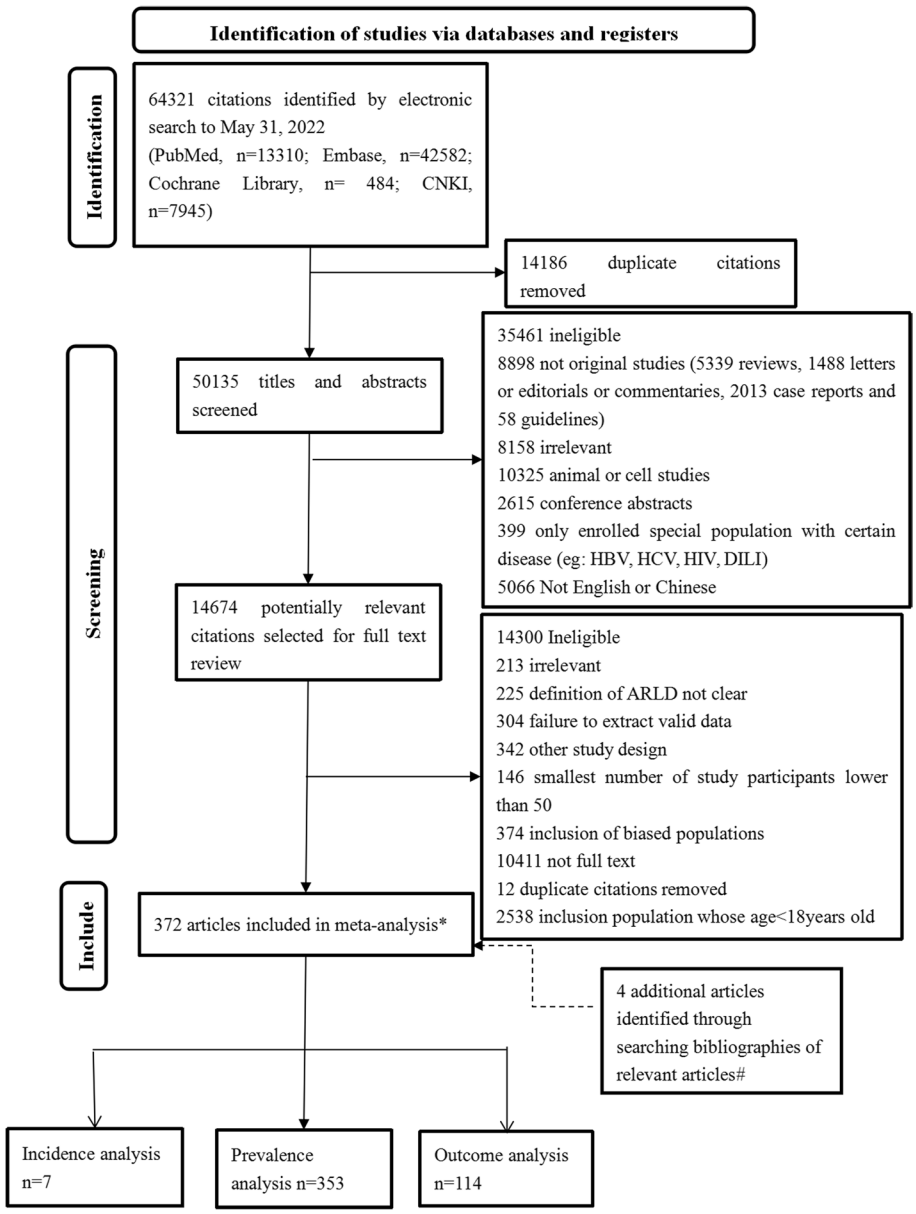

Fig. 1 Study selection. The entire screening process were described, including the selected the reasons for the exclusion of articles and the number of including and excluding artcles. ARLD: alcohol-associated liver disease. HBV: hepatitis B virus. HCV: hepatitis C virus. HIV: human immunodeficiency virus. DILI: drug-induced liver injury.* Some articles were used for more than one of the analyses of prevalence, incidence, and outcomes. # When searching for relevant articles found 4 additional articles that met the inclusion criteria

53, 59–63, 67–69, 71–74, 76, 80, 81, 83, 85, 87–91, 93–97, 99–102, 109, 111] were used for subgroup analysis of the prevalence from 2000 to 2010: 4.6% (95% CI: 4.2–5.1) (Table 1). A total of 18 articles [10, 17, 19, 22, 26, 41, 43, 49, 51, 52, 65, 70, 75, 78, 79, 82, 104, 106] were used to analyze the prevalence in 2011–2021, and the result was 5.6% (95% CI: 2.4–10.1), which was significantly higher in this period than in 2000–2010 (Table 1).

The characteristic of ARLD

The characteristics of ARLD patients in nationality, race, disease severity, complication, drinking years, smoking/smoked, and hepatitis virus infection are different. This

Table 1 The prevalence of ARLD

	Studies (N)	Participations (N)	ARLD (n)	Prevalence (%, 95%CI)	I^{2**}	*P*
By country area						
Overall	99	198,423,289	1,806,506	4.8% (4.1–5.6)	99.998	< 0.001
Portugal	1	773,187	7751	1.0% (0.9–1.1)	-	< 0.001
Canada	1	690,401	7112	1.0% (1.0–1.1)	-	< 0.001
Iceland	1	16,000	317	1.0% (0.8–1.2)	-	< 0.001
Denmark	3	5,531,764	11,260	1.2% (0.1–3.4)	99.990	0.046
France	2	261,248	3663	1.4% (1.3–1.4)	-	< 0.001
South Korea	4	48,933,410	41,262	2.3% (0.1–7.7)	99.934	< 0.001
China	54	2,976,478	29,681	3.9% (2.9–5.1)	99.902	< 0.001
USA	17	137,929,285	1,664,682	5.0% (2.9–7.6)	100	< 0.001
UK	5	1,187,539	23,457	7.2% (3.0–13.0)	99.989	< 0.001
Japan	6	88,043	12,318	10.4% (3.2–20.9)	99.931	< 0.001
Uganda	1	8099	888	11.0% (7.7–10.2)		< 0.001
India	2	3229	422	11.8% (10.7–12.9)	-	< 0.001
Sweden	1	4611	645	14.0% (13.0–15.0)	-	< 0.001
Italy	3	19,995	3206	16.1% (1.2–43.3)	-	0.009
By regions						
Asia	66	52,001,160	83,683	4.5% (4.0–5.5)	99.950	< 0.001
North America	17	138,619,686	1,671,794	4.7% (2.7–7.1)	100	< 0.001
Europe	16	7,794,344	50,141	5.4% (3.9–7.1)	99.980	< 0.001
Province of China[a]						
Overall	54	2,976,478	29,681	3.9% (2.9–5.1)	99.903	< 0.001
Sichuan	5	27,775	652	1.8% (1.1–2.6)	94.661	< 0.001
Beijing	4	2,660,342	16,051	1.9% (0.1–5.5)	99.989	0.007
Guangdong	5	27,835	878	1.9% (0.7–3.6)	98.563	0.001
Jiangsu	2	8453	190	2.2% (1.9–2.5)	-	< 0.001
Shanghai	2	6192	192	2.9% (2.5–3.3)	-	< 0.001
Gansu	2	50,342	1627	3.2% (3.1–3.4)	-	< 0.001
Shaanxi	3	16,572	652	3.5% (1.7–6.0)	-	< 0.001
Guizhou	2	20,229	776	3.8% (3.6–4.1)	-	< 0.001
Zhejiang	7	37,375	1904	4.2% (1.8–7.5)	99.410	< 0.001
Henan	2	5648	241	4.2% (3.7–4.7)	-	< 0.001
Hunan	2	19,696	836	4.2% (3.9–4.5)	-	< 0.001
Jilin	4	14,462	756	4.7% (3.1–6.7)	95.180	< 0.001
Heilongjiang	1	1203	58	4.8% (3.7–6.2)	-	< 0.001
Taiwan	1	46,565	2249	4.8% (4.6–5.0)	-	< 0.001
Tibet	1	2178	106	4.9% (4.0–5.9)	-	< 0.001
Liaoning	1	7420	368	5.0% (4.5–5.5)	-	< 0.001
Yunnan	2	2190	159	6.8% (5.8–7.9)	-	< 0.001
Anhui	2	6273	581	8.0% (7.3–8.7)	-	< 0.001
Shandong	2	8495	692	8.1% (7.5–8.7)	-	< 0.001
Hebei	1	866	85	9.8% (7.9–12.0)	-	< 0.001
Xinjiang	1	2567	274	10.7% (9.5–11.9)		< 0.001
Northeast China[b]	5	22,851	1171	4.8% (3.7–6.0)	98.617	< 0.001
Northwest China[c]	8	73,281	2907	5.9% (4.2–7.9)	99.739	< 0.001
By sex	58	195,227,050	1,265,327		99.993	
Male			924,436	2.9% (2.4–3.5)		< 0.001
Female			340,891	0.5% (0.4–0.7)		< 0.001

Table 1 (continued)

	Studies (N)	Participations (N)	ARLD (n)	Prevalence (%, 95%CI)	I^{2**}	*P*
By study period	67	122,004,134	598,920			
2000–2010	49	119,422,376	509,074	4.6% (4.2–5.0)	99.987	< 0.001
2011–2021	18	2,581,758	89,846	5.6% (2.4–10.1)	99.993	< 0.001

Because some articles provide more than one characteristics of population with ARLD, they can be used for multiple subgroup analysis. Therefore, the sum of the articles and population data is not equal to the total

ARLD Alcohol related liver disease

** All *p* values for I^2 are lower than 0.05

[a] Study province referred to study province, Municipality, Autonomous Region, or Special Administrative Region

[b] Northeast China comprised data from Heilongjiang, Jilin, Liaoning

[c] Northwest China comprised data from Xinjiang, Shaanxi, Gansu

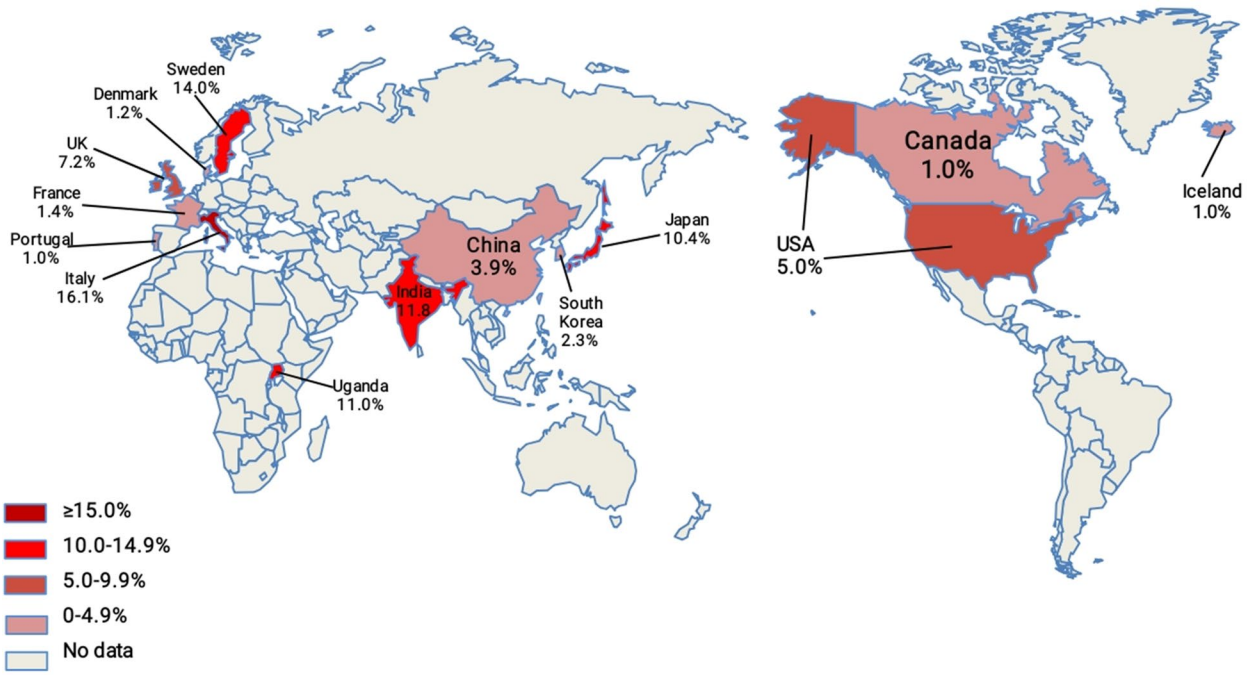

Fig. 2 The global prevalence of ARLD. The prevalence in 14 countries was indicated by depth of red. The 14 countries included Portugal, Canada, Iceland, France, China, USA, Denmark, South Korea, Uganda, India, UK, Sweden, Japan, and Italy

part was described by comparing the percentage of each part of ARLD population.

By race and nationality

For race, categories included Caucasians, Africans, Hispanic and Asians, and these are the relatively lager amount of data that we can gather from the studies. According to the 46 articles [20–26, 29–31, 33, 35, 112–145] collected, the proportion of Caucasians was the highest (68.9%, 95% CI: 67.6–70.2) in ARLD, which was much higher than Africans (8.9%, 95% CI: 8.5–9.4) and Hispanic (8.6%, 95% CI: 7.9–9.4) (Table 2). The Asians was the lowest (0.3%, 95 CI: 0.1–0.6), with wide variation between races.

China has multiple ethnic groups. The data [103, 146–154] collected in this study divided Chinese people with ARLD into Han nationality and other minorities, which including Mongol, Chosen, Li, Hmong, Kazak, Uyghurs, Xibe, Hani, Yi and Dai (Table 2). The minority group accounted for 61.6% (95% CI: 52.8–70.0), which was much higher than in the Han group (38.4%, 95% CI: 30.0–47.2).

By duration of alcohol intake and the daily dose of pure alcohol consumption

Alcohol as a pathogenic factor, drinking years and average daily drinking consumption affected the natural course of ARLD. According to the data of ARLD

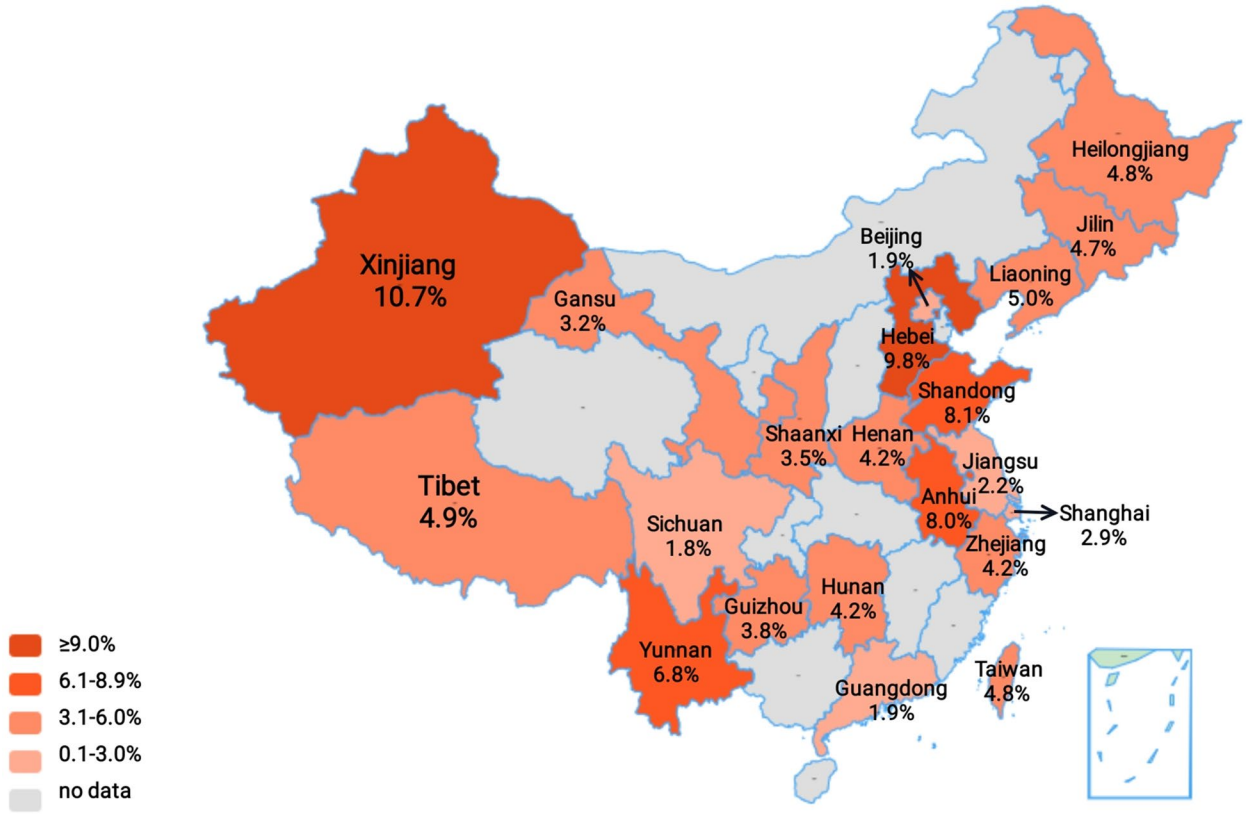

Fig. 3 The prevalence of ARLD in China by provinces. The prevalence in 21 provinces of China was indicated by depth of red. The prevalence in China was obtained from the analysis of 21 cities or provinces including Sichuan, Beijing, Guangdong, Jiangsu, Shanghai, Gansu, Shaanxi, Guizhou, Zhejiang, Henan, Hunan, Jilin, Heilongjiang, Taiwan, Tibet, Liaoning, Yunnan, Anhui, Shandong, Hebei, and Xinjiang provinces

population, they were divided into three subgroups with drinking years of 5–9, 10–19, > 20. The ARLD with drinking duration > 20 years accounted for 54.8% (95% CI: 46.9–62.6) (Table 2). The analysis of the 19 studies [78, 80, 81, 84, 92, 95, 146, 148, 149, 151, 155–163] describing the correlation between drinking years and ARLD revealed that the longer the drinking years, the more patients with ARLD. The average daily alcohol consumption of 4184 ARLD patients [98, 133, 140, 153, 164–179] included in the study was up to 146.6 g/d (95% CI: 123.8–169.4) (Table 2), which was much higher than the excessive drinking defined by the National Institute on Alcohol Abuse and Alcoholism (NIAAA): > 4 cups/day for men and > 3 cups/day for women (1 standard cup = 14 g alcohol) [180].

By smoking and hepatitis viral infectious

As a risk factor of many diseases, tobacco has been proven to increase the risk of liver fibrosis [181]. Among 27 articles [19, 23, 24, 33, 37, 40, 49, 163, 171–173, 179, 182–196], 106,599 people were diagnosed with ARLD, of which 53,661 were former or current smokers, accounting for 59.5% (95% CI: 55.9–63.1) (Table 2). Three articles [37, 186, 188] described that smoking promoted disease progression, and two studies [23, 33] showed that smoking increased the mortality and hospitalization rates. In addition to advising the patients to quit alcohol, education on smoking cessation was also conducive to improving the progress of ARLD.

Hepatitis virus infection and alcohol are the major causes of chronic liver disease. Among the 67 articles [19, 21, 25, 26, 30, 40, 53, 87, 99, 114, 115, 120, 121, 123, 125, 126, 156, 158, 161, 167, 168, 171, 172, 176, 192, 194, 196–236] included, 92,548/1473951 patients with ARLD were complicated with a hepatitis viral infection, with the prevalence of 18.7% (95% CI: 16.0–21.5), and the infection rate of HCV (5.6%, 95% CI: 4.1–7.4) was higher than that of HBV (3.6%, 95% CI: 3.0–4.3) (Table 2). Three of the 67 articles [210, 235, 236] described that the liver damage caused by concurrent hepatitis virus infection and alcohol was severe. One article [194] suggested that the presence of both causes an increased possibility of 30-day readmission. The data of 4 studies [30, 126, 201, 204] showed that the mortality of ARLD with virus

Table 2 The influence of various influencing factors on the prevalence of ARLD

	Studies (N)	ARLD (n)	Characteristic (%, 95%CI)	I^{2**}	*P*
Race	46	4,828,061			
Caucasians		3,146,877	68.9% (67.6–70.2)	99.838	< 0.001
Africans		484,170	8.9% (8.5–9.4)	99.243	< 0.001
Hispanic		814,203	8.6% (7.9–9.4)	99.830	< 0.001
Asians		23,931	0.3% (0.1–0.6)	99.905	< 0.001
Nationality	10	2078			
Minorities[a]		1299	61.6% (52.8–70.0)	93.630	< 0.001
Han		779	38.4% (30.0–47.2)	93.630	< 0.001
Severity of disease	147	564,855			
Mild Alcoholic liver disease		9730	2.1% (1.3–3.0)	99.675	< 0.001
Alcoholic fatty liver disease		12,566	19.1% (17.0–21.4)	99.695	< 0.001
Alcoholic hepatitis		35,819	16.4% (13.4–19.6)	99.870	< 0.001
Alcoholic cirrhosis		348,848	32.9% (27.3–38.7)	99.939	< 0.001
Other		157,892	6.0% (3.0–9.8)	99.955	< 0.001
By complication	119	3,527,134			
SBP		97,135	0.2% (0–0.5)	99.918	0.020
Hepatorenal syndrome		193,512	0.7% (0.4–1.1)	99.820	< 0.001
Infection		119,448	2.4% (1.6–3.3)	99.935	< 0.001
Gastrointestinal haemorrhage		575,413	7.5% (6.0–9.2)	99.951	< 0.001
Encephalopathy		1,006,363	10.6% (8.8–12.6)	99.954	< 0.001
Ascites		1,465,780	25.1% (20.5–30.0)	99.986	< 0.001
Duration of alcohol intake(yr)	19	4576			< 0.001
5–9(yr)		449	13.0% (9.1–17.5)	94.043	< 0.001
10–19(yr)		1187	29.5% (24.9–34.3)	90.974	< 0.001
≥ 20(yr)		2940	54.8% (46.9–62.6)	96.366	< 0.001
Daily dose of pure alcohol consumed (g/d)	20	4184	146.6 (123.8,169.4)	100	< 0.001
Smoking	27	106,599	59.5% (55.9–63.1)	98.779	< 0.001
By viral infection	67	1,473,951			< 0.001
HBV		11,712	3.6% (3.0–4.3)	99.637	< 0.001
HCV		66,744	5.6% (4.1–7.4)	99.932	< 0.001
HBV and/or HCV		92,548	18.7% (16.0–21.5)	99.929	< 0.001

Because some articles provide more than one characteristics of population with ARLD, they can be used for multiple subgroup analysis. Therefore, the sum of the articles and population data is not equal to the total

ARLD Alcohol related liver disease, *SBP* Spontaneous bacterial peritonitis

** All *p* values for I^2 are lower than 0.05

[a] The minorities group included Mongol, Chosen, Li, Hmong, Kazak, Uyghurs, Xibe, Hani, Yi and Dai

infection was higher than that of ARLD only. Therefore, antiviral drugs are essential for ARLD with hepatitis viral infection while abstaining from alcohol.

By the stage of disease and complications

ARLD caused by long-term heavy drinking included the whole disease spectrum from liver steatosis to liver cirrhosis and even liver cancer [237]. The constituent ratio of alcoholic cirrhosis in ARLD population was the highest, up to 32.9% (95% CI: 27.3–38.7) (Table 2) got from 147 articles [16, 19, 25–27, 31, 36, 46, 64, 66, 80, 81, 84, 86, 91, 92, 98, 100–102, 111, 113, 117, 119, 121–124, 145, 148, 149, 152, 153, 157, 159–162, 165, 170, 173–176, 187, 193, 194, 197, 199, 208, 219, 221–223, 225, 227, 229–234, 236, 238–321]. A total of 119 datasets [25, 26, 30, 43, 47, 113, 115, 116, 122, 125, 126, 128, 129, 131, 132, 136, 137, 142, 153, 156, 157, 161, 162, 168, 171–173, 176, 178, 186, 190, 193–197, 204, 207, 208, 213, 215, 221, 225–230, 241–243, 245, 250–252, 255, 262, 267, 272, 275, 276, 294, 297, 299, 306, 311, 318, 321–372] were used to analyze the prevalence of ascites, gastrointestinal bleeding, hepatic encephalopathy, spontaneous peritonitis (SBP), hepatorenal syndrome, and bacterial infection in ARLD. Ascites were the most common complication, with a

prevalence of 25.1% (95% CI: 20.5–30.0), three times that of gastrointestinal bleeding (Table 2).

SBP is the most common and life-threatening bacterial infection in cirrhotic patients with ascites. The prevalence of SBP in ARLD population was not high (0.2%, 95% CI: 0–0.5) (Table 2). However, the prevalence of SBP in alcoholic cirrhosis [25, 122, 132, 194, 204, 208, 356, 362, 368, 373] with ascites was 12.5% (95% CI: 10.7–14.4). Since the clinical symptoms of SBP were often occult and only limited research data were available, the prevalence may be underestimated. The occurrence of the above complications often indicated decompensated alcoholic cirrhosis, which was the predictor of mortality. Diabetes is also one of the critical factors affecting prognosis. A total of 40 studies [26, 33, 77, 131, 145, 156, 159, 171, 172, 176, 178, 183, 207, 215, 220, 221, 223, 226, 228, 260, 270, 294, 295, 297, 306, 307, 348, 360, 368, 372, 374–383] showed that 15.6% (95% CI: 12.8–18.7) ARLD were complicated by diabetes.

Incidence of ARLD

To estimate the incidence of ARLD, data from 7 eligible cohort studies [16, 39, 47, 384–387] were selected, with a cumulative follow-up of 368,565,116.7 person-years. The number of newly defined ARLD cases was 62,819, and the incidence was 0.208 (95% CI: 0.125–0.305) per 1000 person-years (Table 3). The incidence in males was about four times as high as that in females (0.163 *vs*. 0.035 per 1000 person-years, $p < 0.05$) (Table 3), suggesting a significant gender difference in the incidence.

Mortality and cause of ARLD death

A total of 114 datasets [17, 23, 25, 26, 30, 33, 36, 39, 43, 46, 64, 115, 126, 128, 130, 136, 140, 142, 156, 162, 168, 169, 173, 176, 186, 189, 190, 192, 196, 197, 204, 208, 213, 216, 220, 223, 225, 228, 231, 236, 242–245, 249, 258, 265, 267, 273, 276, 280, 283, 294, 307, 309, 311, 320–322, 324–329, 332–336, 338–345, 347, 348, 353, 355, 356, 359, 364, 366–375, 380, 382, 385, 386, 388–402] were used to analyze the mortality, including 786,199 ARLD patients, while 183,929 people died during the study (Table 4). The mortality was 23.9% (95% CI: 18.9–29.2). Since not all studies provided the analysis of the causes of death, 22 articles [33, 46, 47, 162, 168, 189, 243, 245, 249, 265, 273, 326, 338, 340, 344, 345, 356, 364, 378, 390, 396, 401] were selected for subsequent analysis, with the mortality of 37.1% (95% CI: 27.7–47.1). According to the funnel plot and Egger's test, $p = 0.612$ indicated that the funnel plot was symmetrical, i.e., no publication bias in the 22 datasets. A total of 15,965 individuals suffered from ARLD, of which 4746 died of liver disease and related complications. The mortality related to liver diseases was 21.6% (95% CI: 15.8–28.1), about twice that of non-liver diseases (10.4%, 95%CI: 6.3–15.3) (Table 4).

Discussion

ARLD is a common chronic liver disease caused by long-term heavy drinking. Alcoholic fatty liver could develop into alcoholic hepatitis characterized by inflammation, which further progresses to alcoholic liver fibrosis, alcoholic cirrhosis, and even cancer in some cases. The whole process is affected by the interaction of many risk factors involved in this article, such as sex, race, hepatitis virus

Table 3 The incidence of ARLD in general population

	Studies (N)	General population at baseline (N)	ARLD patients (n)	Total follow-up (person- years)	Incidence (per 1000 person-years, 95%CI)	I^2 ** (%)	*p*
Incidence	7	60,619,863	62,819	368,565,116.7	0.208 (0.125–0.305)	100	< 0.001
Male			52,048		0.163 (0.095–0.244)	100	< 0.001
Female			10,771		0.035 (0.015–0.062)	99.99	< 0.001

ARLD Alcohol related liver disease

** All *p* values for I^2 are lower than 0.05

Table 4 The outcomes of ARLD

	Studies (N)	Death (n)	Mortality (%, 95%CI)	I^2** (%)	*P*
Mortality	114	183,929	23.9% (18.9–29.2)	99.959	< 0.001
The result of death	22	8032			< 0.001
Liver-related		4746	21.6% (15.8–28.1)	98.631	< 0.001
Non-liver-related		3053	10.4% (6.3–15.3)	98.602	< 0.001

** All *p* values for I^2 are lower than 0.05

infection and smoking. Genetic and other potential etiology of liver diseases which identified in this article could also affect the natural course of the disease. The co-existence of multiple risk factors could largely promote the progression of ARLD through complex molecular mechanisms. Several studies have shown that alcohol abuse is accompanied by metabolic syndrome [252, 403] or hepatitis virus infection [404, 405], would accelerate the speed of liver fibrosis. Another study demonstrated that 70% of HCV-infected patients in Europe and North America are heavy drinkers [406], which is in agreement with the high prevalence shown in the present study.

According to the *2018 National Survey on Drug Use and Health*, 14.4 million adults ≥ 18-years-old suffered from alcohol use disorders in the United States, including 9.2 million men and 5.3 million women [407]. Since 2000, men have been drinking about three times as much as women, according to the latest WHO data [408]. The current data also showed that the prevalence of ARLD in male was 2.9% which was nearly six times that in female, which could be related to the socioeconomic status and alcohol consumption level of men and women. Although the prevalence of different sexes varied greatly, women's susceptibility to alcohol cannot be ignored. According to the WHO statistics, the global alcohol consumption is increasing [1], with the average level of alcohol consumption in 2005 was 5.5 L of pure alcohol per capita, and in 2016 was 6.1L [1, 408]. The current findings showed that the prevalence during 2011–2021 was higher than that during 2000–2010, which was consistent with the epidemiological characteristics of alcohol.

Significant differences in alcohol consumption patterns, metabolism, genetics, and socio-economic factors among different subgroups affected the prevalence of ARLD. A direct correlation was established between alcohol and liver disease. The longer the drinking years and/or the higher the average daily drinking amount, the higher the risk of ARLD. Therefore, the distribution of high prevalence rates was consistent with regions where drinking culture was in vogue. Although Europe is still the region with the highest prevalence in the world, Portugal and France are the lowest which have a long history of wine. Thus, it could be deduced that the type of alcohol may also have an impact on the prevalence. Askgaard et al. demonstrated that red wine had a lower risk than other types of alcoholic beverages when drinking the same amount of alcohol [384]. In Uganda, the prevalence of homemade alcoholic beverages is high [409]. Similar issues may be seen in some provinces in China, such as Xinjiang, Hunan and Henan provinces [410]. This phenomenon may be also related to the cultural customs of different ethnic groups. Many minorities had the tradition of homemade alcoholic beverages. For example, Duihua wine, the special homemade wine unique to the Dai nationality, has a high alcohol content of over 60%. Its health risk may also be attributed to its toxic impurities, such as heavy metals and acetaldehyde [411]. The prevalence in USA which is lower than our expectations may be attributed to the government restriction on alcohol consumption. The United States established NIAAA in 1971 [412], and has a stable government funding program. For example, the raised alcohol taxes and the restriction of the time and place of alcohol sales have significantly reduced the incidence of ARLD. The comparison of prevalence in different countries reflected the advantages, which could be used as a reference for countries with a high prevalence. With the improvement of the economic level of developing countries, the prevalence in Asia is raising, which should be paid more attention. Base on the WHO data, the total per capita alcohol consumption in India increased from 2.4L in 2005 to 5.7L in 2016, while the per capita alcohol consumption in China increased from 4.1L in 2005 to 7.2L in 2016 [1]. Although the alcohol consumption in India was lower than that in China, the prevalence in India was significantly higher than that in China, which was related to socio-economic factors.

Smoking is an independent risk factor for liver fibrosis that could accelerate the natural course of ARLD [181]. Whether a dose-related correlation was established between tobacco and the disease and whether the progression of ARLD was related to smoking years needs to be confirmed further by a large number of studies. Based on the current results, > 50% of ARLD had former or current smoking. The harmful effect of smoking on liver-related diseases should be under intensive focus. Hepatitis virus infection and alcohol are the main pathogenic factors of chronic liver injury; their co-existence could aggravate liver damage through virus replication and immune suppression [406, 413]. Therefore, treating the co-existent viral hepatitis with antiviral drugs is imperative.

Some studies proposed that moderate drinking was beneficial to health [414–416], but the defined alcohol intake and types of alcohol have not reached a consensus. American Association for the Study of Liver Diseases has set a safe threshold of alcohol consumption for men (no more than 2standard drinks per 24 h) and women (no more than 1standard drinks per 24 h) [417]. Meanwhile, the research results have shown that the longer the drinking years, the more patients suffer from ARLD. Early abstinence from alcohol is crucial to reducing the risk of ARLD.

While analyzing the influence of race on ARLD, we found that the proportion varies greatly among different subgroups, especially Caucasians and Asians. Notably,

the percentage of the minority group with ARLD was much higher than the Han group. This phenomenon could be attributed to the difference in the constitution and the cultural customs; whether we could improve the early detection rate by setting different safety thresholds for different ethnicities needs to be investigated further.

The advantages of this study were to provide as complete as possible the epidemiological characteristics of ARLD. Presently, the epidemiological investigations of ARLD are mainly regional studies. This study provided the necessary data for countries to study ARLD and provided the trend of the disease to help the government in formulating alcohol management policies and conducting public education. Nevertheless, the present study had some limitations: the high heterogeneity between each study, which is common in such meta-analysis; only 1 or 2 datasets were included in subgroups resulting in the limitations of the results.

The eight studies to calculate the incidence are mainly concentrated in Europe, where the alcoholic population is concentrated, so the results are relatively high. Large cohort study, which cost a lot of manpower and material resources, is very important to explore the global incidence. Based on the premise of large population base and long follow-up time, the results of this review can reflect the global incidence to a certain extent. The phenomenon—mortality deduced from the 22 datasets was used to analyze the cause of death, which was much higher than that of 114 studies used for the analysis of mortality. This phenomenon could be attributed to the following reasons: the populations in the articles providing the cause of death were serious; the sample size was small; the study population was concentrated in European countries. Therefore, 23.9% was similar to the level of global mortality.

Taken together, these results showed that ARLD is one of the most common chronic liver diseases in the world, with a prevalence of 4.8%. With an improved economy, the per capita alcohol consumption is increasing rapidly, and the increasing risk of ARLD in developing countries is gaining much attraction. In addition to strengthening the management of abstinence from alcohol, we should investigate the metabolism, histology, and clinical characteristics of ARLD. Also, we should get rid of the dependence on asking the patients about their drinking history for diagnosis. Thus, non-invasive examinations and specific biomarkers are essential for early recognition. In addition to banning alcohol intake, developing safe and effective intervention measures, such as using the gut-liver axis with probiotics and prebiotics to improve the gut microbiota. Nonetheless, there are still many issues with respect to the prevention, development, and prognosis of ARLD that need to be investigated to improve the epidemiology of ARLD.

Conclusions

Overall, the global prevalence of ARLD is 4.8%, and the prevalence varies greatly among different regions, which may be influenced by various factors such as gender, race/ethnicity, drinking years, comorbidities and so on. With the improvement of economic level, the prevalence of ARLD is on the rise. By increasing alcoholic taxes and controlling the quantity and timing of alcohol sales, the harm caused by alcohol can be reduced to some extent. Large—scale cross-sectional and cohort studies are helpful to understand the epidemiological characteristics of ARLD.

Abbreviations

ARLD	Alcohol related liver disease
CNKI	China National Knowledge Infrastructure
NIAAA	National Institute on Alcohol Abuse and Alcoholism
SBP	Spontaneous peritonitis

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12889-023-15749-x.

Additional file 1: Supplementary methods. Supplementary Table 1. Search strategy. **Supplementary Table 2.** Characteristics of included studies for analysis of overall ARLD prevalence. **Supplementary Table 3.** Summary of articles used to analyze the characteristics of ARLD. **Supplementary Table 4.** Characteristics of included studies for analysis of overall ARLD incidence. **Supplementary Table 5.** Characteristics of included studies for analysis of overall ARLD Mortality. **Supplementary Figure 1.** The forest plots of global prevalence. **Supplementary Figure 2.** The forest plots of China prevalence. **Supplementary Figure 3.** The forest plots of men prevalence. **Supplementary Figure 4.** The forest plots of female prevalence. **Supplementary Figure 5.** Funnel plot of studies included for analysis of overall ARLD prevalence.

Acknowledgements

Not applicable.

Authors' contributions

XHC designed the study, conducted and oversaw data extraction, statistical analysis, data interpretation, article preparation, article review, and correspondence. NXX, ZL contributed to the design and data interpretation, article preparation, and article review. XYF, ZMH, HYX, ML, LY contributed to the data checking, data analysis, article review, article preparation, and article review. All authors contributed to the final article and approved the final version.

Funding

This study was supported by National Key R&D Program of China (2021YFC2301801); Capital's Funds for Health Improvement and Research of China (CFH 2020–2171); The Digestive Medical Coordinated Development Center of Beijing Hospitals Authority under Grant No.XXT26.

Availability of data and materials

The data that support the findings of this study are available from the corresponding author.

Declarations

Ethics approval and consent to participate
Not applicable.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

Received: 15 February 2023 Accepted: 25 April 2023
Published online: 11 May 2023

References

1. Global status report on alcohol and health 2018 [https://www.who.int/substance_abuse/publications/global_alcohol_report].
2. Ding C, O'Neill D, Bell S, Stamatakis E, Britton A. Association of alcohol consumption with morbidity and mortality in patients with cardiovascular disease: original data and meta-analysis of 48,423 men and women. BMC Med. 2021;19(1):167.
3. Buckley C, Ye Y, Kerr WC, Mulia N, Puka K, Rehm J, Probst C. Trends in mortality from alcohol, opioid, and combined alcohol and opioid poisonings by sex, educational attainment, and race and ethnicity for the United States 2000–2019. BMC Med. 2022;20(1):405.
4. Xiao J, Wang F, Wong NK, He J, Zhang R, Sun R, Xu Y, Liu Y, Li W, Koike K, et al. Global liver disease burdens and research trends: analysis from a Chinese perspective. J Hepatol. 2019;71(1):212–21.
5. Disease GBD, Injury I, Prevalence C. Global, regional, and national incidence, prevalence, and years lived with disability for 310 diseases and injuries, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015. Lancet. 2016;388(10053):1545–602.
6. Mellinger JL, Shedden K, Winder GS, Tapper E, Adams M, Fontana RJ, Volk ML, Blow FC, Lok ASF. The high burden of alcoholic cirrhosis in privately insured persons in the United States. Hepatology (Baltimore, MD). 2018;68(3):872–82.
7. Bang HA, Kwon YH, Lee MJ, Lee WC. Trends in the epidemiological aspects and mortality of alcoholic liver disease in Korea in the decade between 2000 and 2009. J Clin Med Res. 2015;7(2):91–6.
8. Rehm J, Samokhvalov AV, Shield KD. Global burden of alcoholic liver diseases. J Hepatol. 2013;59(1):160–8.
9. Im PK, Millwood IY, Kartsonaki C, Guo Y, Chen Y, Turnbull I, Yu C, Du H, Pei P, Lv J, et al. Alcohol drinking and risks of liver cancer and non-neoplastic chronic liver diseases in China: a 10-year prospective study of 0.5 million adults. BMC Med. 2021;19(1):216.
10. Green MA, Strong M, Conway L, Maheswaran R. Trends in alcohol-related admissions to hospital by age, sex and socioeconomic deprivation in England, 2002/03 to 2013/14. BMC Public Health. 2017;17(1):412.
11. Singal AK, Bataller R, Ahn J, Kamath PS, Shah VH. ACG Clinical Guideline: Alcoholic Liver Disease. Am J Gastroenterol. 2018;113(2):175–94.
12. Seitz HK, Bataller R, Cortez-Pinto H, Gao B, Gual A, Lackner C, Mathurin P, Mueller S, Szabo G, Tsukamoto H. Alcoholic liver disease. Nat Rev Dis Primers. 2018;4(1):16.
13. Association NWoFLaALDCSoHCM, Association FLECCMD. Guidelines of prevention and treatment for alcoholic liver disease:a 2018 update. 2018.
14. Cortez-Pinto H, Marques-Vidal P, Monteiro E. Liver disease-related admissions in Portugal: clinical and demographic pattern. Eur J Gastroenterol Hepatol. 2004;16(9):873–7.
15. Slaunwhite AK, Macdonald S. Primary health care utilization for alcohol-attributed diseases in British Columbia Canada 2001–2011. BMC Fam Pract. 2015;16(1):34.
16. Hauksson K, Arnardottir M, Agustsson AS, Magnusdottir BA, Baldursdottir MB, Lund SH, Kalaitzakis E, Bjornsson ES. Increase in the incidence of alcoholic pancreatitis and alcoholic liver disease in Iceland: impact of per capita alcohol consumption. Scand J Gastroenterol. 2020;55(5):615–20.
17. Mallet V, Beeker N, Bouam S, Sogni P, Pol S. Demosthenes research g: Prognosis of French COVID-19 patients with chronic liver disease: a national retrospective cohort study for 2020. J Hepatol. 2021;75(4):848–55.
18. Duchmann JC, Joly JP, Decrombecque C, Delcenserie R, Levy S, Capron D, Capron JP. Cirrhosis: a new, but expected cause of biliary sludge. Alcohol Clin Exp Res. 1997;21(1):119–21.
19. Adejumo AC, Ajayi TO, Adegbala OM, Adejumo KL, Alliu S, Akinjero AM, Onyeakusi NE, Ojelabi O, Bukong TN. Cannabis use is associated with reduced prevalence of progressive stages of alcoholic liver disease. Liver Int. 2018;38(8):1475–86.
20. Cuthbert JA, Arslanlar S, Yepuri J, Montrose M, Ahn CW, Shah JP. Predicting short-term mortality and long-term survival for hospitalized US patients with alcoholic hepatitis. Dig Dis Sci. 2014;59(7):1594–602.
21. Dang K, Hirode G, Singal AK, Sundaram V, Wong RJ. Alcoholic Liver Disease Epidemiology in the United States: A Retrospective Analysis of 3 US Databases. Am J Gastroenterol. 2020;115(1):96–104.
22. Gonzalez HC, Zhou Y, Nimri FM, Rupp LB, Trudeau S, Gordon SC. Alcohol-related hepatitis admissions increased 50% in the first months of the COVID-19 pandemic in the USA. Liver Int. 2022;42(4):762–4.
23. Klatsky AL, Armstrong MA. Alcohol, smoking, coffee, and cirrhosis. Am J Epidemiol. 1992;136(10):1248–57.
24. Klatsky AL, Morton C, Udaltsova N, Friedman GD. Coffee, cirrhosis, and transaminase enzymes. Arch Intern Med. 2006;166(11):1190–5.
25. Liangpunsakul S. Clinical characteristics and mortality of hospitalized alcoholic hepatitis patients in the United States. J Clin Gastroenterol. 2011;45(8):714–9.
26. Nguyen TA, DeShazo JP, Thacker LR, Puri P, Sanyal AJ. The Worsening Profile of Alcoholic Hepatitis in the United States. Alcohol Clin Exp Res. 2016;40(6):1295–303.
27. Piette JD, Barnett PG, Moos RH. First-time admissions with alcohol-related medical problems: a 10-year follow-up of a national sample of alcoholic patients. J Stud Alcohol. 1998;59(1):89–96.
28. Singal AK, Arora S, Wong RJ, Satapathy SK, Shah VH, Kuo YF, Kamath PS. Increasing burden of acute-on-chronic liver failure among alcohol-associated liver disease in the young population in the United States. Am J Gastroenterol. 2020;115(1):88–95.
29. Singal AK, Arsalan A, Dunn W, Arab JP, Wong RJ, Kuo YF, Kamath PS, Shah VH. Alcohol-associated liver disease in the United States is associated with severe forms of disease among young, females and Hispanics. Aliment Pharmacol Ther. 2021;54(4):451–61.
30. Singal AK, Kuo YF, Anand BS. Hepatitis C virus infection in alcoholic hepatitis: prevalence patterns and impact on in-hospital mortality. Eur J Gastroenterol Hepatol. 2012;24(10):1178–84.
31. Tao N, Sussman S, Nieto J, Tsukamoto H, Yuan JM. Demographic characteristics of hospitalized patients with alcoholic liver disease and pancreatitis in los angeles county. Alcohol Clin Exp Res. 2003;27(11):1798–804.
32 Tapper EB, Halbert B, Mellinger J. Rates of and reasons for hospital readmissions in patients with cirrhosis: a multistate population-based cohort study. Clin Gastroenterol Hepatol. 2016;14(8):1181-1188 e1182.
33. Trimble G, Zheng L, Mishra A, Kalwaney S, Mir HM, Younossi ZM. Mortality associated with alcohol-related liver disease. Aliment Pharmacol Ther. 2013;38(6):596–602.
34. Wong T, Dang K, Ladhani S, Singal AK, Wong RJ. Prevalence of alcoholic fatty liver disease among adults in the United States, 2001–2016. JAMA. 2019;321(17):1723–5.
35. Jinjuvadia R, Liangpunsakul S. Trends in alcoholic hepatitis-related hospitalizations, financial burden, and mortality in the United States. J Clin Gastroenterol. 2015;49(6):506–11.
36. Becker U, Deis A, Sorensen TI, Gronbaek M, Borch-Johnsen K, Muller CF, Schnohr P, Jensen G. Prediction of risk of liver disease by alcohol intake, sex, and age: a prospective population study. Hepatology (Baltimore, MD). 1996;23(5):1025–9.
37. Dam MK, Flensborg-Madsen T, Eliasen M, Becker U, Tolstrup JS. Smoking and risk of liver cirrhosis: a population-based cohort study. Scand J Gastroenterol. 2013;48(5):585–91.
38 Jepsen P, Lash TL, Vilstrup H. The clinical course of alcoholic cirrhosis: development of comorbid diseases. A Danish nationwide cohort study. Liver Int. 2016;36(11):1696–703.
39. Lee JY, Cho Y, Hong MH, Kim J, Lee DH, Jung YJ, Kim BG, Lee KL, Kim W. Incidence, inhospital mortality, and readmission among patients

with alcoholic hepatitis in Korea: a nationwide study. J Gastroenterol Hepatol. 2019;34(4):747–54.
40. Park SH, Kim CH, Kim DJ, Park JH, Kim TO, Yang SY, Moon YS, Kim TN, Kim HK, Park HY, et al. Prevalence of alcoholic liver disease among Korean adults: results from the fourth Korea National Health and Nutrition Examination Survey, 2009. Subst Use Misuse. 2011;46(14):1755–62.
41. O'Hara G, Mokaya J, Hau JP, Downs LO, McNaughton AL, Karabarinde A, Asiki G, Seeley J, Matthews PC, Newton R. Liver function tests and fibrosis scores in a rural population in Africa: a cross-sectional study to estimate the burden of disease and associated risk factors. BMJ Open. 2020;10(3):e032890.
42. Garg R, Aggarwal S, Singh H, Kajal KS, Garg R, Pal R. Study of the relation of clinical and demographic factors with morbidity in a tertiary care teaching hospital in India. Int J Crit Illn Inj Sci. 2013;3(1):12–7.
43. Ray G. Trends of chronic liver disease in a tertiary care referral hospital in Eastern India. Indian J Public Health. 2014;58(3):186–94.
44. Hislop WS, Heading RC. Caledonian Society of G: Impact of alcohol related disease and inpatient workload of gastroenterologists in Scotland. Scott Med J. 2004;49(2):57–60.
45. Goldacre MJ, Wotton CJ, Yeates D, Seagroatt V, Collier J. Liver cirrhosis, other liver diseases, pancreatitis and subsequent cancer: record linkage study. Eur J Gastroenterol Hepatol. 2008;20(5):384–92.
46. Roberts SE, Goldacre MJ, Yeates D. Trends in mortality after hospital admission for liver cirrhosis in an English population from 1968 to 1999. Gut. 2005;54(11):1615–21.
47. Saunders JBWJ, Davies AP, Paton A. A 20-year prospective study of cirrhosis. Br Med J (Clin Res Ed). 1981;282(6266):819.
48. Nilsson E, Anderson H, Sargenti K, Lindgren S, Prytz H. Risk and outcome of hepatocellular carcinoma in liver cirrhosis in Southern Sweden: a population-based study. Scand J Gastroenterol. 2019;54(8):1027–32.
49. Hamaguchi M, Obora A, Okamura T, Hashimoto Y, Kojima T, Fukui M. Changes in metabolic complications in patients with alcoholic fatty liver disease monitored over two decades: NAGALA study. BMJ Open Gastroenterol. 2020;7(1):1–8.
50. Horie Y, Yamagishi Y, Ebinuma H, Hibi T. Obesity, type 2 diabetes, age, and female gender: significant risk factors in the development of alcoholic liver cirrhosis. Hepatol Int. 2013;7(1):280–5.
51. Iritani S, Kawamura Y, Muraishi N, Fujiyama S, Sezaki H, Hosaka T, Akuta N, Kobayashi M, Saitoh S, Suzuki F, et al. The useful predictors of zinc deficiency for the management of chronic liver disease. J Gastroenterol. 2022;57(4):322–32.
52. Nishikawa H, Shiraki M, Hiramatsu A, Hara N, Moriya K, Hino K, Koike K. Reduced handgrip strength predicts poorer survival in chronic liver diseases: a large multicenter study in Japan. Hepatol Res. 2021;51(9):957–67.
53. Ozaki K, Matsui O, Gabata T, Kobayashi S, Koda W, Minami T. Confluent hepatic fibrosis in liver cirrhosis: possible relation with middle hepatic venous drainage. Jpn J Radiol. 2013;31(8):530–7.
54. Enomoto H, Ueno Y, Hiasa Y, Nishikawa H, Hige S, Takikawa Y, Taniai M, Ishikawa T, Yasui K, Takaki A, et al. Transition in the etiology of liver cirrhosis in Japan: a nationwide survey. J Gastroenterol. 2020;55(3):353–62.
55. Bellentani S, Saccoccio G, Costa G, Tiribelli C, Manenti F, Sodde M, Saveria Crocè L, Sasso F, Pozzato G, Cristianini G, et al. Drinking habits as cofactors of risk for alcohol induced liver damage. Dionysos Study Group Gut. 1997;41(6):845–50.
56 Capocaccia L. Nutritional status in cirrhosis. Italian Multicentre Cooperative Project on Nutrition in Liver Cirrhosis. J Hepatol. 1994;21(3):317–25.
57. Stroffolini T, Sagnelli E, Sagnelli C, Smedile A, Morisco F, Coppola N, Furlan C, Almasio PL. Geographical pattern of chronic liver diseases in Italy: results from two pooled national surveys. Eur J Intern Med. 2019;61(05):40–3.
58. Sikui H, Xian Z, Xin Y. Investigation on incidence of fatty liver disease in school faculty. Chin J School Doctor. 2011;25(09):710–1.
59. Yuping L, Youfu C, Hua Y. Three years investigation on morbidity rate of public servants with fatty liver in Sichuan province and analysis of its risk factors. J Sichuan Contin Educ Coll Med Sci. 2008;27(03):188–9+193.
60. Xingxiang Y, Xiaowei L, Min D, Juhua Z. A epidemiological survey on fatty liver and its risk factors among adult population of health exam ination in Chengdu. Sichuan Med J. 2009;30(06):811–3.
61. Zhilin Y, Xiaoling L, Ziju F, Tiangui J, Liangming Y, Yejun T, Kun M, Shaofu S, Guihua Z, Tingchao Z, et al. Epidemiological survey on prevalence and risk factors of fatty liver among employees of administrative enterprises and institutions in Guangyuan City, Sichuan Province. Chin J Gastroenterol Hepatol. 2008;17(08):658–61.
62. Juhua Z. Clinical analysis of fatty liver in healthy Sichuan University in 2007. Pract J Clin Med. 2008;05(03):95.
63. Bao XY, Xu BB, Fang K, Li Y, Hu YH, Yu GP. Changing trends of hospitalisation of liver cirrhosis in Beijing, China. BMJ Open Gastroenterol. 2015;2(1):1–6.
64. Huang A, Chang B, Sun Y, Lin H, Li B, Teng G, Zou ZS. Disease spectrum of alcoholic liver disease in Beijing 302 Hospital from 2002 to 2013: a large tertiary referral hospital experience from 7422 patients. Medicine (Baltimore). 2017;96(7):1–5.
65. Wang H, Gao P, Chen W, Yuan Q, Lv M, Bai S, Wu J. A cross-sectional study of alcohol consumption and alcoholic liver disease in Beijing: based on 74,998 community residents. BMC Public Health. 2022;22(1):723–34.
66. Bing Z, Hongling L, Linmin L, Yihui R, Hong Z, Wanshu L, Shaoli Y, Shaojie X. Clinical characteristics of 4132 patients with alcoholic liver disease. Chin J Liver Dis. 2015;23(09):680–3.
67. Shangru C, Zhijie L, Chao Z, Shuhua W, Chun Y, Guanghua L. Epidemiological survey of fatty liver and analysis of risk factors in a general adult population in Xinhui district. Mod Digestion Interv. 2008;13(02):93–6.
68. Wansheng H, Jing G, Fuming T, Weimei H, Jinghua C. The epidemiology investigation of adult fatty liver in Ronggui and its integrating intervention. Modern Hospitals. 2006;6(10):123–5.
69. Zhouping K, Liqin H, Jiafeng Z. Prevalence of fatty liver in the old people of Zhongshan. Guangzhou Med J. 2011;42(03):44–5.
70. Xinsheng L. Epidemiological analysis of fatty liver prevalence and its risk factors in some area of Zhongshan. Modern Hospitals. 2014;14(01):148–9.
71. Jinxiang M, Yongjian Z, Pingyan C, Yuqiang N, Shengli S, Yuyuan L. Epidemiological survey on fatty liver in rural area of Guangdong province. Chin J Public Health. 2007;23(07):874–6.
72. Deping S. Etiological analysis of 652 cases of fatty liver. Med J Ind Enterprise. 2003;16(02):2–4.
73. Ming S, Qing T. Risk factors for fatty liver among Nanjing University staff. Chin J School Health. 2005;26(10):882–3.
74. Jiangao F, Jun Z, Xinjian L, Rui L, Fei D, Xiaomin S. Epidemiological survey of prevalence of fatty liver and its risk factors in a general adult population of Shanghai. Chin J Liver Dis. 2005;13(02):9–14.
75. Li Q, Qing S, Hongxia G, Shuai L, Weixia J. Epidemiological surve y of prevalence of fatty liver and its risk factors in adult population of Chongming district, Shanghai. J Intern Med Concepts Pract. 2012;7(04):280–3.
76. Hongxia D, Fengxi D, Li Z, Tongxin Z, Ying T. Investigation of the prevalence of fatty liver in 761 adult patients and analysis of the related risk factors. Chin J Clin Gastroenterol. 2010;22(04):236–9.
77. Yaxue Z. The association between Alcohol and Fatty Liver in Jinchang Cohort. Master: Lan Zhou University; 2017.
78. Qiannan L, Jianbo C, Yanxia B, Yan W, Guangrong D. An epidemiological survey of alcoholic liver disease among staff of Yanchang Oilfield. J Clin Hepatol. 2017;33(09):1769–73.
79. Lina Q. Epidemiological investigation on prevalence and risk factors of fatty liver in adults in Yan'an City. Master: Yan'an University; 2015:1-48.
80. Xiaolan L, Ming T, Ping Z, Hongli Z, Xiaodong Z, Yan G. Analysisi of dangerous factors for alcoholic liver disease. Chin J Liver Dis. 2004;12(07):63–4.
81. Lei C, Yang H, Li Z, Xiaoqian Z, Xu Y. Epidemiological investigation of alcoholic liver disease among adults undergoing physical examination in Guiyang. Guizhou Med J. 2010;34(07):645–7.
82. Xun L, Fengmei L, Min D, Quan L, Ruixia L, Bi Z, Hong Z. Epidemiological study on prevalence rate and risk factors for fatty liver disease in workers in urban Bijie. Prev Treat Cardiovasc Dis. 2012;06(18):7–10.
83. Ling J, Dongsheng L, Dangping F. Investigation of fatty liver in 2536 healthy people. J Prevent Med Chin People's Liberation Army. 2008;26(05):377.
84. Youming L, Weixing C, Zhaohui Y, Min L, Youshi L, Genyun X. An epidemiological survey of alcoholic liver disease in Zhejiang province. Chin J Liver Dis. 2003;11(11):9–11.
85. Fengqin S, Yun Q. Clinical significance of ultrasonography in the diagnosis of fatty liver. J Baotou Med. 2009;33(04):203–4.

86. Guoliang Y, Zhaohui Y, Hong S, Junlin W, Wenyu W. Investigation on the prevalence of alcoholic liver disease in Xiangshan fishermen. Zhejiang J Prevent Med. 2005;17(06):15.
87. Zhongdong Z, Huimin L, Junping S, Guoqiang L. Clinical analysis of the relationship between fatty liver and chronic hepatitis B. Chin J Med. 2009;44(02):41–2.
88. Minxia P, Yekai W, Xiaojuan Z, Guoqiang Z. Epidemiological survey of prevalence of fatty liver and its risk factors in male fishmen of Zhoushan City. Chin J Health Lab Technol. 2011;21(05):1275–7+1279.
89. Yunfei Z, Weijun C. Epidemiological investigation of alcoholic fatty liver. J Mod Med Health. 2001;17(09):732–3.
90. Jia W, Quanfeng W, Xuefei Y. Analysis of the occuational physical examination on B-Ultrasonic fatty liver in Zhongyuan petroleum chemical company. Occup Health. 2008;24(05):423–4.
91. Shengqi W, Junjie W, Jing W. Investigation on the prevalence of alcoholic liver disease among outbound personnel at Henan port. Port Health Control. 2003;08(04):12–3.
92. Shunling H, Shuiqi D, Xuehong Z, Youjun Y, Meilian T, Changgeng Y. Epidemiological survey of alcoholic liver disease in Hunan province. J Chin Physician. 2005;07(03):426–7.
93. Longju Y, Xuyun M, Jianwei G, Lijian Z. Study on the related factors of fatty liver. J Chin Physician. 2003;05(01):92–3.
94. Zhiyou C, Zexin S. Study on fatty liver and its related factors. J Jilin Mil Med Coll Fourth Mil Med Univ. 2001;23(01):40.
95. Jie S. The status of epidemiological investigation and analysis of relevant factors about drinking and alcoholic liver disease in Dehui city. Doctor: Jilin University; 2008.
96. Shilin C, Xiaodan M, Bingyuan W, Aiqing X. An epidemiologic survey of alcoholic liver disease in some cities of Liaoning Province. J Pract Hepatol. 2010;13(06):428–35.
97. Xiaodong S, Qi W, Shumei H, Yuchun T, Jie S, Junqi N. Epidemiology and analysis on risk factors of non-infectious chronic diseases in adults in northeast China. J Jilin Univ. 2011;37(02):379–84.
98. Jinglian W, Linyan F, Xueyan Q. Prevalence of alcoholic liver disease in some Daur residents. Chin J Gen Pract. 2003;02(01):55–6.
99. Hsieh PH, Huang JY, Nfor ON, Lung CC, Ho CC, Liaw YP. Association of type 2 diabetes with liver cirrhosis: a nationwide cohort study. Oncotarget. 2017;8(46):81321–8.
100. Baima-Kangzhuo, Ouzhu-Luobu, Ciren-Yangzong, Luobu-Zhandui, La Y, Qiangba-Danzeng, Chaoying C, Ciren-Yangjin, Zeng D. Prevalence and risk factors of alcoholic liver disease among Tibetan native adults in Lhasa. Chin J Public Health 2016, 32(03):295-298.
101. Qiuyue Y, Lijuan Z, Peng X, Ji L, Hailong Z, Jingwei L. Analysis of related factors of alcoholic liver disease in jinzhou area. Chin J Misdiagn. 2011;11(28):6834.
102. Yaping W. Ultrasonic diagnosis of fatty liver and alcoholic liver. Chin J Ethnomed Ethnopharmacy. 2012;21(07):79.
103. Jinhui Y, Qiudong Z, Pengfen X, Dongmei H. Investigation of alcoholic liver disease in ethnic groups of Yuanjiang county in Yunnan. Chin J Gastroenterol Hepatol. 2011;20(12):1137–9.
104. Huang C, Lv XW, Xu T, Ni MM, Xia JL, Cai SP, Zhou Q, Li X, Yang Y, Zhang L, et al. Alcohol use in Hefei in relation to alcoholic liver disease: a multivariate logistic regression analysis. Alcohol. 2018;71(01):1–4.
105. Wenyu H. Clinical significance of ultrasonography in the diagnosis of fatty liver. Chin J Gen Pract. 2011;9(09):1464–5.
106. Wang H, Ma L, Yin Q, Zhang X, Zhang C. Prevalence of alcoholic liver disease and its association with socioeconomic status in north-eastern China. Alcohol Clin Exp Res. 2014;38(4):1035–41.
107. Xiaohua Y. Comparison of serum indicators of people with alcoholic fatty liver and nonalcoholic fatty liver. J Shandong Med Coll. 2010;32(03):175–8.
108. Tiemin L, Guochen Z. Discussion on fatty liver and its related pathogenic factors in civil servants. Occup Health. 2001;17(09):29–30.
109. Ying X, Jiong R, Jun Z. Epidemiological Survey of Prevalence of Fatty Liver and Risk Factors in the Uyghur and Han Nationality Patients of Shuimogou District. Xinjiang Med J. 2011;41(11):13–5+19.
110. Hua Y, Fenli Z, Yanqiong G, Xiaolan L, Jinyan L. Epidemiological study on alcohol consumption and alcoholic liver disease. Shaanxi Med J. 2015;44(07):917–8+920.
111. Hua Y, Xiaolan L, Jinyan L, Xiaoyan Z. Epidemiological analysis of alcoholic and non-alcoholic fatty liver in Shanxi and Gansu province. Chin J Gastroenterol Hepatol. 2007;16(04):347–50+353.
112. Sy AM, Ching R, Olivares G, Vinas C, Chang R, Bergasa NV. Hispanic ethnicity is associated with increased morbidity and mortality in patients with alcoholic liver disease. Ann Hepatol. 2017;16(1):169–71.
113. Hourigan KJ, Bowling FG. Alcoholic liver disease: a clinical series in an Australian private practice. J Gastroenterol Hepatol. 2001;16(10):1138–43.
114. Lieber CS, Weiss DG, Morgan TR, Paronetto F. Aspartate aminotransferase to platelet ratio index in patients with alcoholic liver fibrosis. Am J Gastroenterol. 2006;101(7):1500–8.
115 Barritt AST, Jiang Y, Schmidt M, Hayashi PH, Bataller R. Charges for alcoholic cirrhosis exceed all other etiologies of cirrhosis combined: a national and state inpatient survey analysis. Dig Dis Sci. 2019;64(6):1460–9.
116. Pinon-Gutierrez R, Durbin-Johnson B, Halsted CH, Medici V. Clinical features of alcoholic hepatitis in latinos and caucasians: a single center experience. World J Gastroenterol. 2017;23(40):7274–82.
117. Fong TL, Kanel GC, Conrad A, Valinluck B, Charboneau F, Adkins RH. Clinical significance of concomitant hepatitis C infection in patients with alcoholic liver disease. Hepatology (Baltimore, MD). 1994;19(3):554–7.
118. Jinjuvadia R, Jinjuvadia C, Puangsricharoen P, Chalasani N, Crabb DW, Liangpunsakul S, Translational R. Evolving alcoholic hepatitis treatment C: concomitant psychiatric and nonalcohol-related substance use disorders among hospitalized patients with alcoholic liver disease in the United States. Alcohol Clin Exp Res. 2018;42(2):397–402.
119. Fan X, McCullough RL, Huang E, Bellar A, Kim A, Poulsen KL, McClain CJ, Mitchell M, McCullough AJ, Radaeva S, et al. Diagnostic and prognostic significance of complement in patients with alcohol-associated hepatitis. Hepatology (Baltimore, MD). 2021;73(3):983–97.
120. Douds AC, Cox MA, Iqbal TH, Cooper BT. Ethnic differences in cirrhosis of the liver in a British city: alcoholic cirrhosis in South Asian men. Alcohol Alcohol. 2003;38(2):148–50.
121. Levy R, Catana AM, Durbin-Johnson B, Halsted CH, Medici V. Ethnic differences in presentation and severity of alcoholic liver disease. Alcohol Clin Exp Res. 2015;39(3):566–74.
122. Rajbhandari R, Danford CJ, Chung RT, Ananthakrishnan AN. HBV infection is associated with greater mortality in hospitalised patients compared to HCV infection or alcoholic liver disease. Aliment Pharmacol Ther. 2015;41(10):928–38.
123. Waleed M, Abdallah MA, Kuo YF, Arab JP, Wong R, Singal AK. Higher frequency of hospital-acquired infections but similar in-hospital mortality among admissions with alcoholic hepatitis at academic vs. Non-academic Centers. Front Physiol. 2020;11(06):1–9.
124. Mills PR, MacSween RN, Dick HM, Hislop WS. Histocompatibility antigens in patients with alcoholic liver disease in Scotland and northeastern England: failure to show an association. Gut. 1988;29(2):146–8.
125. Heslin KC, Elixhauser A, Steiner CA. Identifying in-patient costs attributable to the clinical sequelae and comorbidities of alcoholic liver disease in a national hospital database. Addiction (Abingdon, England). 2017;112(5):782–91.
126. Singal AK, Sagi S, Kuo YF, Weinman S. Impact of hepatitis C virus infection on the course and outcome of patients with acute alcoholic hepatitis. Eur J Gastroenterol Hepatol. 2011;23(3):204–9.
127. Ladhani S, Hirode G, Singal AK, Wong RJ. Impact of safety-net burden on in-hospital mortality and hospitalization costs among patients with alcoholic hepatitis and alcoholic cirrhosis. Alcohol Alcohol. 2021;56(3):368–75.
128. Nahon P, Nuraldeen R, Rufat P, Sutton A, Trautwein C, Strnad P. In alcoholic cirrhosis, low-serum hepcidin levels associate with poor long-term survival. Liver Int. 2016;36(2):185–8.
129. Lamm K, McCarter M, Russo MW. Is there a futility discriminant function score for alcoholic hepatitis? J Clin Med. 2021;10(13):1–8.
130. Srikureja W, Kyulo NL, Runyon BA, Hu KQ. MELD score is a better prognostic model than Child-Turcotte-Pugh score or Discriminant Function score in patients with alcoholic hepatitis. J Hepatol. 2005;42(5):700–6.
131. Guyot E, Sutton A, Rufat P, Laguillier C, Mansouri A, Moreau R, Ganne-Carrie N, Beaugrand M, Charnaux N, Trinchet JC, et al. PNPLA3 rs738409, hepatocellular carcinoma occurrence and risk model prediction in patients with cirrhosis. J Hepatol. 2013;58(2):312–8.

132. Fan X, Huang X, Hershman M, Zheng X, Jiang C, Yue B, Weisberg I. Portal vein thrombosis prevalence and mortality among alcoholic cirrhosis in a nationwide inpatient cohort. Eur J Gastroenterol Hepatol. 2020;32(9):1160–7.
133. Mendenhall CL, Anderson S, Weesner RE, Goldberg SJ, Crolic KA. Protein-calorie malnutrition associated with alcoholic hepatitis. Am J Med. 1984;76(2):211–22.
134. Lowenfels AB, Maisonneuve P, Grover H, Gerber E, Korsten MA, Antunes MT, Marques A, Pitchumoni CS. Racial factors and the risk of chronic pancreatitis. Am J Gastroenterol. 1999;94(3):790–4.
135. Beaudoin JJ, Liang T, Tang Q, Banini BA, Shah VH, Sanyal AJ, Chalasani NP, Gawrieh S. Role of candidate gene variants in modulating the risk and severity of alcoholic hepatitis. Alcohol Clin Exp Res. 2021;45(4):709–19.
136. Makar M, Reja D, Chouthai A, Kabaria S, Patel AV. The impact of acute kidney injury on mortality and clinical outcomes in patients with alcoholic cirrhosis in the USA. Eur J Gastroenterol Hepatol. 2021;33(6):905–10.
137. May FP, Rolston VS, Tapper EB, Lakshmanan A, Saab S, Sundaram V. The impact of race and ethnicity on mortality and healthcare utilization in alcoholic hepatitis: a cross-sectional study. BMC Gastroenterol. 2016;16(1):129.
138. Nasir M, Vinsard DG, Wakefield D, Karagozian R. The important role of immunization in alcoholic and non-alcoholic chronic liver disease: a population-based study. J Dig Dis. 2020;21(10):583–92.
139. Lee EY, Xuan Mai TT, Chang Y, Ki M. Trends of liver cancer and its major risk factors in Korea. Epidemiol Health. 2015;37(06):e2015016.
140. Israelsen M, Misas MG, Koutsoumourakis A, Hall A, Covelli C, Buzzetti E, Prat LI, Roccarina D, Luong TV, Quaglia A, et al. Collagen proportionate area predicts long-term mortality in patients with alcoholic hepatitis. Dig Liver Dis. 2022;54(5):663–8.
141. Arab JP, Diaz LA, Baeza N, Idalsoaga F, Fuentes-Lopez E, Arnold J, Ramirez CA, Morales-Arraez D, Ventura-Cots M, Alvarado-Tapias E, et al. Identification of optimal therapeutic window for steroid use in severe alcohol-associated hepatitis: a worldwide study. J Hepatol. 2021;75(5):1026–33.
142. Sullivan MK, Daher HB, Rockey DC. Normal or near normal aminotransferase levels in patients with alcoholic cirrhosis. Am J Med Sci. 2022;363(6):484–9.
143. Morales-Arraez D, Ventura-Cots M, Altamirano J, Abraldes JG, Cruz-Lemini M, Thursz MR, Atkinson SR, Sarin SK, Kim W, Chavez-Araujo R, et al. The MELD score is superior to the maddrey discriminant function score to predict short-term mortality in alcohol-associated hepatitis: a global study. Am J Gastroenterol. 2022;117(2):301–10.
144. Laswi H, Abusalim AR, Warraich MS, Khoshbin K, Shaka H. Trends and outcomes of alcoholic liver cirrhosis hospitalizations in the last two decades: analysis of the nationwide inpatient sample. Gastroenterology Res. 2022;15(2):91–9.
145. Sofair AN, Barry V, Manos MM, Thomas A, Zaman A, Terrault NA, Murphy RC, Stabach N, Huie S, Van Ness G, et al. The epidemiology and clinical characteristics of patients with newly diagnosed alcohol-related liver disease: results from population-based surveillance. J Clin Gastroenterol. 2010;44(4):301–7.
146. Fengyi L, Yong'an Y, Jinhui S, Daoming Z, Xianjun Z. Distribution research on the clinical data of 199 cases with alcoholic fibrosis. Chin Arch Tradit Chin Med. 2009;27(06):1250–3.
147. Guonv Z, Xiangjiu H. Diagnostic value of B-ultrasound in alcoholic liver disease. J Med Sci YanBian Univ. 1991;03:206–7.
148. Liyan L. Genetic polymorphism and mRNA levels of CYP1A1 and PPRAα in alcoholic liver disease. Doctor: Jilin Universisty; 2011.
149. Ying L. Genetic polymorphism and mRNA levels of CYP450IIE1 and GSTP1 in alcoholic liver disease. Doctor: Jilin University; 2009.
150. Yang Y, Yanan H. Clinical value of ultrasonography in the diagnosis of alcoholic liver disease. Clin Focus. 2012;27(17):1537–9.
151. Jianqiang H, Jun C, Yan T. Relevant factors and clinical treatment of alcoholic liver disease between Li minority and Han people. J Hainan Med Univ. 2011;17(09):1175–8.
152. Li L, Anxin Z, Fuhe C. Clinical analysis of 64 cases of alcoholic liver diseases. J Mod Med Health. 2008;24(10):1484–5.
153. Yonghui Q. Clinical characteristics of 62 patients with alcoholic liver disease. China Trop Med. 2014;14(05):639–40.
154. Ruiqiao Y, Xinhua Z, Xuemei T, Cuiying G, Li S, Jianguo W, Xiaoyan M, Ziman N, Jitan S, Bingyuan W. Investigation on the relationship between alcohol consumption and alcoholic fatty liver among ethnic minorities in Xinjiang. Chin J Liver Dis. 2005;13(11):63–5.
155. Keqin S, Houdong L, Li J. Clinicopathological observation of alcoholic liver disease in Tibetan people at high altitude. Tibet Sci Technol. 2000;06:11–3.
156. Maoqiang L. Clinical analysis of 62 cases of alcoholic liver diseases. Med Inform. 2010;23(08):2649.
157. Anqin C. Clinical analysis of 76 cases of alcoholic liver disease. For all Health. 2013;7(20):158.
158. Zhaowen L, Wenheng H, Minggu Z. Study on the risk factors influencing the prognosis of alcoholic liver disease. Inner Mongolia Med J. 2018;50(11):1337–8.
159. Dou W, Ying Y, Yingqian D. Epidemiological study on alcoholic liver disease in Xigaze area. World Latest Med. 2018;18(78):210–1+217.
160. Xiaolan L, Miyan T, Yan G, Ping Z, Hongli Z. Epidemiology of alcoholic liver diseases in Xi'an. World Chin J Dig. 2003;11(06):719–22.
161. Min S, Chunying L. Clinical analysis of 112 cases of alcoholic liver diseases. J Zhangjiakou Med Coll. 2004;21(01):64–5.
162. Xie Y-D, Feng B, Gao Y, Wei L. Characteristics of alcoholic liver disease and predictive factors for mortality of patients with alcoholic cirrhosis. Hepatobiliary Pancreat Dis Int. 2013;12(6):594–601.
163. Arun AC, Ilangovan N, Rajma J. Risk factors for alcohol use relapse after abstinence in patients with alcoholic liver disease. J Fam Med Prim Care. 2020;9(12):5995–9.
164. Cichoz-Lach H, Partycka J, Nesina I, Celinski K, Slomka M, Wojcierowski J. Alcohol dehydrogenase and aldehyde dehydrogenase gene polymorphism in alcohol liver cirrhosis and alcohol chronic pancreatitis among Polish individuals. Scand J Gastroenterol. 2007;42(4):493–8.
165. Faizallah R, Woodrow JC, Krasner NK, Walker RJ, Morris AI. Are HLA antigens important in the development of alcohol-induced liver disease? Br Med J (Clin Res Ed). 1982;285(6341):533–4.
166. Lee HC, Lee HS, Jung SH, Yi SY, Jung HK, Yoon JH, Kim CY. Association between polymorphisms of ethanol-metabolizing enzymes and susceptibility to alcoholic cirrhosis in a Korean male population. J Korean Med Sci. 2001;16(6):745–50.
167. Kwon SY, Ahn MS, Chang HJ. Clinical significance of hepatitis C virus infection to alcoholics with cirrhosis in Korea. J Gastroenterol Hepatol. 2000;15(11):1282–6.
168. Vaz K, Little R, Majeed A, Kemp W, Roberts SK. Determinants of short- and long-term outcomes of an Australian cohort of patients admitted with alcoholic hepatitis. Dig Dis Sci. 2022;67(7):3356–65.
169. Serra MA, Escudero A, Rodriguez F, del Olmo JA, Rodrigo JM. Effect of hepatitis C virus infection and abstinence from alcohol on survival in patients with alcoholic cirrhosis. J Clin Gastroenterol. 2003;36(2):170–4.
170. Mathurin P, Beuzin F, Louvet A, Carrie-Ganne N, Balian A, Trinchet JC, Dalsoglio D, Prevot S, Naveau S. Fibrosis progression occurs in a subgroup of heavy drinkers with typical histological features. Aliment Pharmacol Ther. 2007;25(9):1047–54.
171. Tan JH, Jin YC, Cao RC, Zhou L, Zhang GW. Risk factors for the concomitant occurrence of alcoholic chronic pancreatitis and alcoholic liver cirrhosis: a 10-years cohort study at a tertiary hospital in China. Eur J Gastroenterol Hepatol. 2020;32(9):1229–34.
172. Bhattacharyya M, Barman NN, Goswami B. Survey of alcohol-related cirrhosis at a tertiary care center in North East India. Indian J Gastroenterol. 2016;35(3):167–72.
173. Vijayakumar S, Viswanathan S, Jain D. Utility of platelet indices in alcoholic hepatitis: a retrospective study. Porto Biomed J. 2020;5(5):e082-089.
174. Raynard B, Balian A, Fallik D, Capron F, Bedossa P, Chaput JC, Naveau S. Risk factors of fibrosis in alcohol-induced liver disease. Hepatology (Baltimore, MD). 2002;35(3):635–8.
175. Wei DM, Jiao HB, Liu YT, Zhao J, Hanbai BYL, Tong J, Wang BY. Clinical diagnosis of alcoholic hepatitis in Tongliao City, Inner Mongolia. Chin J Hepatol. 2021;29(9):861–6.
176. Chang L, Ying W, Bingyuan W, Bing C, Xiaohu H, Guoqing X, Xiaodan M. Clinical characteristics and curative effect analysis of 88 patients with alcoholic hepatitis. Drug Eval. 2007;4(02):110–3.

177. Chao G. Association between PNPLA3 gene polymorphism and genetic susceptibility to alcoholic liver disease. Master: Shanxi Medical University; 2014.
178. Lixia W. Clinical analysis of 164 patients with alcoholic liver disease. Master: Dalian Medical University; 2004.
179. Caiyan Z, Yadong W, Pingping Z. Analysis on clinical features of fatty liver disease and its risk factors. Clinical Focus. 2008;23(04):247–51.
180. Allen JP, Litten RZ. Recommendations on use of biomarkers in alcoholism treatment trials. Alcohol Clin Exp Res. 2003;27(10):1667–70.
181. Pessione F, Ramond MJ, Njapoum C, Duchatelle V, Degott C, Erlinger S, Rueff B, Valla DC, Degos F. Cigarette smoking and hepatic lesions in patients with chronic hepatitis C. Hepatology (Baltimore, MD). 2001;34(1):121–5.
182. Jinzhong Z, Xiuzhi Z, Ningning L, Yanfei L, Xiaoli L, Chunyan K, Jie C. Analysis of the effects of smoking and drinking on alcoholic fatty liver disease. J Henan Med Coll. 2018;30(04):327–30.
183. Otete HE, Orton E, Fleming KM, West J. Alcohol-attributable healthcare attendances up to 10 years prior to diagnosis of alcoholic cirrhosis: a population based case-control study. Liver Int. 2016;36(4):538–46.
184. Spicak J, Pulkertova A, Kralova-Lesna I, Suchanek P, Vitaskova M, Adamkova V. Alcoholic chronic pancreatitis and liver cirrhosis: coincidence and differences in lifestyle. Pancreatology. 2012;12(4):311–6.
185. Pradhan B, Hadengue A, Chappuis F, Chaudhary S, Baral D, Gache P, Karki P, Rijal S. Alcoholic liver disease in Nepal: identifying homemade alcohol as a culprit. Clin Exp Gastroenterol. 2015;2015(08):183–9.
186. Mancebo A, González-Diéguez ML, Cadahía V, Varela M, Pérez R, Navascués CA, Sotorríos NG, Martínez M, Rodrigo L, Rodríguez M. Annual incidence of hepatocellular carcinoma among patients with alcoholic cirrhosis and identification of risk groups. Clin Gastroenterol Hepatol. 2013;11(1):95–101.
187. Poynard T, Abella A, Pignon JP, Naveau S, Leluc R, Chaput JC. Apolipoprotein AI and alcoholic liver disease. Hepatology (Baltimore, MD). 1986;6(6):1391–5.
188. Zeng D, Huang Q, Yu Z, Wu H. Association between aldehyde dehydrogenase 2 gene rs671 G>A polymorphism and alcoholic liver cirrhosis in southern Chinese Hakka population. J Clin Lab Anal. 2021;35(7):e23855.
189. Ratib S, Fleming KM, Crooks CJ, Walker AJ, West J. Causes of death in people with liver cirrhosis in England compared with the general population: a population-based cohort study. Am J Gastroenterol. 2015;110(8):1149–58.
190. Ganne-Carrie N, Chaffaut C, Bourcier V, Archambeaud I, Perarnau JM, Oberti F, Roulot D, Moreno C, Louvet A, Dao T, et al. Estimate of hepatocellular carcinoma incidence in patients with alcoholic cirrhosis. J Hepatol. 2018;69(6):1274–83.
191. Stickel F, Lutz P, Buch S, Nischalke HD, Silva I, Rausch V, Fischer J, Weiss KH, Gotthardt D, Rosendahl J, et al. Genetic variation in HSD17B13 reduces the risk of developing cirrhosis and hepatocellular carcinoma in alcohol misusers. Hepatology (Baltimore, MD). 2020;72(1):88–102.
192. Otete H, Deleuran T, Fleming KM, Card T, Aithal GP, Jepsen P, West J. Hip fracture risk in patients with alcoholic cirrhosis: a population-based study using English and Danish data. J Hepatol. 2018;69(3):697–704.
193. Louvet A, Labreuche J, Artru F, Bouthors A, Rolland B, Saffers P, Lollivier J, Lemaitre E, Dharancy S, Lassailly G, et al. Main drivers of outcome differ between short term and long term in severe alcoholic hepatitis: a prospective study. Hepatology (Baltimore, MD). 2017;66(5):1464–73.
194. Adejumo AC, Cholankeril G, Iqbal U, Yoo ER, Boursiquot BC, Concepcion WC, Kim D, Ahmed A. Readmission rates and associated outcomes for alcoholic hepatitis: a nationwide cohort study. Dig Dis Sci. 2020;65(4):990–1002.
195. Pathak OK, Paudel R, Panta OB, Pant HP, Giri BR, Adhikari B. Retrospective study of the clinical profile and prognostic indicators in patients of alcoholic liver disease admitted to a tertiary care teaching hospital in Western Nepal. Saudi J Gastroenterol. 2009;15(3):171–5.
196. Wang X, Lin SX, Tao J, Wei XQ, Liu YT, Chen YM, Wu B. Study of liver cirrhosis over ten consecutive years in Southern China. World J Gastroenterol. 2014;20(37):13546–55.
197. Bjornsson ES, Hauksson K, Sigurdardottir R, Arnardottir M, Agustsson AS, Lund SH, Kalaitzakis E. Abstinence from alcohol and alcohol rehabilitation therapy in alcoholic liver disease: a population-based study. Scand J Gastroenterol. 2020;55(4):472–8.
198. Silva João M, Silva Mário J, Calinas F, Nogueira Paulo J. Burden of Liver Cirrhosis in Portugal between 2010 and 2017. GE Port J Gastroenterol. 2021;28(3):153–61.
199. Tanaka T, Yabusako T, Yamashita T, Kondo K, Nishiguchi S, Kuroki T, Monna T. Contribution of hepatitis C virus to the progression of alcoholic liver disease. Alcohol Clin Exp Res. 2000;24(4 Suppl):112S-116S.
200. Gonçalves PL, da Penha Z-G, Marques CC, Mendonça AT, Gonçalves CS, Pereira FEL. Etiology of liver cirrhosis in Brazil: chronic alcoholism and hepatitis viruses in liver cirrhosis diagnosed in the state of Espírito Santo. Clinics. 2013;68(3):291–5.
201. Thuluvath PJ, Ahn E, Nguyen GC. Hepatitis C as a prognostic indicator among noncirrhotic patients hospitalized with alcoholic hepatitis. Can J Gastroenterol. 2013;27(11):639–42.
202. Fleming KM, Aithal GP, Solaymani-Dodaran M, Card TR, West J. Incidence and prevalence of cirrhosis in the United Kingdom, 1992–2001: a general population-based study. J Hepatol. 2008;49(5):732–8.
203. Appel-da-Silva MC, Miozzo SA, Dossin IA, Tovo CV, Branco F, de Mattos AA. Incidence of hepatocellular carcinoma in outpatients with cirrhosis in Brazil: A 10-year retrospective cohort study. World J Gastroenterol. 2016;22(46):10219–25.
204. Nilsson E, Anderson H, Sargenti K, Lindgren S, Prytz H. Incidence, clinical presentation and mortality of liver cirrhosis in Southern Sweden: a 10-year population-based study. Aliment Pharmacol Ther. 2016;43(12):1330–9.
205. Kalaitzakis E, Gunnarsdottir SA, Josefsson A, Bjornsson E. Increased risk for malignant neoplasms among patients with cirrhosis. Clin Gastroenterol Hepatol. 2011;9(2):168–74.
206. Gunnarsdottir SA, Olsson R, Olafsson S, Cariglia N, Westin J, Thjodleifsson B, Bjornsson E. Liver cirrhosis in Iceland and Sweden: incidence, aetiology and outcomes. Scand J Gastroenterol. 2009;44(8):984–93.
207. Kim WR, Gross JB Jr, Poterucha JJ, Locke GR 3rd, Dickson ER. Outcome of hospital care of liver disease associated with hepatitis C in the United States. Hepatology (Baltimore, MD). 2001;33(1):201–6.
208. Fernandes SR, Marques da Costa P, Vitor S, Carvalho JR, Santos P, Moura CM, Cortez-Pinto H, Ramalho F, Velosa J. Predicting short-term and long-term mortality of hospitalized Portuguese patients with alcoholic hepatitis. Eur J Gastroenterol Hepatol. 2017;29(10):1141–8.
209. Jeong JY, Lim S, Sohn JH, Lee JG, Jun DW, Kim Y. Presence of sarcopenia and its rate of change are independently associated with long-term mortality in patients with liver cirrhosis. J Korean Med Sci. 2018;33(50):1–13.
210. Tsutsumi M, Ishizaki M, Takada A. Relative risk for the development of hepatocellular carcinoma in alcoholic patients with cirrhosis: a multiple logistic-regression coefficient analysis. Alcohol Clin Exp Res. 1996;20(4):758–62.
211. N'Kontchou G, Paries J, Htar MT, Ganne-Carrie N, Costentin L, Grando-Lemaire V, Trinchet JC, Beaugrand M. Risk factors for hepatocellular carcinoma in patients with alcoholic or viral C cirrhosis. Clin Gastroenterol Hepatol. 2006;4(8):1062–8.
212. Huang HH, Lin HH, Shih YL, Chen PJ, Chang WK, Chu HC, Chao YC, Hsieh TY. Spontaneous intracranial hemorrhage in cirrhotic patients. Clin Neurol Neurosurg. 2008;110(3):253–8.
213. Silva MJ, Rosa MV, Nogueira PJ, Calinas F. Ten years of hospital admissions for liver cirrhosis in Portugal. Eur J Gastroenterol Hepatol. 2015;27(11):1320–6.
214. Said A, Williams J, Holden J, Remington P, Musat A, Lucey M. The prevalence of alcohol-induced liver disease and hepatitis C and their interaction in a tertiary care setting. Clin Gastroenterol Hepatol. 2004;2(10):928–34.
215. Serste T, Cornillie A, Njimi H, Pavesi M, Arroyo V, Putignano A, Weichselbaum L, Deltenre P, Degre D, Trepo E, et al. The prognostic value of acute-on-chronic liver failure during the course of severe alcoholic hepatitis. J Hepatol. 2018;69(2):318–24.
216. Armstrong PR, Ring E, MacNicholas R. A decade of rising alcoholic liver disease hospital admissions and deaths in Irish hospitals, 2007–2016: a retrospective cross-sectional analysis. Eur J Gastroenterol Hepatol. 2022;34(6):671–7.
217. Tailakh MA, Poupko L, Kayyal N, Alsana A, Estis-Deaton A, Etzion O, Fich A, Yardni D, Abu-Freha N. Liver cirrhosis, etiology and clinical characteristics disparities among minority population. J Immigr Minor Health. 2022;24(5):1122–8.

218. Daoming Z, Yuanxin W, Jingbo Z, Tailing W, Lan Z, Kelun Z. Clinical analysis of 124 cases of alcoholic liver disease. Chin J Liver Dis. 1995;11(04):224.
219. Cuijuan Z, Hui J. Detection and analysis of hepatitis virus in 150 patients with alcoholic liver disease. J Med Inform. 2010;23(06):1999.
220. Yiqiang Z. Clinical analysis of 70 cases of alcoholic liver disease. Chin Pract Med. 2009;4(19):88–9.
221. Changyan C. Clinical characteristics and therapeutic effect of 76 cases of alcoholic liver disease. China Clin Pract Med. 2008;2(12):56–7.
222. Ming Z. Etiological analysis of liver cirrhosis of 824cases. Chongqing medicien. 2006;35(5):438–41.
223. Liang L, Chuntao L, Hui Z. Clinical diagnosis and treatment of 89 cases of alcoholic liver disease. Guide China Med. 2012;10(25):141–2.
224. Shaopeng K, Wanchao L, Zhijun S, Qi L, Yongnian L, Meiyu S. Clinical analysis of 168 cases of alcoholic liver diseases. Chin J Integr Tradit West Med Liver Dis. 1999;09(S1):77–9.
225. Baochun Y. Clinical analysis of 58 cases of alcoholic liver diseases. Anthology Med. 2005;24(05):727–9.
226. Mengshan J. Clinical diagnosis and treatment of 70 cases of alcoholic liver disease. Chin Med Herald. 2009;6(25):154.
227. Chunhua L. Clinical analysis of 78 cases of alcoholic liver diseases. Guide China Med. 2011;9(32):66–7.
228. Hairu H. Clinical diagnosis and treatment of 85 cases of alcoholic liver disease. China Pract Med. 2009;4(20):123–4.
229. Haiying Y, Yun L. Causes and nursing care of patients with alcoholic liver disease who continue to drink. J Mod Med Health. 2009;25(17):2649–50.
230. Houji T, Yaonan Z, Chunlei L. Clinical observation of alcoholic liver disease. J Youjiang Med Univ Nationalities. 2006;01(06):963–4.
231. Yu M. Analysis of clinical characteristics and prognosis of alcoholic liver disease. China Pract Med. 2012;7(05):112–3.
232. Yu T, Ye H, XiaoJuan W. Analysis of related factors influencing alcoholic liver disease. China Pract Med. 2011;6(25):98–9.
233. Nan J. Investigation on the factors influencing alcoholic liver disease. Securities Futures China. 2011;2011(03):128.
234. Jianan H. Analysis of the related factors affecting alcoholic liver disease. J Youjiang Med Univ Nationalities. 2008;01(01):42–3.
235. Chuanfeng L, Xiang Q, Yunfeng P. Clinical analysis of 146 cases of alcoholic liver diseases. Chin J Clini Hepatol. 2004;20(03):157–8.
236. Yue Z, Jiangao F, Zhengli Y. Clinical analysis of 59 cases of alcoholic liver diseases. Chin Hepatol. 2003;08(02):62–3.
237. Morgan MY, Sharma M, Atkinson SR. Genetic and Environmental Susceptibility to Alcoholic Hepatitis. Clin Liver Dis. 2021;25(3):517–35.
238. Zhidong L. Analysis of ultrasonography in 132 cases of alcoholic liver disease. Guide Chin Med. 2012;10(36):491–2.
239. Maocong Y, Yang L, Zhen X, Xiuzhen Y. Clinical features of patients with alcoholic liver disease: an analysis of 155 cases. J Pract Hepatol. 2017;20(01):60–4.
240. Nalpas B, Hispard E, Thépot V, Pot S, Dally S, Berthelot P. A comparative study between carbohydrate-deficient transferrin and gamma-glutamyltransferase for the diagnosis of excessive drinking in a liver unit. J Hepatol. 1997;27(6):1003–8.
241. Sujan R, Cruz-Lemini M, Altamirano J, Simonetto DA, Maiwall R, Axley P, Richardson T, Desai V, Cabezas J, Vargas V, et al. A validated score predicts acute kidney injury and survival in patients with alcoholic hepatitis. Liver Transpl. 2018;24(12):1655–64.
242. Hamlyn AN. Alcoholic liver disease in women. Br Med J. 1977;1(6068):1085–6.
243. Alves PS, Correia JP, Borda d' Agua C, Portugal L, Capaz V, Rodrigues ML, Rodrigues HL. Alcoholic liver diseases in Portugal Clinical and laboratory picture, mortality, and survival. Alcohol Clin Exp Res. 1982;6(2):216–24.
244. Ravi S, Bade KS, Hasanin M, Singal AK. Ammonia level at admission predicts in-hospital mortality for patients with alcoholic hepatitis. Gastroenterol Rep (Oxf). 2017;5(3):232–6.
245. Goyal SK, Dixit VK, Jain AK, Mohapatra PK, Ghosh JK. Assessment of the Model for End-stage Liver Disease (MELD) Score in Predicting Prognosis of Patients with Alcoholic Hepatitis. J Clin Exp Hepatol. 2014;4(1):19–24.
246. Gluud C, Tage-Jensen U. Autoantibodies and immunoglobulins in alcoholic steatosis and cirrhosis. Acta Med Scand. 1983;214(1):61–6.
247. Sahlman P, Nissinen M, Pukkala E, Farkkila M. Cancer incidence among alcoholic liver disease patients in Finland: A retrospective registry study during years 1996–2013. Int J Cancer. 2016;138(11):2616–21.
248. Krasner N, Davis M, Portmann B, Williams R. Changing pattern of alcoholic liver disease in Great Britain: relation to sex and signs of autoimmunity. Br Med J. 1977;1(6075):1497–500.
249. Deleuran T, Gronbaek H, Vilstrup H, Jepsen P. Cirrhosis and mortality risks of biopsy-verified alcoholic pure steatosis and steatohepatitis: a nationwide registry-based study. Aliment Pharmacol Ther. 2012;35(11):1336–42.
250. Potter JF, James OF. Clinical features and prognosis of alcoholic liver disease in respect of advancing age. Gerontology. 1987;33(6):380–7.
251. Ray S, Khanra D, Sonthalia N, Kundu S, Biswas K, Talukdar A, Saha M, Bera H. Clinico-biochemical correlation to histological findings in alcoholic liver disease: a single centre study from eastern India. J Clin Diagn Res. 2014;8(10):MC01-05.
252. Naveau S, Giraud V, Borotto E, Aubert A, Capron F, Chaput JC. Excess weight risk factor for alcoholic liver disease. Hepatology (Baltimore, MD). 1997;25(1):108–11.
253. Chang C, Wang TJ, Chen MJ, Liang SY, Wu SF, Bai MJ. Factors influencing readiness to change in patients with alcoholic liver disease: a cross-sectional study. J Psychiatr Ment Health Nurs. 2020;28(3):344–55.
254. Sagnelli E, Stroffolini T, Sagnelli C, Pirisi M, Babudieri S, Colloredo G, Russello M, Coppola N, Gaeta GB, Cacopardo B, et al. Gender differences in chronic liver diseases in two cohorts of 2001 and 2014 in Italy. Infection. 2018;46(1):93–101.
255. Pares A, Barrera JM, Caballeria J, Ercilla G, Bruguera M, Caballeria L, Castillo R, Rodes J. Hepatitis C virus antibodies in chronic alcoholic patients: association with severity of liver injury. Hepatology (Baltimore, MD). 1990;12(6):1295–9.
256. Guilera M, Saiz JC, Lopez-Labrador FX, Olmedo E, Ampurdanes S, Forns X, Bruix J, Pares A, Sanchez-Tapias JM, Jimenez de Anta MT, et al. Hepatitis G virus infection in chronic liver disease. Gut. 1998;42(1):107–11.
257. Gracey M, Bobongie F. Hospitalization of Aboriginal adults for digestive disorders in Western Australia, 1989–91. J Gastroenterol Hepatol. 1995;10(3):313–8.
258. Saunders JB, Wodak AD, Morgan-Capner P, White YS, Portmann B, Davis M, Williams R. Importance of markers of hepatitis B virus in alcoholic liver disease. Br Med J (Clin Res Ed). 1983;286(6381):1851–4.
259. Barrio E, Tome S, Rodriguez I, Gude F, Sanchez-Leira J, Perez-Becerra E, Gonzalez-Quintela A. Liver disease in heavy drinkers with and without alcohol withdrawal syndrome. Alcohol Clin Exp Res. 2004;28(1):131–6.
260. Hagstrom H, Thiele M, Roelstraete B, Soderling J, Ludvigsson JF. Mortality in biopsy-proven alcohol-related liver disease: a population-based nationwide cohort study of 3453 patients. Gut. 2021;70(1):170–9.
261. Liang W, Chikritzhs T, Pascal R, Binns CW. Mortality rate of alcoholic liver disease and risk of hospitalization for alcoholic liver cirrhosis, alcoholic hepatitis and alcoholic liver failure in Australia between 1993 and 2005. Intern Med J. 2011;41(1a):34–41.
262. Husain A, Chiwhane A, Kirnake V. Non-invasive assessment of liver fibrosis in alcoholic liver disease. Clin Exp Hepatol. 2020;6(2):125–30.
263. Santolaria F, Pérez-Manzano JL, Milena A, González-Reimers E, Gómez-Rodríguez MaA, Martínez-Riera A, Alemán-Valls MaR, de la Vega-Prieto MaJ. Nutritional assessment in alcoholic patients. Its relationship with alcoholic intake, feeding habits, organic complications and social problems. Drug and Alcohol Dependence. 2000;59(3):295–304.
264. Singh KR, Muktesh G, Gunjan D, Kochhar R, Singh V, Das A, Siddappa P, Singh K. Patterns of alcohol consumption and nutrition intake in patients with alcoholic liver disease and alcoholic pancreatitis in North Indian men. JGH Open. 2019;3(4):316–21.
265. Semb S, Neermark S, Dam-Larsen S, Franzmann MB, Albrectsen J, Kallemose T, Becker U, Bendtsen F. Presence of alcoholic steatohepatitis, but no selective histological feature, indicates an increased risk of cirrhosis and premature death. Scand J Gastroenterol. 2016;51(11):1367–74.
266. Sarin SK, Malhotra V, Nayyar A, Sundaram KR, Broor SL. Profile of alcoholic liver disease in an Indian hospital. A prospective analysis. Liver. 1988;8(3):132–7.
267. Fujimoto M, Uemura M, Kojima H, Ishii Y, Ann T, Sakurai S, Okuda K, Noguchi R, Adachi S, Kitano H, et al. Prognostic factors in severe alcoholic liver injury. Nara Liver Study Group. Alcohol Clin Exp Res. 1999;23(4 Suppl):33S-38S.

268. Chen WX, Li YM, Yu CH, Cai WM, Zheng M, Chen F. Quantitative analysis of transforming growth factor beta 1 mRNA in patients with alcoholic liver disease. World J Gastroenterol. 2002;8(2):379–81.
269. Levi AJ, Chalmers DM. Recognition of alcoholic liver disease in a district general hospital. Gut. 1978;19(6):521–5.
270 Hagstrom H, Thiele M, Sharma R, Simon TG, Roelstraete B, Soderling J, Ludvigsson JF. Risk of cancer in biopsy-proven alcohol-related liver disease: a population-based cohort study of 3410 persons. Clin Gastroenterol Hepatol. 2022;20(4):918-929 e918.
271. Wagnerberger S, Schafer C, Bode C, Parlesak A. Saturation of retinol-binding protein correlates closely to the severity of alcohol-induced liver disease. Alcohol. 2006;38(1):37–43.
272. Nøjgaard C, Johansen JS, Christensen E, Skovgaard LT, Price PA, Becker U. Serum levels of YKL-40 and PIIINP as prognostic markers in patients with alcoholic liver disease. J Hepatol. 2003;39(2):179–86.
273 Brunt PW, Kew MC, Scheuer PJ, Sherlock S. Studies in alcoholic liver disease in Britain. I. Clinical and pathological patterns related to natural history. Gut. 1974;15(1):52–8.
274. Rosen HR, Golden-Mason L, Daly AK, Yang I, Day CP. Variants in the LGALS9 gene are associated with development of liver disease in heavy consumers of alcohol. Clin Gastroenterol Hepatol. 2016;14(5):762-768 e761.
275. Becker U, Andersen J, Poulsen HS, Horn T. Variation in hepatic estrogen receptor concentrations in patients with liver disease. A multivariate analysis. Scand J Gastroenterol. 1992;27(5):355–61.
276. Quintero-Platt G, Gonzalez-Reimers E, Martin-Gonzalez MC, Jorge-Ripper C, Hernandez-Luis R, Abreu-Gonzalez P, Rodriguez-Gaspar M, Santolaria-Fernandez F. Vitamin D, vascular calcification and mortality among alcoholics. Alcohol Alcohol. 2015;50(1):18–23.
277. Kemo F, Shengying X, Gengsong M, Aihong M. jianhua G, shifeng C: Investigation and Analysis of TCM Syndrome Distribution in 200 cases of alcoholic liver Disease. Chin J Integr Tradit West Med Liver Dis. 2019;29(02):133–6.
278. Guangfu G, Shufeng Z, Changwu W, Hongwei G. Clinical characteristics of 206 patients with alcoholic liver disease. J Clin Hepatol. 2017;33(09):1766–8.
279. Shuang S. Analysis of clinical features of 537 patients with alcoholic liver diseases. Master. Jilin University; 2018.
280. Simin Y. Clinical diagnosis and treatment of 71 cases of alcoholic liver disease. Chin J Mod Drug Appl. 2014;8(22):122–3.
281. Siqin S, Li C, Fuyang B. The application value of B ultrasound in the diagnosis of alcoholic liver disease. Chin J Ultrasound Diagn. 2005;06(07):531–2.
282. Yiguang X, Jian L, Yuanyuan H. Clinical application of CG and HA in alcoholic liver disease. J Radioimmunology. 2000;02:107.
283. Hongbo Y. Maddrey's discriminant function and evaluation of prognosis in alcoholic liver disease. China Mod Med. 2012;19(16):38–9.
284. Chunjie L, Huaying X. Diagnostic value of color Doppler ultrasound in alcoholic liver disease. J Mod Med Health. 2012;28(10):1545–6.
285. Yuhua P, Jinhuan W, Ruihua D, Guanglan P. Application of color Doppler ultrasound in the diagnosis of alcoholic liver disease. Qinghai Med J. 2017;47(11):62–3.
286. Zhifang G, Qian L. Clinical value and curative effect of ultrasonography in diagnosis of fatty liver and alcoholic liver. Seek Med. 2011;9(10):97.
287. Xiuzhen W, Ju Z. Influence of telephone follow-up on compliance behavior of patients with alcoholic liver disease after discharge. Contemp Nurse. 2012;11:120–1.
288. Wei Z. Effect of continuous nursing care on patients with alcoholic liver disease. Contemp Med Forum. 2017;15(15):226–7.
289. Kang C. Effect of polyene phosphatidylcholine combined with reduced glutathione on liver function in patients with alcoholic liver disease. J China Prescription Drug. 2019;17(11):80–1.
290. Xiufang Y, Qianfeng M, Jianjun W, Miao L. The study on haemodynamic changes of entering liver alcoholic liver disease. Ningxia Med J. 2008;30(11):974–6.
291. Jianming W. Effect of reduced Glutathione combined with Salvia miltiorrhiza injection on liver fibrosis in patients with alcoholic liver disease. Mod Diagn Treat. 2019;30(04):608–10.
292. Zhili C, Wenshuang Z, Wei W, Yan W. Effect of reduced glutathione combined with polyene phosphatidylcholine on indicators of liver function and liver fibrosis in the treatment of patients with alcoholic liver disease. Guangxi Med J. 2017;39(03):334–6.
293. Huijuan L, Hong G. Analysis of several biochemical indexes for early diagnosis of alcoholic liver disease. Jiangxi J Med Lab Sci. 2001;19(05):291.
294. Jun S, Caixian L, Jie Z, Hao T, Chunxing Z, Shouhua Z. Clinical analysis of 105 cases of alcoholic liver diseases. J Pract Med. 2007;23(05):704–5.
295. Hua H, Chengshan S. Clinical analysis of 140 cases of alcoholic liver diseases. Chin Commun Phys. 2007;9(04):15.
296. Chuanfeng L, Yongcan H, Xiang Q, Yunfeng P. Clinical analysis of 146 cases of alcoholic liver diseases. J Clin Hepatol. 2004;20(03):157–8.
297. Lixia W, Gang Z, Zhijun D. Clinical analysis of 218 patients with alcoholic liver disease. J Clin Hepatol. 2012;28(01):44–7.
298. Qiuli F. Ultrasonic image analysis of 52 patients with alcoholic liver disease. J Clin Ration Drug Use. 2012;5(16):60.
299. Junlin L. Clinical diagnosis and treatment of 68 cases of alcoholic liver disease. Chin Med Mod Distance Educ China. 2011;9(02):198–9.
300. Baona G, Yutao Z. clinical features of alcoholic liver diseases: an analysis of 79 cases. J Pract Hepatol. 2018;21(06):877–80.
301. Chunling J. Investigation and countermeasure of health education demand in 80 cases of alcoholic liver disease. J Qilu Nurs. 2008;15:83.
302. Suhong Y. Ultrasonic image analysis of alcoholic liver disease. Clin Med. 2005;25(08):53–4.
303. Fenghua X. Etiology and clinical nursing intervention of alcoholic liver disease. Med Forum. 2012;16(24):3157–8.
304. Yankun S, Yang W, Peng L. Ultrasonographic diagnosis of alcoholic liver disease. Med Inform. 2011;24(04):2461–2.
305. Qiong'ai J. Diagnostic value of ultrasonography in alcoholic liver disease. China Pract Med. 2008;19:76.
306. Huijun C. Alcoholic liver disease a retrospective analysis. Master. Guangzhou University of Traditional Chinese Medicine; 2009.
307. Hongyang W, Lihong S, Hongxia L. Clinical analysis of alcoholic liver disease. China Foreign Med Treat. 2009;28(21):50.
308. Jiangjing L, Yang J, Hongping Z. Epidemiological investigation of alcoholic liver disease. J Mod Med Health. 2010;26(10):1590–1.
309. Jihong M, Juhua P. Analysis of risk factors and nursing countermeasures of alcoholic liver disease. Chin Commun Doctors. 2008;10(16):161.
310. Youyi S. Investigation on plasma homocysteine and folate levels in alcoholic liver disease. Lab Med Clin. 2011;8(03):303–4.
311. Chunyan R. Clinical nursing experience of inpatients with alcoholic liver disease. J Med Inform. 2011;24(04):1473.
312. Juan Z, Xinming C, Guifang D. A brief analysis of the clinical features of alcoholic liver disease. Seek Med. 2012;10(07):33+875.
313. Baorong C. A multicenter study of alcoholic liver disease in China. Chin J Digest. 2007;27(04):231–4.
314. Ruibao J, Jibin T, Jiali Z, Xiaoling C, Yun S, Huifeng C. Effects of four types of alcoholic liver diseases on hepatic associated blood indicators. Med Sci J Cent South China. 2019;47(03):255–9.
315. Maocong Y, Yang L, Li X, Xiuzhen Y, Hui Z, Bian W. Characteristics of laboratory tests in 273 patients with alcoholic liver disease in Taizhou. Chin Hepatol. 2018;23(02):133–5+187.
316. Juan G, Ruiyun Z, Jinyuan X. To explore the significance of changes of Thyroid hormone in alcoholic liver disease. Clin Med. 2003;23(02):38–9.
317. Qide Z. Epidemiological investigation and influencing factors of alcoholic liver disease in outpatient department of digestive medicine. Renowned Doctor. 2018;2018(09):94.
318. Changchun Z, Yujun C, Yao H. Analysis of risk factors for alcoholic liver disease prognosis. Chin J Gastroenterol Hepatol. 2013;22(01):34–7.
319. Guihua P, Yunv J, Yingyu X. A new method for diagnosis of alcoholic liver disease: mitochondrial isozyme of serum aspartate aminotransferase. Med J Chin People's Health. 2012;24(03):304–5.
320. Zhengsheng Z, Jun Z, Xiaoxia W, Ang H, Ying S, Binxia C. Analysis of clinical features of in patients with alcoholic liver diseases. J Pract Hepatol. 2014;17(01):26–9.
321. Hagstrom H, Thiele M, Simon TG, Sharma R, Rockert Tjernberg A, Roelstraete B, Soderling J, Ludvigsson JF. Risk of infections and their role on subsequent mortality in biopsy-proven alcohol-related liver disease. United European Gastroenterol J. 2022;10(2):198–211.
322. Altamirano J, Miquel R, Katoonizadeh A, Abraldes JG, Duarte-Rojo A, Louvet A, Augustin S, Mookerjee RP, Michelena J, Smyrk TC, et al.

A histologic scoring system for prognosis of patients with alcoholic hepatitis. Gastroenterology. 2014;146(5):1231-1239.e1236.
323. Abe H, Aida Y, Seki N, Sugita T, Tomita Y, Nagano T, Itagaki M, Sutoh S, Nagatsuma K, Itoh K, et al. Aldehyde dehydrogenase 2 polymorphism for development to hepatocellular carcinoma in East Asian alcoholic liver cirrhosis. J Gastroenterol Hepatol. 2015;30(9):1376–83.
324. Al-Azzawi Y, Albo B, Fasullo M, Coukos J, Watts GJ, Tai R, Radcliffe D, Kroll-Desrosiers A, Devuni D, Szabo G. Sarcopenia is associated with longer hospital stay and multiorgan dysfunction in alcoholic hepatitis. Eur J Gastroenterol Hepatol. 2020;32(6):733–8.
325. Altamirano J, Higuera-de la Tijera F, Duarte-Rojo A, Martinez-Vazquez MA, Abraldes JG, Herrera-Jimenez LE, Michelena J, Zapata L, Perez-Hernandez J, Torre A, et al. The amount of alcohol consumption negatively impacts short-term mortality in Mexican patients with alcoholic hepatitis. Am J Gastroenterol. 2011;106(8):1472–80.
326. Alvarez MA, Cirera I, Solà R, Bargalló A, Morillas RM, Planas R. Long-term clinical course of decompensated alcoholic cirrhosis: a prospective study of 165 patients. J Clin Gastroenterol. 2011;45(10):906–11.
327. Atkinson SR, Grove JI, Liebig S, Astbury S, Vergis N, Goldin R, Quaglia A, Bantel H, Guha IN, Thursz MR, et al. In severe alcoholic hepatitis, serum keratin-18 fragments are diagnostic, prognostic, and theragnostic biomarkers. Am J Gastroenterol. 2020;115(11):1857–68.
328. Beck JI, Staicu A, Everett SM, Jackson P. Alcoholic liver disease on the intensive care unit - Outcomes and prognostication. J Intensive Care Soc. 2017;18(1):24–9.
329. Božin T, Rob Z, Lucijanić M, Čmarec Buhin L, Grgurević I. Comparison of prognostic scores for alcoholic hepatitis: a retrospective study. Croat Med J. 2021;62(1):17–24.
330. Campollo O, Martinez MD, Valencia JJ, Segura-Ortega J. Drinking patterns and beverage preferences of liver cirrhosis patients in Mexico. Subst Use Misuse. 2001;36(3):387–98.
331. Caregaro L, Alberino F, Amodio P, Merkel C, Bolognesi M, Angeli P, Gatta A. Malnutrition in alcoholic and virus-related cirrhosis. Am J Clin Nutr. 1996;63(4):602–9.
332. Charni F, Sutton A, Rufat P, Laguillier C, Mansouri A, Moreau R, Ganne-Carrie N, Trinchet JC, Beaugrand M, Charnaux N, et al. Chemokine RANTES promoter dimorphisms and hepatocellular carcinoma occurrence in patients with alcoholic or hepatitis C virus-related cirrhosis. Cancer Epidemiol Biomarkers Prev. 2011;20(7):1439–46.
333. Daswani R, Kumar A, Anikhindi SA, Sharma P, Singla V, Bansal N, Arora A. Predictors of 90-day mortality in patients with severe alcoholic hepatitis: experience with 183 patients at a tertiary care center from India. Indian J Gastroenterol. 2018;37(2):141–52.
334. Deleuran T, Vilstrup H, Jepsen P. Decreasing mortality among Danish alcoholic cirrhosis patients: a nationwide cohort study. Am J Gastroenterol. 2016;111(6):817–22.
335. Deltenre P, Rufat P, Hillaire S, Elman A, Moreau R, Valla D, Lebrec D. Lack of prognostic usefulness of hepatic venous pressures and hemodynamic values in a select group of patients with severe alcoholic cirrhosis. Am J Gastroenterol. 2002;97(5):1187–90.
336. Ganne-Carrie N, Christidis C, Chastang C, Ziol M, Chapel F, Imbert-Bismut F, Trinchet JC, Guettier C, Beaugrand M. Liver iron is predictive of death in alcoholic cirrhosis: a multivariate study of 229 consecutive patients with alcoholic and/or hepatitis C virus cirrhosis: a prospective follow up study. Gut. 2000;46(2):277–82.
337. Garg SK, Sarvepalli S, Singh D, Obaitan I, Peeraphatdit T, Jophlin L, Asrani SK, Shah VH, Leise MD. Incidence and risk factors associated with 30-day readmission for alcoholic hepatitis. J Clin Gastroenterol. 2019;53(10):759–64.
338. Hietanen S, Herajarvi J, Lehtonen A, Lahtinen S, Liisanantti J. Treatment profile and long-term outcome of intensive care unit-admitted patients with liver cirrhosis or other liver disease in relation to alcohol consumption. Scand J Gastroenterol. 2021;56(2):180–7.
339 Jepsen P, Ott P, Andersen PK, Sorensen HT, Vilstrup H. Risk for hepatocellular carcinoma in patients with alcoholic cirrhosis: a Danish nationwide cohort study. Ann Intern Med. 2012;156(12):841–7, W295.
340. Kalaitzakis E, Wallskog J, Bjornsson E. Abstinence in patients with alcoholic liver cirrhosis: a follow-up study. Hepatol Res. 2008;38(9):869–76.
341. Kallis C, Dixon P, Silberberg B, Affarah L, Shawihdi M, Grainger R, Prospero N, Pearson M, Marson A, Ramakrishnan S, et al. Reducing variation in hospital mortality for alcohol-related liver disease in North West England. Aliment Pharmacol Ther. 2020;52(1):182–95.
342. Kasztelan-Szczerbińska B, Surdacka A, Celiński K, Roliński J, Zwolak A, Miącz S, Szczerbiński M. Prognostic significance of the systemic inflammatory and immune balance in alcoholic liver disease with a focus on gender-related differences. PLoS One. 2015;10(6):1–19.
343. Kim SH, Kim BG, Kim W, Oh S, Kim HY, Jung YJ, Jeong JB, Kim JW, Lee KL. Characterization of gastrointestinal hemorrhage and prediction of mortality in Asian patients with alcoholic hepatitis. J Gastroenterol Hepatol. 2016;31(4):814–21.
344. Kulkarni K, Tran T, Medrano M, Yoffe B, Goodgame R. The role of the discriminant factor in the assessment and treatment of alcoholic hepatitis. J Clin Gastroenterol. 2004;38(5):453–9.
345. Lackner C, Spindelboeck W, Haybaeck J, Douschan P, Rainer F, Terracciano L, Haas J, Berghold A, Bataller R, Stauber RE. Histological parameters and alcohol abstinence determine long-term prognosis in patients with alcoholic liver disease. J Hepatol. 2017;66(3):610–8.
346. Lin SY, Lin CL, Chen WS, Lin CC, Lin CH, Hsu WH, Hsu CY, Kao CH. Association between alcoholic cirrhosis and hemorrhagic stroke: a nationwide population-based study. Alcohol Alcohol. 2019;54(3):302–9.
347. Orrego H, Israel Y, Blake JE, Medline A. Assessment of prognostic factors in alcoholic liver disease: toward a global quantitative expression of severity. Hepatology (Baltimore, MD). 1983;3(6):896–905.
348. Pang JX, Ross E, Borman MA, Zimmer S, Kaplan GG, Heitman SJ, Swain MG, Burak K, Quan H, Myers RP. Risk factors for mortality in patients with alcoholic hepatitis and assessment of prognostic models: a population-based study. Can J Gastroenterol Hepatol. 2015;29(3):131–8.
349. Parker R, Im G, Jones F, Hernández OP, Nahas J, Kumar A, Wheatley D, Sinha A, Gonzalez-Reimers E, Sanchez-Pérez M, et al. Clinical and microbiological features of infection in alcoholic hepatitis: an international cohort study. J Gastroenterol. 2017;52(11):1192–200.
350. Peeraphatdit TB, Kamath PS, Karpyak VM, Davis B, Desai V, Liangpunsakul S, Sanyal A, Chalasani N, Shah VH, Simonetto DA. Alcohol rehabilitation within 30 days of hospital discharge is associated with reduced readmission, relapse, and death in patients with alcoholic hepatitis. Clin Gastroenterol Hepatol. 2020;18(2):477-485 e475.
351. Prystupa A, Sak J, Kicinski P, Stenzel-Bembenek A, Blazewicz A. Serum concentration of fluoride in patients with alcoholic liver cirrhosis from the Lublin Region in Eastern Poland. Int J Environ Res Public Health. 2021;18(3):1–9.
352. Prystupa A, Blazewicz A, Kicinski P, Sak JJ, Niedzialek J, Zaluska W. Serum concentrations of selected heavy metals in patients with alcoholic liver cirrhosis from the Lublin Region in Eastern Poland. Int J Environ Res Public Health. 2016;13(6):1–11.
353. Rosa H, Silverio AO, Perini RF, Arruda CB. Bacterial infection in cirrhotic patients and its relationship with alcohol. Am J Gastroenterol. 2000;95(5):1290–3.
354. Sakamaki A, Yokoyama K, Koyama K, Morita S, Abe H, Kamimura K, Takamura M, Terai S. Obesity and accumulation of subcutaneous adipose tissue are poor prognostic factors in patients with alcoholic liver cirrhosis. PLoS One. 2020;15(11):1–12.
355. Sandahl TD, Støy SH, Laursen TL, Rødgaard-Hansen S, Møller HJ, Møller S, Vilstrup H, Grønbæk H. The soluble mannose receptor (sMR) is elevated in alcoholic liver disease and associated with disease severity, portal hypertension, and mortality in cirrhosis patients. PLoS One. 2017;12(12):1–14.
356. Santos S, Mattos AA, Guimaraes MM, Boger BS, Coral GP. Alcohol consumption influences clinical outcome in patients admitted to a referral center for liver disease. Ann Hepatol. 2018;17(3):470–5.
357. Sargenti K, Prytz H, Nilsson E, Bertilsson S, Kalaitzakis E. Bacterial infections in alcoholic and nonalcoholic liver cirrhosis. Eur J Gastroenterol Hepatol. 2015;27(9):1080–6.
358. Shin S, Lee SH, Lee M, Kim JH, Lee W, Lee HW, Park MS, Park S, Kim TS, Choi DH. Aspirin and the risk of hepatocellular carcinoma development in patients with alcoholic cirrhosis. Medicine. 2020;99(9):1–7.
359. Sola R, Alvarez MA, Balleste B, Montoliu S, Rivera M, Miquel M, Cirera I, Morillas RM, Coll S, Planas R. Probability of liver cancer and survival in HCV-related or alcoholic-decompensated cirrhosis. A study of 377 patients. Liver Int. 2006;26(1):62–72.
360. Toshikuni N, Izumi A, Nishino K, Inada N, Sakanoue R, Yamato R, Suehiro M, Kawanaka M, Yamada G. Comparison of outcomes between patients

with alcoholic cirrhosis and those with hepatitis C virus-related cirrhosis. J Gastroenterol Hepatol. 2009;24(7):1276–83.
361. Whitfield JB, Masson S, Liangpunsakul S, Hyman J, Mueller S, Aithal G, Eyer F, Gleeson D, Thompson A, Stickel F, et al. Evaluation of laboratory tests for cirrhosis and for alcohol use, in the context of alcoholic cirrhosis. Alcohol. 2018;66(05):1–7.
362. Wiegand J, Kuhne M, Pradat P, Mossner J, Trepo C, Tillmann HL. Different patterns of decompensation in patients with alcoholic vs. non-alcoholic liver cirrhosis. Aliment Pharmacol Ther. 2012;35(12):1443–50.
363. Yang TW, Wang CC, Tsai MC, Wang YT, Tseng MH, Lin CC. Comorbidities and outcome of alcoholic and non-alcoholic liver cirrhosis in Taiwan: a population-based study. Int J Environ Res Public Health. 2020;17(8):1–10.
364. Yoon EL, Kim TY, Song DS, Kim HY, Kim CW, Jung YK, Sinn DH, Jang JY, Kim MY, Jeong SW, et al. The impact of previous acute decompensation on the long-term prognosis of alcoholic hepatitis in cirrhotic patients. J Clin Med. 2019;8(10):1–13.
365. Zekanovic D, Ljubicic N, Boban M, Nikolic M, Delic-Brkljacic D, Gacina P, Klarin I, Turcinov J. Doppler ultrasound of hepatic and system hemodynamics in patients with alcoholic liver cirrhosis. Dig Dis Sci. 2010;55(2):458–66.
366. Bin D. Nursing experience of 70 patients with alcoholic liver disease. Chin Commun Doctors. 2013;15(10):334–5.
367. Wanshu L, Qinghui Z, Fangjiao S, Bing Z, Shaojie X, Hong Z, Shaoli Y. Effect of nutritional intervention on prognosis of patients with severe alcoholic liver disease. Chin J Liver Dis. 2018;10(03):61–5.
368. Yang L, Baorong C. Clinical analysis on 237 cases with alcoholic liver cirrhosis. Jilin Med J. 2004;25(04):40–2.
369. Lizhen S. Clinical analysis of 58 cases of alcoholic liver disease. China Med Herald. 2010;7(17):157–8.
370. Xingguang S. Clinical analysis of 72 cases of alcoholic cirrhosis. Clin Med Shanxi Province. 2001;10(08):594.
371. Jiping Z, Tian G. Clinical analysis of 158 cases of alcoholic cirrhosis. Med Forum. 2005;09(06):566–7.
372. Ke Z. Clinical analysis of 272 cases of alcoholic liver diseases. Master. Nanchang University; 2007.
373. Ray G, Manjubhargav P. Clinical presentation and mortality determinants of alcohol-related liver disease: a single-center experience of the rising menace from Eastern India. Inflamm Intest Dis. 2019;4(3):104–14.
374. Sahlman P, Nissinen M, Pukkala E, Färkkilä M. Incidence, survival and cause-specific mortality in alcoholic liver disease: a population-based cohort study. Scand J Gastroenterol. 2016;51(8):961–6.
375. Dunn W, Jamil LH, Brown LS, Wiesner RH, Kim WR, Menon KV, Malinchoc M, Kamath PS, Shah V. MELD accurately predicts mortality in patients with alcoholic hepatitis. Hepatology (Baltimore, MD). 2005;41(2):353–8.
376. Israelsen M, Juel HB, Detlefsen S, Madsen BS, Rasmussen DN, Larsen TR, Kjaergaard M, Fernandes Jensen MJ, Stender S, Hansen T, et al. Metabolic and genetic risk factors are the strongest predictors of severity of alcohol-related liver fibrosis. Clin Gastroenterol Hepatol. 2022;20(8):1784-1794 e1789.
377. Peregud DI, Baronets VY, Lobacheva AS, Ivanov AS, Arisheva OS, Garmash IV, Kobalava ZD, Pirozhkov SV, Terebilina NN. PNPLA3 rs738409 associates with alcoholic liver cirrhosis but not with serum levels of IL6, IL10, IL8 or CCL2 in the Russian population. Ann Hepatol. 2021;20(05):100247–54.
378. Nault J-C, Guyot E, Laguillier C, Chevret S, Ganne-Carrie N, N'Kontchou G, Beaugrand M, Seror O, Trinchet J-C, Coelho J, et al. Serum proteoglycans as prognostic biomarkers of hepatocellular carcinoma in patients with alcoholic cirrhosis. Cancer Epidemiol Biomark Prev. 2013;22(8):1343–52.
379. Huang YS, Wang LY, Chang CH, Perng CL, Lin HC. Superoxide dismutase 2 genetic variation as a susceptibility risk factor for alcoholic cirrhosis. Alcohol Alcohol. 2016;51(6):633–7.
380. Bouttell J, Lewsey J, Geue C, Antony G, Briggs A, McCartney G, Hutchinson S, Graham L, Heydtmann M. The SCottish alcoholic liver disease evaluation: a population-level matched cohort study of hospital-based costs, 1991–2011. PLoS One. 2016;11(10):1–15.
381. Deleuran T, Schmidt M, Vilstrup H, Jepsen P. Time-dependent incidence and risk for myocardial infarction in patients with alcoholic cirrhosis. Eur J Clin Invest. 2020;50(4):1–7.
382. Thompson JA, Martinson N, Martinson M. Mortality and costs associated with alcoholic hepatitis: a claims analysis of a commercially insured population. Alcohol. 2018;71(04):57–63.
383. Guanting L. Preliminary analysis for clinical research (SCALE) of hierarchical diagnosis for chronic alcoholic liver disease based on organ damage: a multicenter prospective observational trial. Master. Southern Medical University; 2019.
384. Askgaard G, Grønbæk M, Kjær MS, Tjønneland A, Tolstrup JS. Alcohol drinking pattern and risk of alcoholic liver cirrhosis: a prospective cohort study. J Hepatol. 2015;62(5):1061–7.
385. Sandahl TD, Jepsen P, Thomsen KL, Vilstrup H. Incidence and mortality of alcoholic hepatitis in Denmark 1999–2008: a nationwide population based cohort study. J Hepatol. 2011;54(4):760–4.
386. Bergman BP, Mackay DF, Pell JP. Long-term consequences of alcohol misuse in Scottish military veterans. Occup Environ Med. 2015;72(1):28–32.
387. Askgaard G, Fleming KM, Crooks C, Kraglund F, Jensen CB, West J, Jepsen P. Socioeconomic inequalities in the incidence of alcohol-related liver disease: a nationwide Danish study. Lancet Reg Health Eur. 2021;08(09):1–9.
388 Bang UC, Benfield T, Bendtsen F. Reduced risk of decompensation and death associated with use of statins in patients with alcoholic cirrhosis. A nationwide case-cohort study. Aliment Pharmacol Ther. 2017;46(7):673–80.
389. Currie C, Davies A, Ariti C, Bardsley M. The impact of alcohol care teams on emergency secondary care use following a diagnosis of alcoholic liver disease - a national cohort study. BMC Public Health. 2016;16(05):685.
390. Dubois M, Sciarra A, Trepo E, Marot A, Saldarriaga J, Moreno C, Sempoux C, Deltenre P. Histologic parameter score does not predict short-term survival in severe alcoholic hepatitis. United European Gastroenterol J. 2020;8(9):1003–12.
391. Heydtmann M, McDonald SA. Survival and re-admission of patients admitted with alcoholic liver disease to a West of Scotland hospital. Scott Med J. 2013;58(3):134–8.
392. Hubbell FA, Webb DW, Ofstein MR, Goldberg RS, Rucker L. Biochemical testing in patients with alcoholic liver disease. South Med J. 1989;82(3):318–20.
393. Lyra AC, de Almeida LMC, Mise YF, Cavalcante LN. Epidemiological profile of alcoholic liver disease hospital admissions in a Latin American country over a 10-year period. World J Hepatol. 2020;12(5):230–8.
394. Nøjgaard C, Johansen JS, Christensen E, Skovgaard LT, Price PA, Becker U. Serum levels of YKL-40 and PIIINP as prognostic markers in patients with alcoholic liver disease. J Hepatol. 2003;39(2):179–86.
395. Radisavljevic MM, Bjelakovic GB, Nagorni AV, Stojanovic MP, Radojkovicn MD, Jovic JZ, Ignjatovic AM, Radisavljevic MM, Simonovic MM. Predictors of mortality in long-term follow-up of patients with terminal alcoholic cirrhosis: is it time to accept remodeled scores? Med Princ Pract. 2017;26(2):169–75.
396. Sørensen HT, Thulstrup AM, Mellemkjar L, Jepsen P, Christensen E, Olsen JH, Vilstrup H. Long-term survival and cause-specific mortality in patients with cirrhosis of the liver: a nationwide cohort study in Denmark. J Clin Epidemiol. 2003;56(1):88–93.
397. Yuhuan L, Dongying Q. Etiological analysis and health education methods of 154 patients with alcoholic cirrhosis. In: National Medical Nursing Academic Exchange and symposium, the national cardiac internal and surgical specialist nursing conference: 2006; Haikou, Hainan, China. 2006. p. 466–8.
398. Yan Y. Clinical analysis of 72 cases of alcoholic hepatitis. J Med Forum. 2005;26(24):22–3.
399. Sen T, Qin Z. Clinical diagnosis and treatment of 211 cases of alcoholic liver disease. In: The 24th national conference on Integrated Traditional Chinese and western medicine for liver diseases: 2015; Shenyang, Liaoning, China. 2015. p. 114.
400. Guanxiang D. Clinical analysis of 82 cases of alcoholic liver diseases. Med Forum. 2007;11(22):966–7.
401. Orrego H, Blake JE, Blendis LM, Medline A. Prognosis of alcoholic cirrhosis in the presence and absence of alcoholic hepatitis. Gastroenterology. 1987;92(1):208–14.
402. Orntoft NW, Sandahl TD, Jepsen P, Vilstrup H. Short-term and long-term causes of death in patients with alcoholic hepatitis in Denmark. Clin Gastroenterol Hepatol. 2014;12(10):1739-1744.e1731.

403. Åberg F, Helenius-Hietala J, Puukka P, Färkkilä M, Jula A. Interaction between alcohol consumption and metabolic syndrome in predicting severe liver disease in the general population. Hepatology (Baltimore, MD). 2018;67(6):2141–9.
404. Noda K, Yoshihara H, Suzuki K, Yamada Y, Kasahara A, Hayashi N, Fusamoto H, Kamada T. Progression of type C chronic hepatitis to liver cirrhosis and hepatocellular carcinoma–its relationship to alcohol drinking and the age of transfusion. Alcohol Clin Exp Res. 1996;20(1 Suppl):95a–100a.
405. Serfaty L, Poujol-Robert A, Carbonell N, Chazouillères O, Poupon RE, Poupon R. Effect of the interaction between steatosis and alcohol intake on liver fibrosis progression in chronic hepatitis C. Am J Gastroenterol. 2002;97(7):1807–12.
406. Mellinger JL, Scott Winder G, DeJonckheere M, Fontana RJ, Volk ML, Lok ASF, Blow FC. Misconceptions, preferences and barriers to alcohol use disorder treatment in alcohol-related cirrhosis. J Subst Abuse Treat. 2018;2018(91):20–7.
407. Mendes BG, Schnabl B. From intestinal dysbiosis to alcohol-associated liver disease. Clin Mol Hepatol. 2020;26(4):595–605.
408. World health statistics 2022: monitoring health for the SDGs, sustainable development goals. https://www.who.int/publications/i/item/9789240051157.
409. Global status report on alcohol 2004. https://www.who.int/publications/i/item/global-status-report-on-alcohol-2004.
410. Zhou L, Conner KR, Caine ED, Xiao S, Xu L, Gong Y, Zhang R, Phillips MR. Epidemiology of alcohol use in rural men in two provinces of China. J Stud Alcohol Drugs. 2011;72(2):333–40.
411. Newman I, Qian L, Tamrakar N, Feng Y, Xu G. Composition of Unrecorded Distilled Alcohol (bai jiu) Produced in Small Rural Factories in Central China. Alcohol Clin Exp Res. 2017;41(1):207–15.
412. Xiao J, Wang F, Wong NK, Lv Y, Liu Y, Zhong J, Chen S, Li W, Koike K, Liu X, et al. Epidemiological realities of alcoholic liver disease: global burden, research trends, and therapeutic promise. Gene Expr. 2020;20(2):105–18.
413. Alavi M, Janjua NZ, Chong M, Grebely J, Aspinall EJ, Innes H, Valerio HM, Hajarizadeh B, Hayes PC, Krajden M, et al. The contribution of alcohol use disorder to decompensated cirrhosis among people with hepatitis C: an international study. J Hepatol. 2018;68(3):393–401.
414. Zakhari S, Gordis E. Moderate drinking and cardiovascular health. Proc Assoc Am Physicians. 1999;111(2):148–58.
415. Fernández-Solà J. Cardiovascular risks and benefits of moderate and heavy alcohol consumption. Nat Rev Cardiol. 2015;12(10):576–87.
416. Liu Z, Song C, Suo C, Fan H, Zhang T, Jin L, Chen X. Alcohol consumption and hepatocellular carcinoma: novel insights from a prospective cohort study and nonlinear Mendelian randomization analysis. BMC Med. 2022;20(1):413.
417. Crabb DW, Im GY, Szabo G, Mellinger JL, Lucey MR. Diagnosis and treatment of alcohol-associated liver diseases: 2019 practice guidance from the American Association for the study of liver diseases. Hepatology. 2020;71(1):306–33.

Publisher's Note