STROBE Statement—Checklist of items that should be included in reports of ***cohort studies***

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Retrospective Cohort Study (*b*) BACKGROUND: Primary sclerosing cholangitis (PSC) is associated worldwide with a broad phenotype spectrum in different populations from diverse ethnic and racial backgrounds and access to healthcare. AIMS: This study aims to describe the clinical features and outcomes of PSC in a liver transplant cohort from Northeast Brazil. METHODS: The study included all individuals submitted to liver transplant with a PSC diagnosis before or after liver transplant. Data from the liver transplant center were retrospectively reviewed to assess demographics and clinical features of PSC, as well as the outcomes, such as transplantation survival. Statistical analysis adopted a significance level of $p<0.05$. The Mann-Whitney U test was employed to analyze patient characteristics after verifying the data did not fit the Gaussian distribution. The chi-square test and Fisher's exact test were used to compare categorical variables. Kaplan-Meier survival analysis was performed to estimate the cumulative survival considering the 95% confidence interval. RESULTS: 1.6% patients received transplants due to PSC. 56% were male. 88% had classic PSC and 3 women overlap. Median time between onset of symptoms and diagnosis was 23 months. All patients were symptomatic at diagnosis. Inflammatory bowel disease (IBD) was frequent in 69% of cases, among which Ulcerative colitis was most common. Men had higher ALP base levels ($p=0.045$) and significantly more severe transplants ($p=0.011$). Liver Transplant indications were due to decompensated cirrhosis (84%), intractable pruritus (12%), and hepatocarcinoma (3.1%). Post-LT survival rates were 82% after 1 year and 71% after 5 years. As for LT complications, two patients needed transplants due to hepatic artery thrombosis and due to primary graft dysfunction. CONCLUSION: Survival after one and five years was similar to other LT indications. Findings of Cholangiocarcinoma survival rates indicate that this may be an indicator for LT in select cases.	
Introduction			
Background/rationale	2	Primary sclerosing cholangitis (PSC) is an autoimmune, chronic, progressive disease that causes inflation, stenosis and dilation of intra- and extrahepatic bile ducts1. Clinically, it is characterised mainly by fatigue and pruritus2. It may develop complications with recurrent cholangitis, cholangiocarcinoma and cirrhosis. Around 70% of patients display inflammatory bowel disease, mainly ulcerative colitis (UC), with elevated risk of colorectal cancer3. Currently available clinical treatments do not alter the natural history of PSC, and liver transplant (LT) is the only available curative treatment4. However, some studies describe disease relapse following transplant in 25% of cases5. Choosing the appropriate moment for a liver transplant indication isn't always easy. Intractable pruritus, recurrent cholangitis, hepatocarcinoma and decompensated cirrhosis are some of the classic indications for liver transplantation1.	

Objectives	3	The goal of this study is to analyse the clinical profile, complications and survival rate of patients who received liver transplants due to PSC at an indication service.	
Methods			
Study design	4	This is a retrospective, observational cohort.	
Setting	5	Data collection was carried out at the Hospital Universitário Walter Cantidio through an active search in medical records from January 2022 to December 2022. Follow-up time was defined as the duration of outpatient follow-up until the patient was included in the study or the date of death.	
Participants	6	All individuals submitted to liver transplant with a PSC diagnosis before or after liver transplant.	
Variables	7	Variables studied were age, sex, clinical manifestations, association with IBD and other comorbidities, time between PSC diagnosis and liver transplant, cause of transplant, PSC classification, laboratory tests, treatments and complications prior to LT, ischemia time, Child-Pugh and MELD scores, immunosuppression, PSC relapse following LT, rejection, and death.	
Data sources/ measurement	8*	PSC diagnosis was made through clinical and laboratory findings associated with compatible image findings from magnetic resonance cholangiopancreatography (MRCP) or endoscopic retrograde cholangiopancreatography (ERCP). Histopathological diagnosis of small duct PSC was considered when liver biopsy was performed prior to LT or in the explant biopsy. Small duct PSC diagnosis was defined by cholestasis associated with a compatible liver biopsy, in the absence of biliary stenosis on imaging examinations (ERCP or MRCP). Autoimmune hepatitis diagnosis was established through the International Autoimmune Hepatitis Group Score	
Bias	9	All patients were explored with no bias.	
Study size	10	The data were stored in an electronic spreadsheet to form the database and subsequently imported into the R® statistical program.	
Quantitative variables	11	Statistical analysis adopted a significance level of $p<0.05$. The Mann-Whitney U test was employed to analyse patient characteristics after verifying the data did not fit the Gaussian distribution. The chi-square test and Fisher's exact test were used to compare categorical variables. Kaplan-Meier survival analysis was performed to estimate the cumulative survival considering the 95% confidence interval.	
Statistical methods	12	The Mann-Whitney U The chi-square test and Fisher's exact test Kaplan-Meier survival	
Results			
Participants	13*	34 received transplants due to PSC. The entire eligible population was included.	
Descriptive data	14*	(a) This study had mostly males (n=19, 56%) and an average age of 40 years (± 14), which was similar between men, 38 (± 14), and women, 43 (±13) (p=0.347). Average time between onset of symptoms and PSC diagnosis was 23 months (ranging from 0 to 128). The follow-up time from	

		diagnosis to TF was 68 months (ranging from 0 to 196). As for the clinical form, most patients had classic CEP. Three women had PSC/AIH overlap syndrome. All patients were symptomatic at diagnosis. Inflammatory bowel disease was investigated by colonoscopy in only 26 out of 34 (76%) patients, and was present in a majority of cases (18/34, 69%). Alkaline phosphatase levels at diagnosis and pre-transplant MELD scores were significantly higher in males. The surgical techniques used to reconstruct bile ducts were end-to-end and Roux-en-Y hepaticojejunostomy in 65% and 35% of cases respectively. Cholangiocarcinoma was diagnosed in 2 out of 34 patients (5.9%) during histopathological examination of the explant. Overall median survival following LT was 66 months (ranging from 0 to 234) and similar between men and women (p=0.282). Three patients passed due to COVID-19 after 4, 6 and 10 years. Another patient passed due to infection 1 year and 7 months following LT, for a total of 10 deaths.The 1-year and 5-year survival rates of this cohort were 82.3% and 70.6% respectively, similar to the average overall survival rates of patients who received liver transplants in this institution, which were 87.1% and 69.43% respectively (p=0.83). (b) clinical manifestations(2), time between PSC diagnosis and liver transplant(3), laboratory tests(10), treatments and complications prior to LT(3), MELD scores (7), (c) The follow-up time until ST was 83 ± 51.3 and a median of 68 months. Follow-up time after LT was on average 83 (±70) with a median of 66 months.	
Outcome data	15*	Most deaths occurred in the first year, two due to infection, three due to primary graft dysfunction of the liver and one due to unknown causes.	
Main results	1	(*a*) The survival of this cohort was satisfactory and similar to the mean overall survival rates of patients who received liver transplants at this institution. The findings of cholangiocarcinoma in the explant had a satisfactory survival when compared to other literature.	
Other analyses	17	No analyzes other than those mentioned were performed.	
Discussion			
Key results Limitations Interpretation Generalisability		PSC represented only 1.6% of total transplant patients, less than in Nordic countries, where 15.3% of LTs occur due to this disease. The practically equal occurrence of TF in both sexes in this case selection also differs from the significant predominance in men described in the literature, where PSC occurs in a proportion of up to 2 men to 1 woman. The higher proportion of women with PSC has been previously described in a Brazilian multicenter study, in which 45% of patients were women8.	

Prevalence of classic PSC was similar to studies in Europe, North America and Australia. Overall average age was 33 years (ranging from 11 to 61), similar to Latin American results of 29 years (ranging from 19 to 40), but lower than in the United Kingdom, where average age at diagnosis was 54 years old (ranging from 6 to 93).

Time between onset of symptoms and PSC diagnosis in this selection of cases was almost twice that of a Swedish study, which diagnosed it, on average, in 16 months. Elevation of serum alkaline phosphatase and gamma-glutamyl transferase are typical in patients with primary sclerosing cholangitis, but we also found abnormalities in AspAT and ALT levels, which were on average 5 and 3 times greater than the normal value at the time of diagnosis11. Williamson and Chapman reported that serum bilirubin levels are usually normal at disease onset; however, they may fluctuate during the course of the disease12. In our findings, median bilirubin was 8.72mg/dl. The presence of several autoantibodies in the serum of a patient with PSC suggests autoimmunity plays a role in pathogenesis, but it is not useful for diagnosis due to low sensitivity and specificity13. In a review of PSC, it was found that p-ANCA, ANA and AMA have a prevalence of 50-80%, 7-77% and 13-20%14. Few patients in this case selection investigated these antibodies, with a low prevalence found.

Slightly more than half (52%) of patients used prednisone. Administering immunosuppressants for patients with PSC is rarely recommended and is only indicated in cases of overlap. As for time between PSC diagnosis and LT indication, a study in the Netherlands with 3020 patients demonstrated this was much larger than this case selection at 27 and 9.7 years respectively. In a wide-ranging review by Song et al, cholangiocarcinoma incidence risk is 10 to 1000 times higher in patients with PSC than the general population. Early diagnosis of cholangiocarcinoma in two patients agrees with the literature, in which CC appears one year after LT in 50% of cases.

Cholangiocarcinoma is a formal contraindication for liver transplantation in Brazil. In this selection of cases, despite the early disease recurrence presented by two patients, the survival of both was higher than that described in the literature, which describes an overall survival rate of intrahepatic cholangiocarcinoma of only 40.8% (39.8–41.9) and 9.8% (9–10.5) after 1 and 5 years respectively. This case selection's five-year survival rate was higher than that in the United Kingdom, where the post-LT survival rate of PSC was 75%.

Other information

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at http://www.strobe-statement.org.