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Gastroenterology and Hepatology

Title

Prognostic value of liver stiffness heterogeneity on staging fibrosis in patients with primary sclerosis cholangitis

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Data Availability

The data associated with this publication are not available for this reason: NA

OBJECTIVES

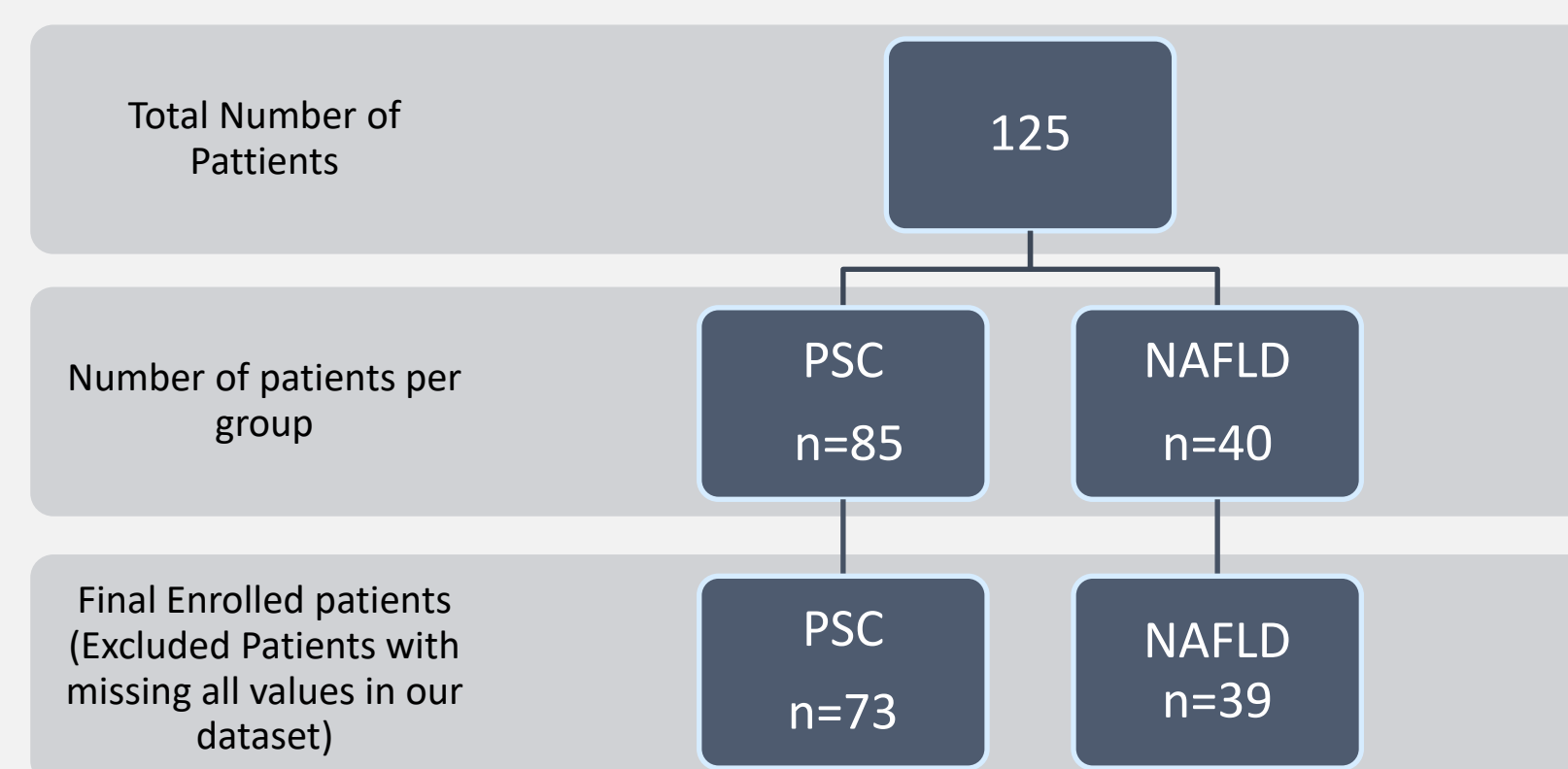
- Is liver stiffness by MRE more variable in patients with PSC compared to NASH
- Does liver stiffness variability increase with liver stiffness
- Does liver stiffness variability predict transplant-free survival
- Time-to-event analysis of transplant or death with liver stiffness, liver stiffness variability, total bilirubin, sex, albumin

BACKGROUND

- Primary sclerosing cholangitis (PSC) is a chronic cholestatic liver disease with a median transplant survival of ~20 years.¹
- PSC has been associated to be a heterogenous process in comparison to other chronic liver diseases².
- Several models have used MRI features I to provide prognostic outcomes for PSC.
- Kawamura et al., has demonstrated evidence of heterogeneity in the spatial severity of liver fibrosis as instrumental when there is a discordance between MRE-based staging and pathological staging in patients with NASH³.
- Comparison of liver stiffness variability via MRE in patients with PSC compared to NASH has yet to be studied systematically.

METHODS

- **Diagnosis of PSC including** Large/Small/Overlap (AIH) PSC: (diagnosed according to accepted criteria, including cholangiography (good quality MRCP, ERCP, PTC) compatible with PSC)
- **Diagnosis of NASH including** hepatic steatosis by imaging or biopsy
At least 1 MRE available for analysis
Minimum of 1 year of clinical follow up from index MRE
Liver stiffness heterogeneity was assessed via two methods:
Variability %: difference between max and minimum LS values / maximum value
Coefficient of variation in % = individual intrahepatic slice SD/ mean intrahepatic slice



RESULTS

Fibrosis Stage	NAFLD Heterogenous	PSC Heterogenous	P-Value
Normal	1	6	0.05
Normal or Inflammation	1	5	
Stage 1-2	0	2	
Stage 2-3	2	6	
Stage 3-4	0	6	
Stage 4	12	10	

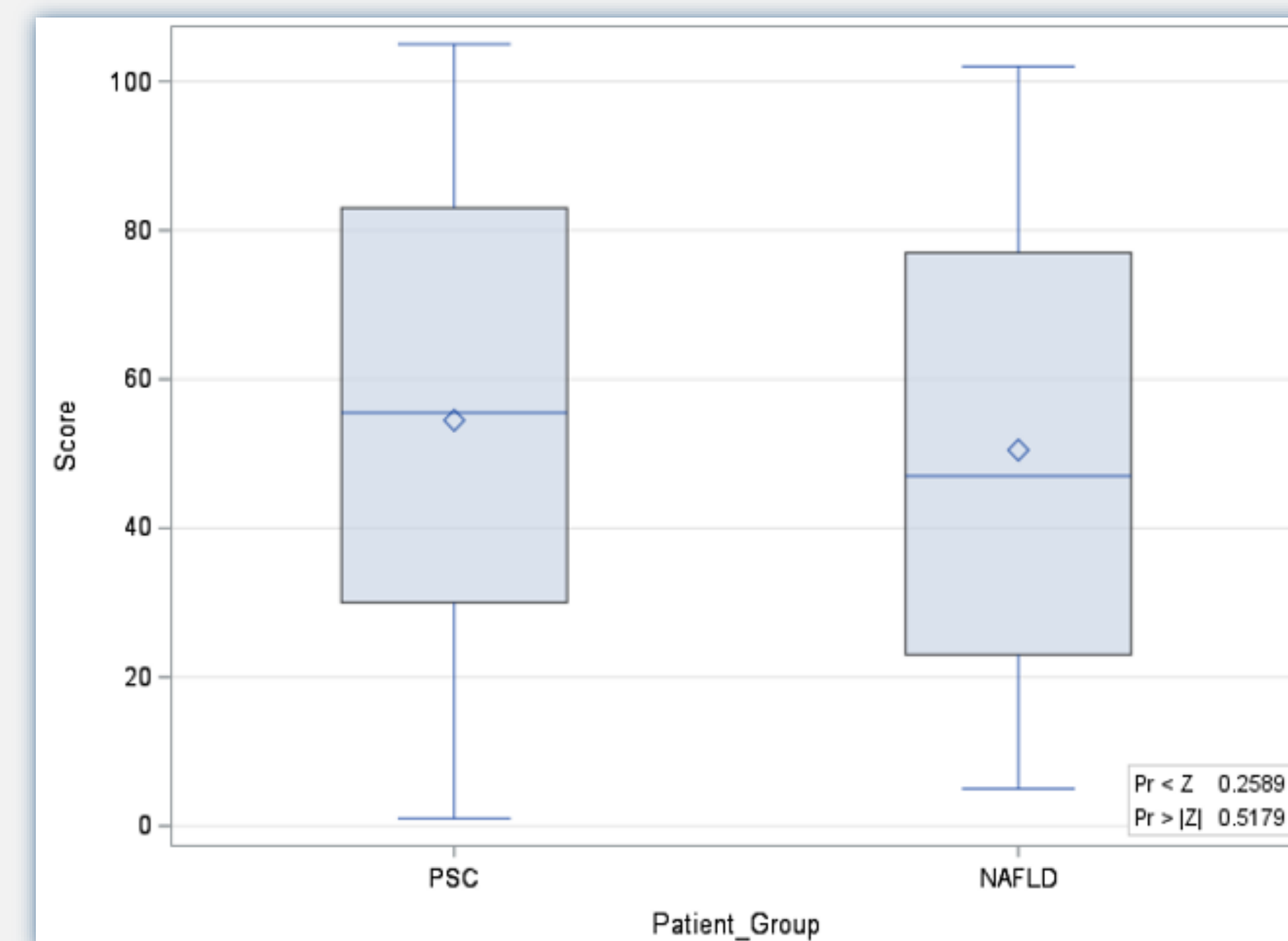


Figure 1. Liver stiffness variability in PSC vs NAFLD patients

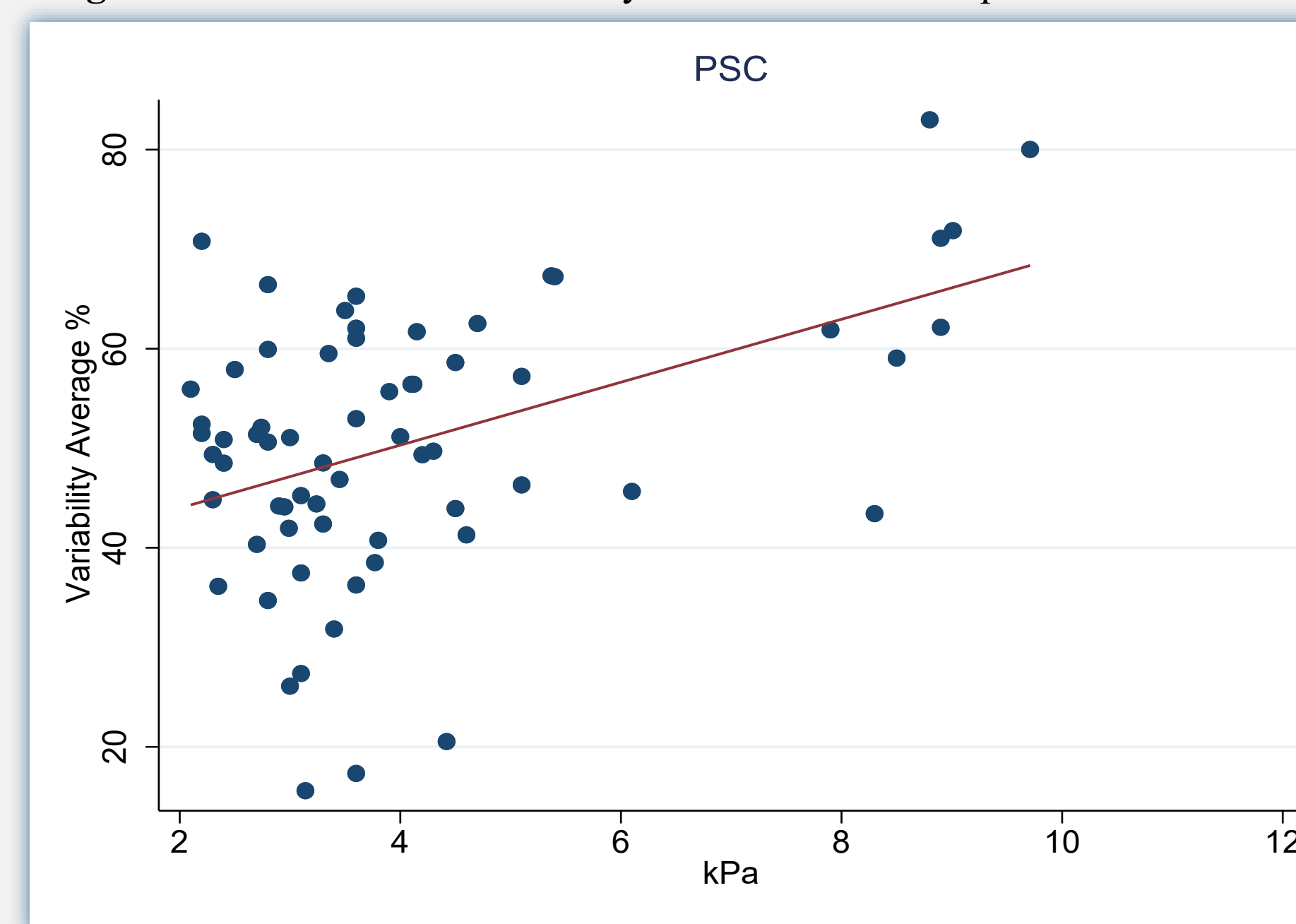
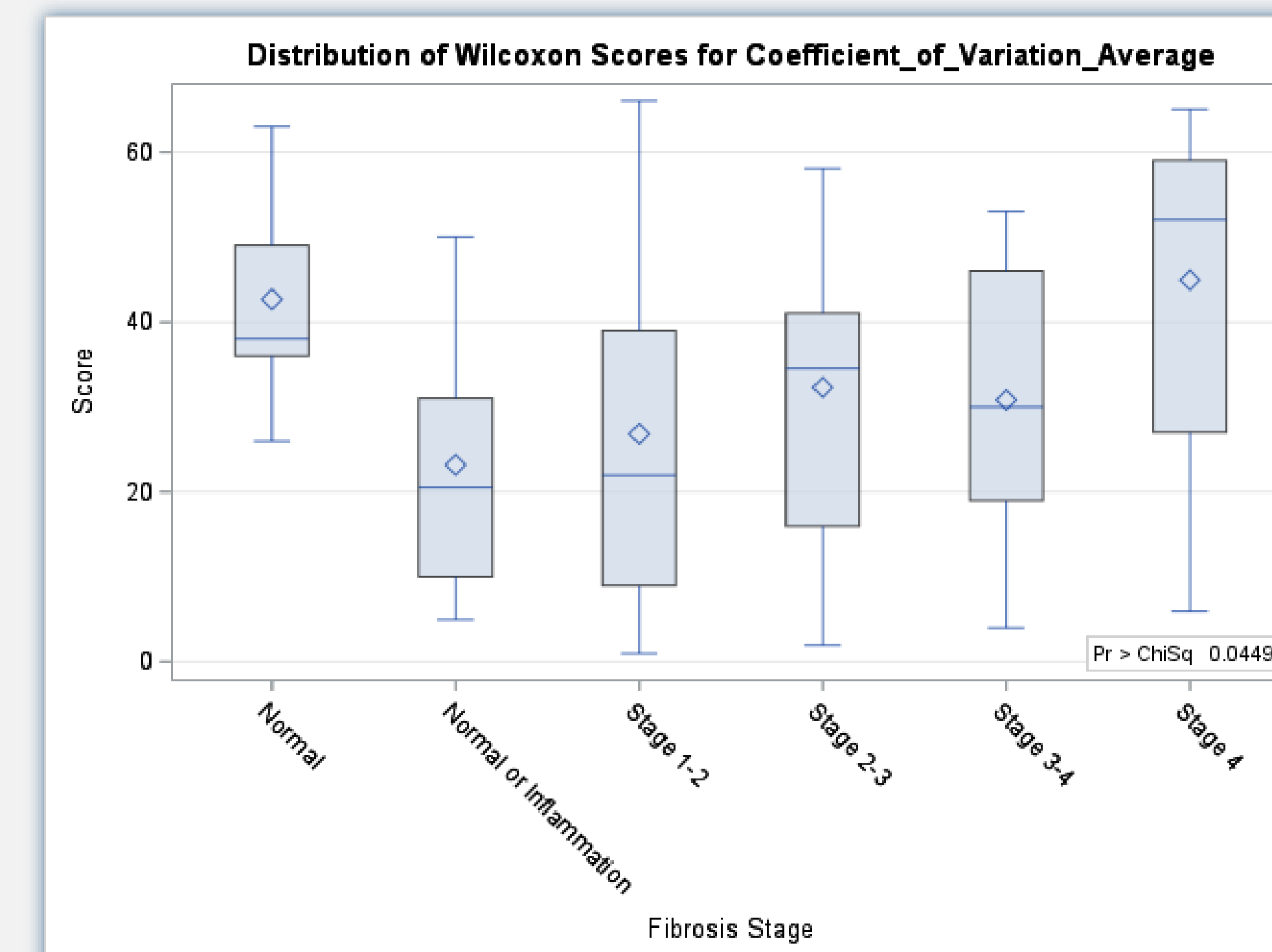


Figure 2. Correlation between kPa and variability % in PSC patients

PSC Patients



NAFLD Patients

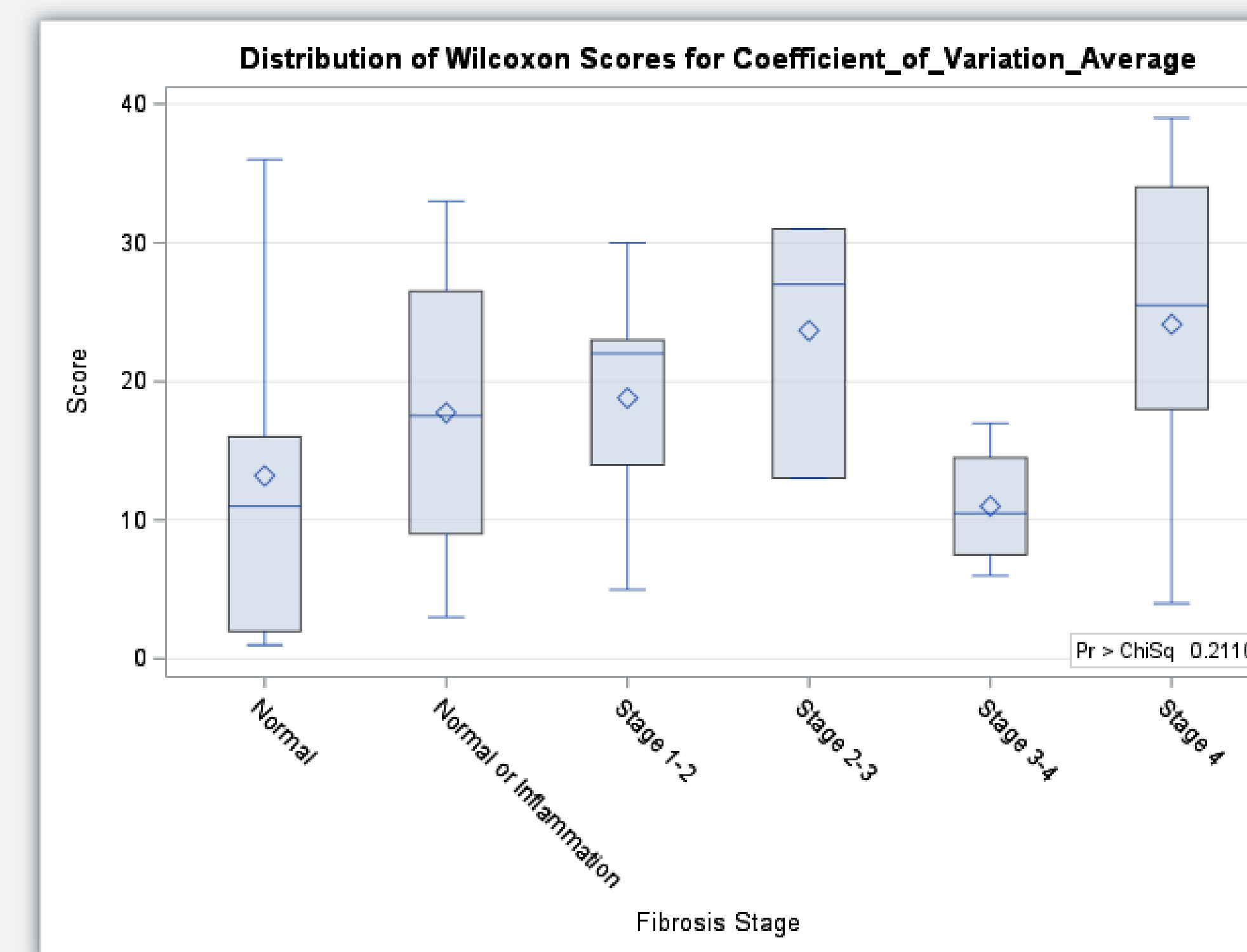


Figure 3 & 4. Comparison of Coefficient of Variation Avg by fibrosis stage in PSC vs NAFLD patients

PATIENT CHARACTERISTICS

Table 1. Clinical and biochemical characteristics

Characteristics	Overall (n=112)		P-Value
	PSC (n= 73)	NAFLD (n=39)	
Age (years)	45.0 (29.0-53.0)	61 (49.0-68.0)	
Sex, male	34 (47%)	12 (31%)	<.0001
Race			
White	27 (37%)	27 (69%)	0.009
Black or African	4 (5%)	-	
American	5 (7%)	2 (5%)	
Other	37 (51%)	10 (26%)	
Unknown/missing			
Fibrosis Stage			
Normal	9 (12%)	5 (13%)	0.118
Normal or Inflammation	13 (18%)	4 (10%)	
Stage 1-2	13 (18%)	5 (13%)	
Stage 2-3	11 (15%)	3 (8%)	
Stage 3-4	12 (16%)	4 (10%)	
Stage 4	15 (21%)	18 (46%)	

CONCLUSION

- MR Elastography provided accurate information about fibrosis stage for patients with PSC and patients with NAFLD
- MRE demonstrated increased heterogeneity in liver fibrosis in patients with PSC as fibrosis severity increased
- There was no difference in liver heterogeneity between different NAFLD fibrosis stages
- In our limited retrospective analysis, there is no difference in liver heterogeneity between patients with PSC and advanced NAFLD fibrosis

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