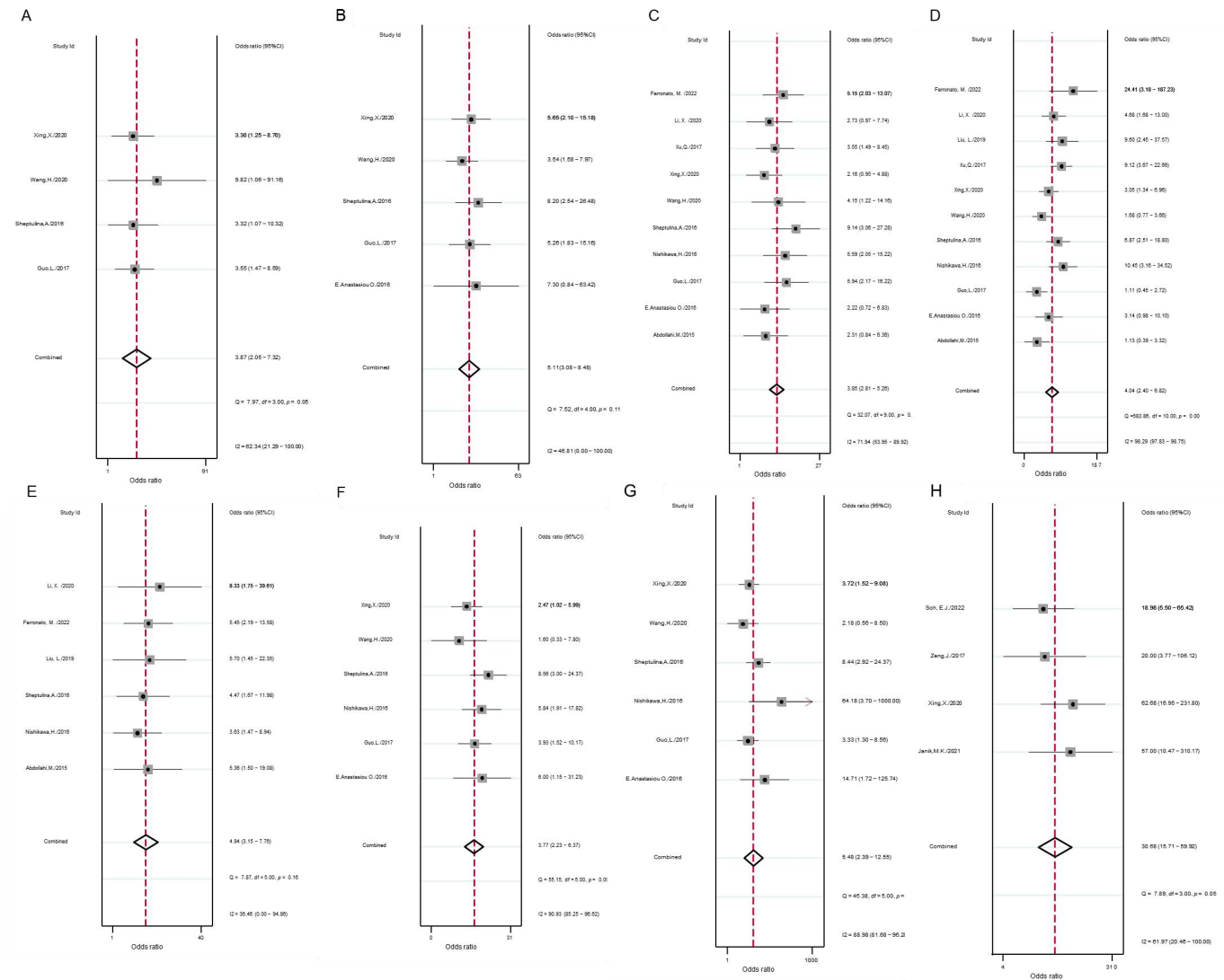


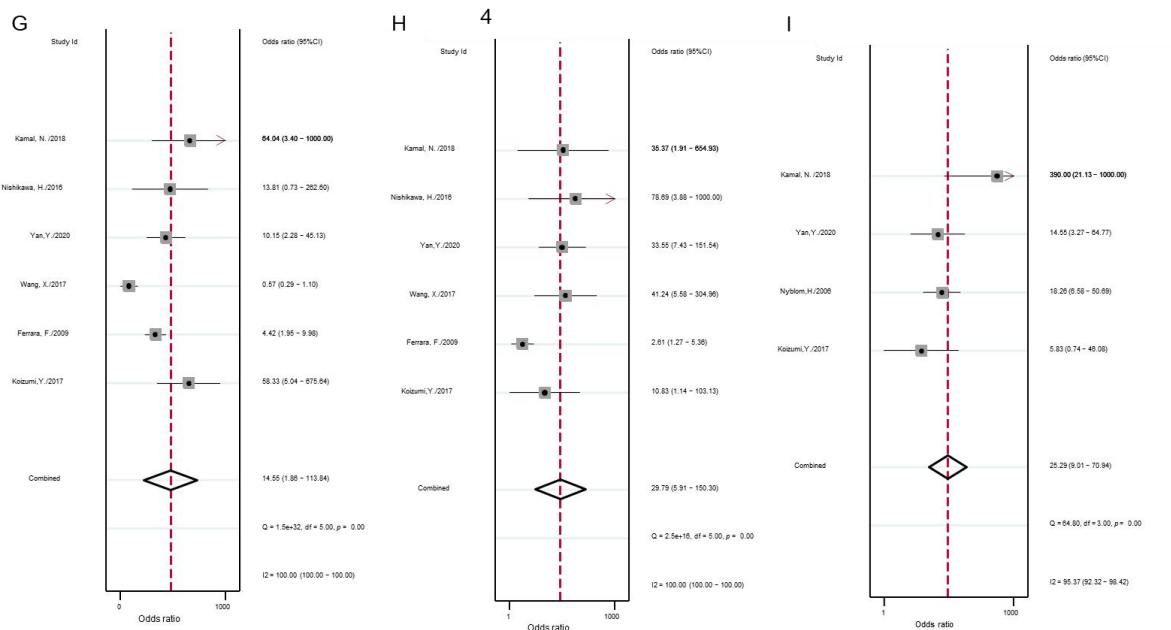
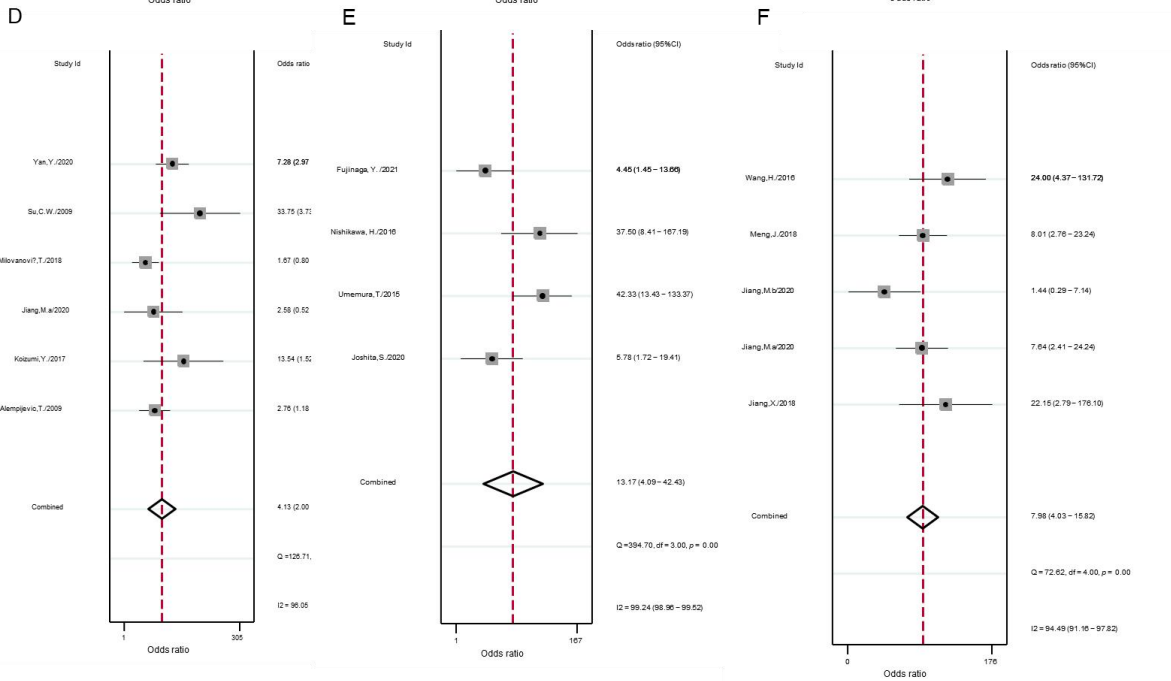
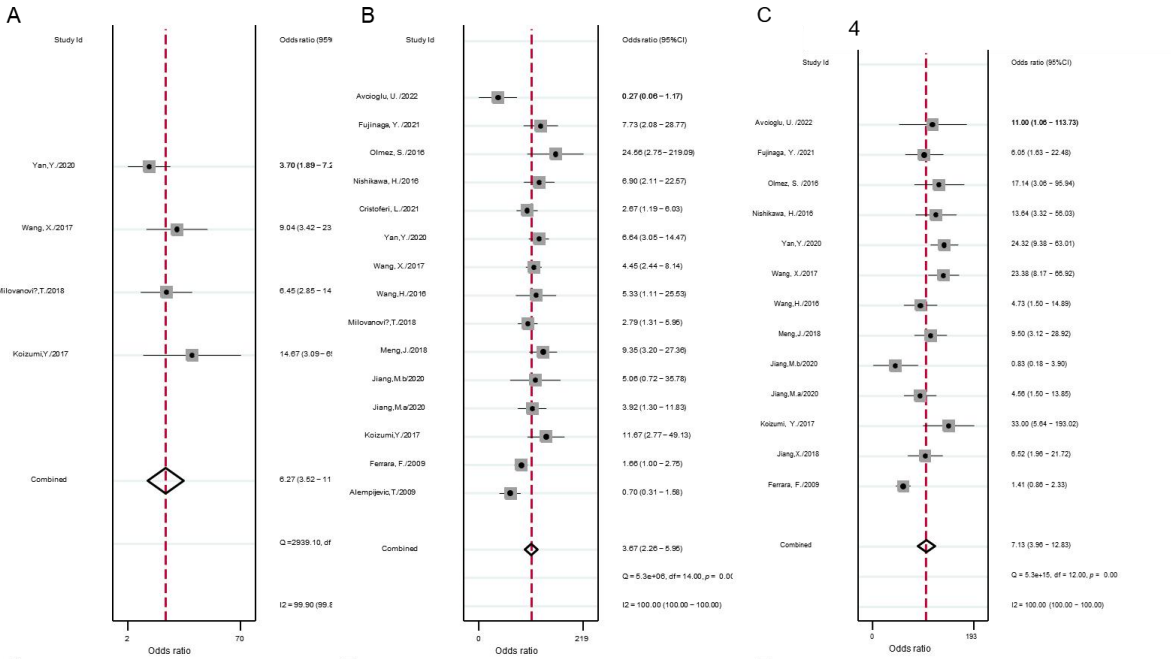
	Risk of Bias			Applicability Concerns			
	Patient Selection	Index Test	Reference Standard	Flow and Timing	Patient Selection	Index Test	Reference Standard
Abdalla, M 2015	Low	Low	Low	Unclear	Low	Low	Low
Alempijevic, T 2009	Low	Unclear	Low	Low	Low	Low	Low
Avcioglu, U 2022	Unclear	Low	Low	Low	Low	Low	Low
Bowius, C.L 2016	Low	Unclear	Unclear	Unclear	Low	Low	Low
Corpechot, C 2012	Low	Low	Low	Low	Low	Low	Low
Corpechot, C 2014	Low	Low	Low	Unclear	Low	Low	Low
Crisafiori, L 2021	Low	Low	Low	Low	Low	Low	Low
E Anastasiou O 2016	Low	Low	Low	Low	Low	Low	Low
Eaton, J.E 2016	Low	Low	Low	Low	Low	Low	Low
Ehken, H 2016	Low	Unclear	Unclear	Low	Low	Low	Low
Ferrara, F 2009	Low	Unclear	Low	Low	Low	Low	Low
Ferronato, M 2022	Unclear	Low	Unclear	Low	Low	Low	Low
Floreani, A 2011	Low	Low	Low	Unclear	Low	Low	Low
Fujinaga, Y 2021	Unclear	Low	Low	Unclear	Low	Low	Low
Garcia, I 2022	Unclear	Low	Unclear	Low	Low	Low	Low
Gomez-Dominguez, E 2008	Low	Low	Low	High	Low	Low	Low
Guo, L 2017	Low	Low	Unclear	Low	Low	Low	Low
Harrison, J. 2016	Low	Low	Unclear	Low	Low	Low	Low
Hartl, J 2016 a	Low	Low	Low	Low	Low	Low	Low
Hartl, J 2016 b	Low	Low	Low	Low	Low	Low	Low
Jank, M.K. 2021	Low	Unclear	Unclear	Low	Low	Low	Low
Jiang, M 2020 a	Low	Low	Low	Low	Low	Low	Low
Jiang, M 2020 b	Low	Low	Low	Low	Low	Low	Low
Jiang, X 2018	Low	Low	Unclear	Unclear	Low	Low	Low
Joshi, S 2020	Low	Low	Low	Low	Low	Low	Low
Kamal, N 2018	Unclear	Low	Unclear	Unclear	Low	Low	Low
Kim, J.K 2014	Low	Unclear	Unclear	Unclear	Low	Low	Low
Kaluzni, Y 2017	Low	Low	Low	High	Low	Low	Low
Krawczyk, M 2017	Low	Low	Low	Unclear	Low	Low	Low
Li, X 2020	Low	Low	Low	Unclear	Low	Low	Low
Liu, L 2019	Low	Low	Low	Low	Low	Low	Low
Manesis, E. K 2021	Low	Low	Low	Low	Low	Low	Low
Meng, J 2018	Low	Low	Low	Low	Low	Low	Low
Mikovanic, T 2018	Low	Low	Low	Low	Low	Low	Low
Nishikawa, H 2016	Low	Low	Unclear	Unclear	Low	Low	Low
Nishikawa, H 2016 PBC	Unclear	Low	Low	Unclear	Low	Low	Low
Nyblom, H 2006	Low	Low	Low	Unclear	Low	Low	Low
Olmez, S 2016	Unclear	Low	Low	Low	Low	Low	Low
Osman, K 2021	Low	Low	Unclear	Low	Low	Low	Low
Paranagua-Vazozzo, D 2016	Low	Low	Unclear	Low	Low	Low	Low
Park, D.W 2019	Low	Low	Low	Low	Low	Low	Low
Piwczynska, K 2016	Low	Low	Unclear	Unclear	Unclear	Low	Low
Puustinen, J. 2017	Low	Low	Unclear	Low	Low	Low	Low
Rossi, M 2020	Low	Low	Unclear	Low	Low	Low	Low
Sheptulina, A 2015 PBC	Unclear	Low	Unclear	Unclear	Low	Low	Low
Sheptulina, A 2016	Low	Low	Low	Low	Low	Low	Low
Soh, E 2022	Low	Low	Low	Low	Low	Low	Low
Su, C.W 2009	Low	Low	Unclear	Low	Low	Low	Low
Umemura, T 2015	Low	Low	Low	Low	Low	Low	Low
Umetsu, S 2018	Low	Low	Low	Low	Low	Low	Low
Wang, H 2016	Low	Low	Low	Low	Low	Low	Low
Wang, H 2020	Low	Low	Low	Low	Low	Low	Low
Wang, J 2017	Low	Low	Low	Low	Low	Low	Low
Wang, X 2017	Low	Low	Unclear	Unclear	Low	Low	Low
Wang, Z 2018	Low	Low	Low	Low	Low	Low	Low
Xing, X 2020	Low	Low	Low	Low	Low	Low	Low
Xu, Q 2017	Low	Low	Low	Low	Low	Low	Low
Yan, Y 2020	Low	Low	Low	Unclear	Low	Low	Low
Youssef, A. 2013	Low	Low	Low	Unclear	Low	Low	Low
Zachou, K 2021	Low	Low	Low	Low	Low	Low	Low
Zeng, J 2017	Low	Low	Low	Low	Low	Low	Low
Zhang, D.K 2014	Low	Low	Low	Low	Low	Low	Low

● High ? Unclear ● Low

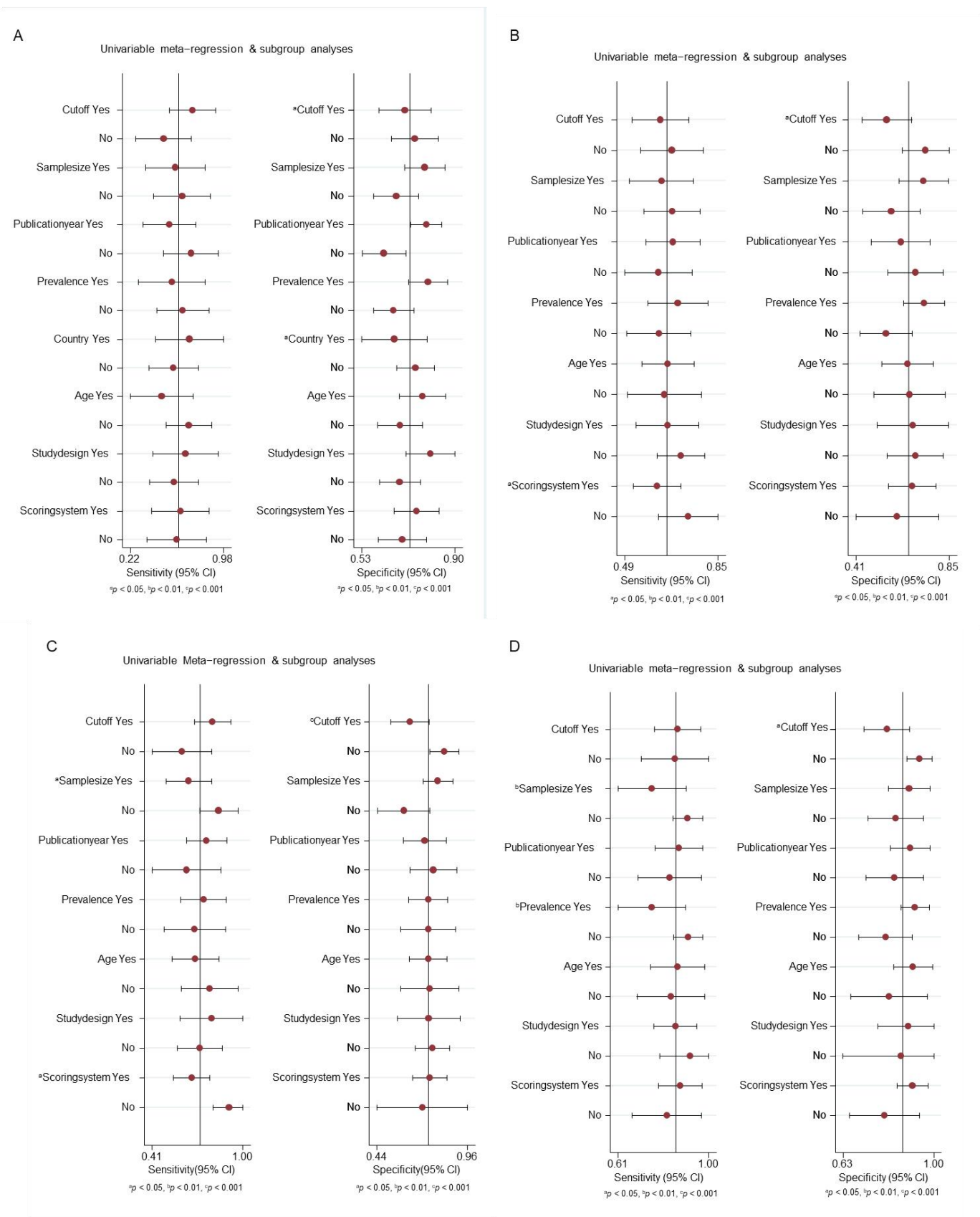
Supplementary Figure 1 Quality assessment of included studies by Quality Assessment of Diagnostic Accuracy Studies-2. Risk of bias and applicability concerns summary graph.



Supplementary Figure 2 Forest plots of diagnostic odds ratio of non-invasive methods in autoimmune hepatitis patients. A and B: Aspartate aminotransferase to platelet ratio index (APRI, A) and Fibrosis-4 index (FIB-4, B) to predict significant fibrosis; C-E: APRI (C), FIB-4 (D) and aspartate aminotransferase to alanine aminotransferase ratio (E) to predict advanced fibrosis; F to H: APRI (F), FIB-4 (G) and shear wave elastography (H) to predict cirrhosis.

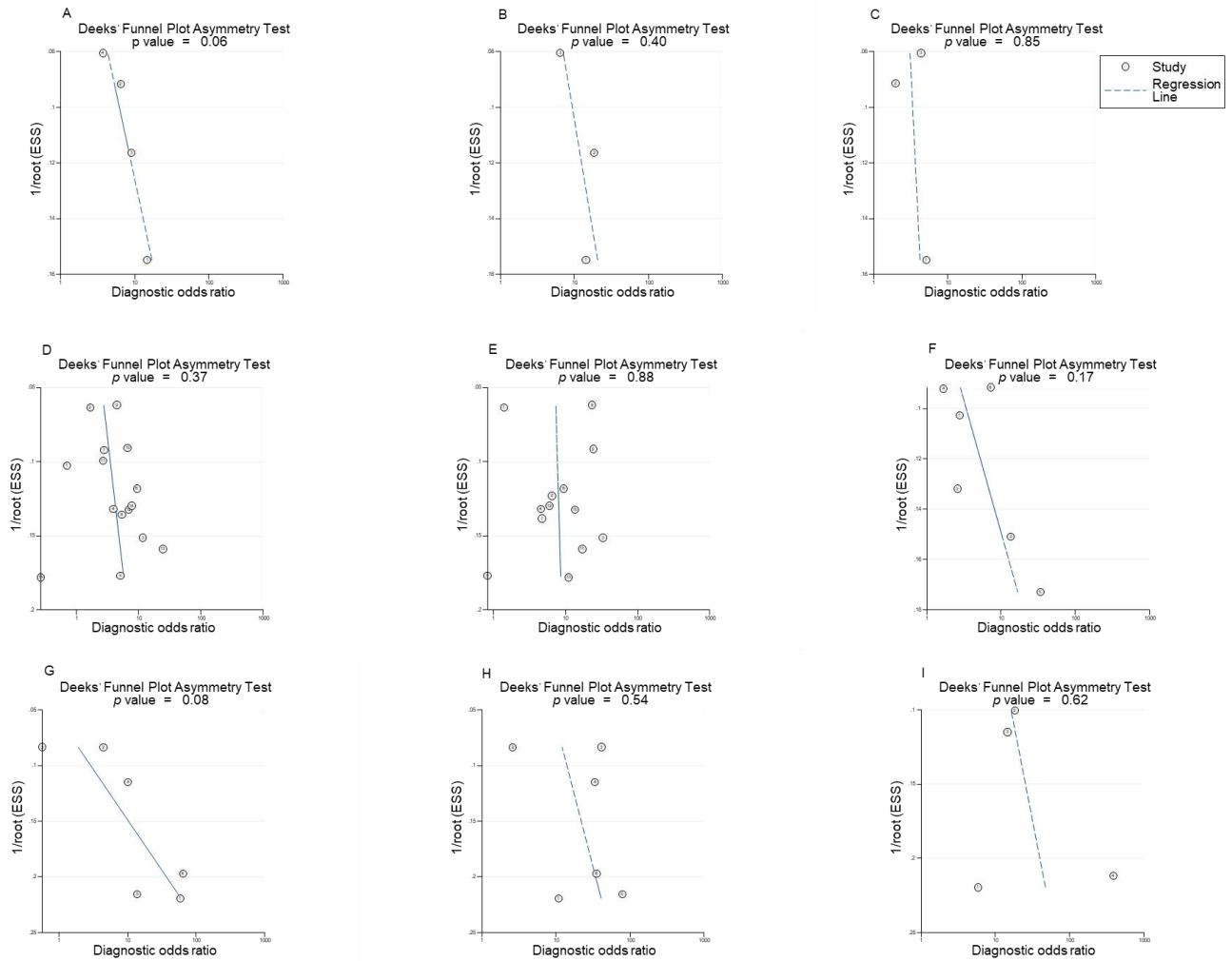


Supplementary Figure 3 Forest plots of diagnostic odds ratio of non-invasive methods in primary biliary cholangitis patients. A: Aspartate aminotransferase to platelet ratio index (APRI) to predict significant fibrosis; B to F: APRI (B), Fibrosis-4 index (FIB-4, C), aspartate aminotransferase to alanine aminotransferase ratio (AAR, D), mac-2-binding protein (E) and red cell distribution width to platelet ratio (F) to predict advanced fibrosis; G to I: APRI (G), FIB-4 (H) and AAR (I) to predict cirrhosis.F



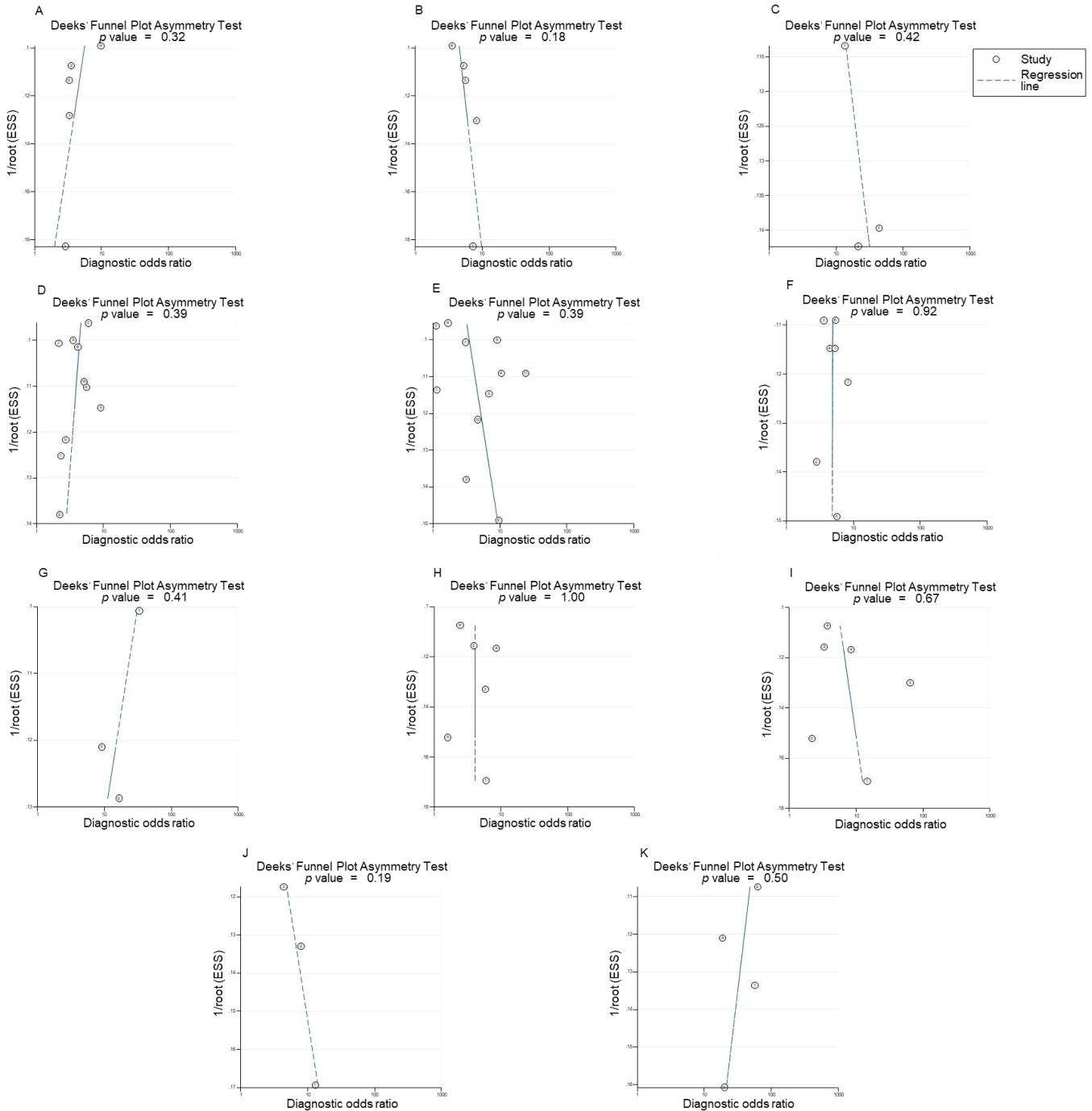
DOI: 10.3748/wjg.v0.i0.0000 Copyright ©The Author(s) 2023.

Supplementary Figure 4 Meta regression analysis in autoimmune liver disease patients. **A:** Aspartate aminotransferase to platelet ratio index (APRI) for detecting advanced fibrosis (AF) in autoimmune hepatitis patients; **B to D:** APRI (B), Fibrosis-4 index (C) and transient elastography (D) for detecting AF in primary biliary cholangitis patients.



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Supplementary Figure 5 Deek's funnel plot asymmetry test for publication bias of aspartate aminotransferase to platelet ratio index, Fibrosis-4 index and aspartate aminotransferase to alanine aminotransferase ratio in primary biliary cholangitis patients. A to C: Aminotransferase to platelet ratio index (APRI, A), Fibrosis-4 index (FIB-4, B) and alanine aminotransferase ratio (AAR, C) to predict significant fibrosis; D to F: APRI (D), FIB-4 (E) and AAR (F) to predict advanced fibrosis; G to I: APRI (G), FIB-4 (H) and AAR (I) to predict cirrhosis.



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Supplementary Figure 6 Deek's funnel plot asymmetry test for publication bias of aspartate aminotransferase to platelet ratio index, Fibrosis-4 index, aspartate aminotransferase to alanine aminotransferase ratio and shear wave elastography in autoimmune hepatitis patients. A to C: Aminotransferase to platelet ratio index (APRI, A), Fibrosis-4 index (FIB-4, B) and shear wave elastography (SWE, C) to predict significant fibrosis; D to G: APRI, FIB-4 (D), alanine aminotransferase ratio (AAR, E) and SWE (F) to predict advanced fibrosis (G); H to K: APRI (H), FIB-4 (I), AAR (J) and SWE (K) to predict cirrhosis.

Supplementary Table 1 Details of search strategy

Item	Searches	Results	Search type
	liver[Title/Abstract] OR hepat*[Title/Abstract]	1367344	Advanced
	autoimmune[Title/Abstract]	187479	Advanced
	"Hepatitis, Autoimmune"[Mesh]	4301	Advanced
	AIH[Title/Abstract] OR AILD[Title/Abstract]	3507	Advanced
	(#1 AND #2) OR #3 OR #4	18838	Advanced
	"Cholangitis, Sclerosing"[Mesh]	4600	Advanced
	primary sclerosing cholangit*[Title/Abstract]	11606	Advanced
	OR PSC [Title/Abstract]		
	#6 OR #7	12967	Advanced
	"Liver Cirrhosis, Biliary"[Mesh]	8690	Advanced
	primary biliary cholangit*[Title/Abstract] OR		
	PBC [Title/Abstract] OR primary biliary	11613	Advanced
	cirrhosis [Title/Abstract]		
PubM	#7 OR #10	21811	Advanced
ed/M	#5 OR #8 OR #11	38620	Advanced
EDLI	"Liver Cirrhosis"[Mesh]	101159	Advanced
NE	liver fibrosis*[Title/Abstract] OR hepatic		
	fibrosis* [Title/Abstract] OR cirrhosis*	128607	Advanced
	[Title/Abstract] OR cirrhoses*[Title/Abstract]		
	#13 OR #14	157001	Advanced
	stiff*[Title/Abstract]	101538	Advanced
	fibroscan[All fields] OR "Fibro Scan"[All fields]		
	OR "transient elasto*" [All fields] OR	25585	Advanced
	kpa[Title/Abstract]		
	"Elasticity Imaging Techniques"[Mesh]	11494	Advanced
	Elasticity Imaging Techniques[Title/Abstract]		
	OR shear		
	wave elastography[Title/Abstract] OR	8559	Advanced
	magnetic resonance		
	elastography[Title/Abstract] OR		

	MRE[Title/Abstract] OR SWE[Title/Abstract]		
	OR Acoustic Radiation Force Impulse[Title/Abstract] OR ARFI[Title/Abstract]		
	#16 OR #17 OR #18 OR #19	130550	Advanced
	APRI[Title/Abstract] OR aspartate aminotransferase to platelets ratio index[Title/Abstract] OR 'AST to platelet ratio index'[Title/Abstract]	2003	Advanced
	fibrosis-4 index[Title/Abstract] OR FIB-4[Title/Abstract]	2369	Advanced
	AAR[Title/Abstract] OR AST/ALT ratio OR aspartate aminotransferase/alanine aminotransferase ratio [Title/Abstract]	2584	Advanced
	RPR[Title/Abstract] OR red cell distribution width to platelet ratio[Title/Abstract]	1686	Advanced
	PC/SD[Title/Abstract] OR Platelet count to spleen diameter ratio[Title/Abstract]	41	Advanced
	M2BP[Title/Abstract] OR Mac-2 binding protein [Title/Abstract]	331	Advanced
	#21 OR #22 OR #23 OR #24 OR #25 OR #26	7581	Advanced
	#20 OR #27	137110	Advanced
	#12 AND #15 AND #28	311	Advanced
	#12 AND #15 AND #28, filters:from 2006 - 2022	295	Advanced
	'autoimmune hepatitis'/exp OR 'primary biliary cirrhosis' /exp OR 'primary sclerosing cholangitis'/exp	39481	Advanced
EMBA	'autoimmune hepatitis':ab,ti OR AIH:ab,ti	13480	Advanced
SE	'primary biliary cholangitis':ab,ti OR 'primary biliary cirrhosis':ab,ti OR PBC:ab,ti	17280	Advanced
	'primary sclerosing cholangitis':ab,ti OR	18408	Advanced

PSC:ab,ti		
'liver cirrhosis'/exp OR 'liver fibrosis'/exp	244985	Advanced
'hepatic fibrosis':ab,ti OR cirrhosis:ab,ti	177205	Advanced
#1 OR #2 OR #3 OR #4	52601	Advanced
#5 OR #6	273767	Advanced
#7 AND #8	23099	Advanced
'elastography'/exp	38528	Advanced
'elasticity imaging techniques':ab,ti	32	Advanced
'fibroscan':ab,ti OR 'fibro scan':ab,ti OR	11318	Advanced
'transient elasto*':ab,ti		
'shear wave elastography':ab,ti OR SWE:ab,ti	5962	Advanced
'magnetic resonance elastography':ab,ti OR	4769	Advanced
MRE:ab,ti		
'acoustic radiation force impulse':ab,ti OR	1921	Advanced
ARFI:ab,ti		
'aspartate aminotransferase to platelets ratio		
index':ab,ti OR 'AST to platelet ratio index':ab,ti	4616	Advanced
OR APRI:ab,ti		
'fibrosis-4 index':ab,ti OR 'FIB-4':ab,ti	5111	Advanced
'aspartate aminotransferase alanine		
aminotransferase ratio':ab,ti OR 'AST ALT	3762	Advanced
ratio':ab,ti OR AAR:ab,ti		
'red cell distribution width to platelet		
ratio':ab,ti OR RPR:ab,ti	3280	Advanced
'platelet count to spleen diameter ratio':ab,ti		
OR 'PC SD ratio':ab,ti	53	Advanced
'mac-2 binding protein':ab,ti OR M2BP:ab,ti	530	Advanced
#10 OR #11 OR #12 OR #13 OR #14 OR #15		
OR #16 OR #17 OR #18 OR #19 OR #20 OR	58719	Advanced
#21		
#9 AND #22	1044	Advanced
Cochr MeSH descriptor: [Hepatitis, Autoimmune]	36	Advanced

ane	explode all trees		
	("autoimmune hepatitis"):ti,ab,kw	250	Advanced
	MeSH descriptor: [Liver Cirrhosis, Biliary]		
	explode all trees	334	Advanced
	("primary biliary cholangitis" or "primary biliary cirrhosis"):ti,ab,kw	898	Advanced
	MeSH descriptor: [Cholangitis, Sclerosing]		
	explode all trees	107	Advanced
	("primary sclerosing cholangitis"):ti,ab,kw	309	Advanced
	#1 OR #2 OR #3 OR #4 OR #5 OR #6	1379	Advanced
	MeSH descriptor: [Elasticity Imaging Techniques]		
	explode all trees	171	Advanced
	("Elasticity Imaging Techniques"):ti,ab,kw	171	Advanced
	(fibroscan or "fibro scan" or "transient elasto*"):ti,ab,kw	573	Advanced
	("shear wave elastography" or SWE):ti,ab,kw	276	Advanced
	("Acoustic Radiation Force Impulse" or ARFI):ti,ab,kw	42	Advanced
	("magnetic resonance elastography" or MRE):ti,ab,kw	177	Advanced
	("aspartate aminotransferase to platelets ratio index" or "AST to platelet ratio index" or APRI):ti,ab,kw	187	Advanced
	("fibrosis-4 index" or FIB-4):ti,ab,kw	212	Advanced
	("aspartate aminotransferase alanine aminotransferase ratio" or "AST ALT ratio" or AAR):ti,ab,kw	201	Advanced
	("red cell distribution width to platelet ratio" or RPR):ti,ab,kw	150	Advanced
	("Platelet count to spleen diameter ratio" or "PC SD ratio"):ti,ab,kw	0	Advanced
	("Mac-2 binding protein" or M2BP):ti,ab,kw	18	Advanced

#8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19	1714	Advanced
#7 AND #20	41	Advanced

Supplementary Table 2 Original data of transient elastography diagnostic accuracy in pre-treatment autoimmune hepatitis and primary biliary cholangitis patients

	Ref.	Cut-off values	Sensitivity	Specificity	AUROC
AIH	SF Xu <i>et al</i> ^[1] , 2017	6.45	0.821	0.875	0.878
	AF Xu <i>et al</i> ^[1] , 2017	8.75	0.8	0.84	0.883
	Cirrhosis Xu <i>et al</i> ^[1] , 2017	12.5	0.87	0.896	0.914
PBC	AF Joshita <i>et al</i> ^[2] , 2020	7	0.47	0.83	0.763
	Cristoferi <i>et al</i> ^[3] , 2020	6.75	0.85	0.75	0.83

AF: Advanced fibrosis; AIH: Autoimmune hepatitis; AUROC: Area under the receiver operator curve; PBC: Primary biliary cholangitis; SF: Significant fibrosis.

Supplementary Table 3 Diagnostic criteria of studies about autoimmune hepatitis included in this study

No.	Ref.	Disease	Diagnostic criteria
1	Youssef <i>et al</i> ^[4] , 2013	AIH	NA
2	Kim <i>et al</i> ^[5] , 2014	AIH	IAIHG 1999
3	Abdollahi <i>et al</i> ^[6] , 2015	AIH	NA
4	Harrison <i>et al</i> ^[7] , 2016	AIH	IAIHG 1999
5	Hartl <i>et al</i> ^[8] , 2016	AIH	EASL 2015
	Hartl <i>et al</i> ^[8] , 2016	AIH	
6	Nishikawa <i>et al</i> ^[9] , 2016	AIH	IAIHG 1999
7	E Anastasiou <i>et al</i> ^[10] , 2016	AIH	IAIHG 2008
8	Piwczyńska <i>et al</i> ^[11] , 2016	AIH	NA
9	Sheptulina <i>et al</i> ^[12] , 2016	AIH	IAIHG 1999
10	Guo <i>et al</i> ^[13] , 2017	AIH	IAIHG 2008

11	Paranagua-Vezozzo <i>et al</i> ^[14] , 2017	AIH	NA
12	Puustinen <i>et al</i> ^[15] , 2017	AIH	IAIHG 2008
13	Wang <i>et al</i> ^[16] , 2017	AIH	IAIHG 1999
14	Xu <i>et al</i> ^[1] , 2017	AIH	IAIHG 2008
15	Zeng <i>et al</i> ^[17] , 2017	AIH	NA
16	Liu <i>et al</i> ^[18] , 2019	AIH	NA
17	Park <i>et al</i> ^[19] , 2019	AIH	IAIHG 1999
18	Li <i>et al</i> ^[20] , 2020	AIH	IAIHG 1999
19	Wang <i>et al</i> ^[21] , 2020	AIH	NA
20	Xing <i>et al</i> ^[22] , 2020	AIH	IAIHG 1999
21	Janik <i>et al</i> ^[23] , 2021	AIH	IAIHG 1999
22	Zachou <i>et al</i> ^[24] , 2021	AIH	NA
23	Ferronato <i>et al</i> ^[25] , 2022	AIH	NA
24	Soh <i>et al</i> ^[26] , 2022	AIH	NA

AIH: Autoimmune hepatitis; IAIHG: International Autoimmune Hepatitis Group; NA: Not available.

Supplementary Table 4 Subgroup analysis of diagnostic criteria in prediction of significant fibrosis, advanced fibrosis and cirrhosis in autoimmune hepatitis

Parameter	Stage	Subgroup	Sensitivity (95% CI)	Specificity (95% CI)	AUROC (95% CI)
AIH	Diagnostic criteria	SF	0.88 (0.82-0.92)	0.86 (0.77-0.91)	0.91 (0.88-0.93)
		AF	0.79 (0.68-0.87)	0.89 (0.79-0.95)	0.90 (0.88-0.93)
		Cirrhosis	0.88 (0.81-0.93)	0.95 (0.86-0.98)	0.90 (0.87-0.92)

AIH: Autoimmune hepatitis; IAIHG: International Autoimmune Hepatitis Group

Supplementary Table 5 Original data of diagnostic accuracy of acoustic radiation force impulse, magnetic resonance elastography, shear wave elastography and mac-2-binding protein in

autoimmune hepatitis and primary biliary cholangitis patients

Mode 1	Disease	Fibrosis stage	Ref.	Cut-off values	Sensitivity	Specificity	AUROC
	AIH	Cirrhosis	Paranagua-Vezozzo <i>et al</i> ^[14] , 2016	1.65	0.88	0.76	0.78
ARFI		SF	Zhang <i>et al</i> ^[27] , 2014	1.51	0.8	0.77	0.83
	PBC	AF	Zhang <i>et al</i> ^[27] , 2014	1.79	0.91	0.82	0.93
		Cirrhosis	Zhang <i>et al</i> ^[27] , 2014	2.01	1	0.79	0.91
		SF	Xing <i>et al</i> ^[22] , 2020	10	0.909	0.577	0.84
			Zeng <i>et al</i> ^[17] , 2017	9.7	0.817	0.81	0.85
			Soh <i>et al</i> ^[26] , 2022	8.2	0.903	0.904	0.737
	AIH	AF	Xing <i>et al</i> ^[22] , 2020	15.8	0.878	0.823	0.89
			Zeng <i>et al</i> ^[17] , 2017	13.2	0.83	0.746	0.85
			Soh <i>et al</i> ^[26] , 2022	12.2	0.71	0.79	0.815
		Cirrhosis	Janik <i>et al</i> ^[23] , 2021	16.1	0.9	0.86	0.93
SWE			Xing <i>et al</i> ^[22] , 2020	19.3	0.871	0.903	0.94
			Zeng <i>et al</i> ^[17] , 2017	16.3	0.87	0.802	0.86
			Soh <i>et al</i> ^[26] , 2022	14.3	0.733	0.87	0.854
		SF	Yan <i>et al</i> ^[28] , 2020	10.7	0.75	0.89	0.88
			Manesis <i>et al</i> ^[29] , 2021	7.8	0.844	0.87	0.874
	PBC	AF	Yan <i>et al</i> ^[28] , 2020	12.2	0.9	0.94	0.97
			Manesis <i>et al</i> ^[29] , 2021	10	0.808	0.81	0.8
		Cirrhosis	Yan <i>et al</i> ^[28] , 2020	14.1	0.96	0.95	0.99
			Manesis <i>et al</i> ^[29] , 2021	11.9	0.9	0.826	0.903
	AIH	AF	Wang <i>et al</i> ^[16] , 2017	4.1	0.895	1	0.97
		Cirrhosis	Wang <i>et al</i> ^[16] , 2017	4.5	0.923	0.96	0.98
MRE		SF	Osman <i>et al</i> ^[30] , 2021	3.8	0.51	0.9	0.6
	PBC	AF	Osman <i>et al</i> ^[30] , 2021	3.7	0.75	0.76	0.783
		Cirrhosis	Osman <i>et al</i> ^[30] , 2021	4.6	0.8	0.83	0.82
	AIH	AF	Nishikawa <i>et al</i> ^[9] , 2016	3.7	0.643	0.833	0.747
M2BP		Cirrhosis	Nishikawa <i>et al</i> ^[9] , 2016	3.9	0.944	0.758	0.853
	PBC	SF	Umemura <i>et al</i> ^[31] , 2015	1	0.93	0.93	0.979

AF	Joshita <i>et al</i> ^[2] , 2020	1	0.46	0.88	0.767
	Umemura <i>et al</i> ^[31] , 2015	1.4	0.83	0.9	0.83
	Nishikawa <i>et al</i> ^[32] , 2016	3.1	0.857	0.86	0.87
	Fujinaga <i>et al</i> ^[33] , 2021	0.9	0.667	0.614	0.63
Cirrhosis	Umemura <i>et al</i> ^[31] , 2015	2	0.39	1	0.965
	Nishikawa <i>et al</i> ^[32] , 2016	3.4	0.5	0.927	0.73

AIH: Autoimmune hepatitis; AF: Advanced fibrosis; ARFI: Acoustic radiation force impulse; AUROC: Area under the receiver operator curve; FIB-4: Fibrosis-4 index; M2BP: Mac-2-binding protein; MRE: Magnetic resonance elastography; SF: Significant fibrosis; PBC: Primary biliary cholangitis; SWE: Shear wave elastography.

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