

Global Disparities in Hepatocellular Carcinoma Care: Insights from the ESGAR Global Abdominal Imaging Forum Electronic Supplementary Materials

HCC survey questions:

1. In which continent do you practice?

- Africa
- Asia
- Australasia/Oceania
- Europe
- North America
- South America

Supplementary – which country? (free text)

2. What is your Profession?

- Doctor - Independent clinical practice
- Doctor - Training
- Medical Student
- Healthcare administration
- Nursing
- Pharma/Industry
- Radiographer
- Other: (free text)_____

3. If you are a doctor - what is your specialty?

- General Medicine
- General Practice/Family Medicine
- Hepatology/Gastroenterology
- Public health
- Oncology
- Radiology
- Surgery
- Other:(free text)_____

4. Where is your main practice location?

- Community hospital –rural area
- Community hospital - urban area
- Government organization
- Non-Government organization
- Private Hospital
- Private Clinic
- Retired/Not employed
- University/Teaching Hospital
- Other - (free text)

5. What is the commonest cause of chronic liver disease in your patient population?

- Alcohol

- Hepatitis B
- Hepatitis C
- Metabolic
- Other: (free text)

6. Does your department have a multidisciplinary team meeting to discuss HCC patient management?

- No
- Yes

7. Which tests are performed for HCC surveillance in your practice? (Tick all that apply)

- No surveillance performed
- Alpha Fetoprotein
- Magnetic resonance imaging
- Ultrasound
- Don't know

8. How accessible are these imaging modalities for HCC for your patients (1=not accessible, 3 = quite accessible, 5 = easily accessible)?

- Contrast Enhanced Ultrasound (1-5)
- CT (1-5)
- MRI (1-5)
- PET/CT (1-5)
- Ultrasound (1-5)
- Don't know

9. What technique is the commonest to characterize lesions suspicious for HCC in your practice?

- Contrast Enhanced Ultrasound
- CT
- MRI
- PET/CT
- Ultrasound
- Don't know

10. Which guidelines are used in your practice to report CT or MRI in patients at risk of HCC? (Tick all that apply)

- APASL
- EASL
- KLCA-NCC
- LI-RADS
- Don't know
- No guidelines are used

11. Estimate the proportion of liver lesions suspicious of HCC in your practice which undergo biopsy?

- No biopsies are performed
- 1-33%
- 33-66%
- 66-100%

12. What treatments are available for your patients with HCC? (Tick all that apply)

- Liver Transplant

- Locoregional treatment
- Surgery/Resection
- Systemic therapy
- Don't know

13. Which is the commonest locoregional treatment for HCC in your hospital/practice?

- Ablation
- Embolisation/Chemoembolisation
- Radiotherapy – stereotactic
- Radiotherapy – transarterial/selective internal
- None
- Don't know

14. Which systemic therapies are available for your patients with HCC patients (include all the options that apply)?

- Chemotherapy
- Immunotherapy
- Tyrosine kinase inhibitors
- Anti-VEGF and immunotherapy (atezolizumab + bevacizumab)
- None
- Don't know

Supplementary Table 1: Differences in hepatocellular carcinoma care according to the country income level.

	High-income countries (n = 262)	Others (n = 87)	p-value
Commonest cause of chronic liver disease			< 0.001
Alcohol	158 (60.3)	25 (28.7)	
Hepatitis B	28 (10.7)	33 (37.9)	
Hepatitis C	36 (13.7)	11 (12.6)	
Metabolic	38 (14.5)	17 (19.5)	
Other	2 (0.8)	1 (1.1)	
Availability of multidisciplinary HCC meeting	209 (79.8)	55 (63.2)	0.002
Test for HCC surveillance*			
No surveillance	3 (1.1)	3 (3.4)	0.167
Alpha Fetoprotein	211 (80.5)	66 (75.9)	0.351
MRI	139 (53.1)	50 (57.5)	0.474
Ultrasound	230 (87.8)	76 (87.4)	0.916
Don't know	3 (1.1)	0 (0)	0.577
Accessibility of imaging			
CEUS	3 (1, 5)	1 (1, 2)	< 0.001
CT	5 (5, 5)	5 (5, 5)	0.028
MRI	5 (4, 5)	4 (3, 5)	0.008
PET/CT	4 (3, 5)	3 (2, 4)	0.007
Ultrasound	5 (5, 5)	5 (5, 5)	0.419
Commonest imaging to characterize a lesion suspicious for HCC			0.032
CEUS	4 (1.5)	3 (3.4)	
CT	96 (36.6)	44 (50.6)	
MRI	155 (59.2)	35 (40.2)	
PET/CT	1 (0.4)	1 (1.1)	

Ultrasound	6 (2.3)	4 (4.6)	
Guidelines used in clinical practice to report CT or MRI*			
APASL	2 (0.8)	2 (2.3)	1.000
EASL	58 (22.1)	4 (4.6)	< 0.001
KLCA-NCC	2 (0.8)	3 (1.5)	0.260
LI-RADS	223 (85.1)	74 (85.1)	0.990
Don't know	7 (2.7)	4 (4.6)	0.477
No guidelines are used	26 (9.9)	12 (13.8)	0.315
Proportion of suspected HCC undergoing biopsy			0.816
No biopsies performed	25 (9.5)	7 (8.0)	
1-33%	152 (58.0)	47 (54.0)	
33-66%	50 (19.1)	19 (21.8)	
66-100%	35 (13.4)	14 (16.1)	
Available treatments for HCC*			
Liver transplant	190 (72.5)	45 (51.7)	< 0.001
Locoregional treatments	237 (90.5)	70 (80.5)	0.013
Surgery/Resection	241 (92.0)	73 (83.9)	0.030
Systemic therapy	234 (89.3)	71 (81.6)	0.061
Don't know	12 (4.6)	9 (10.3)	0.050
Commonest locoregional treatment for HCC			0.011
Ablation	102 (38.9)	17 (19.5)	
Embolisation/Chemoembolisation	106 (40.5)	47 (54.0)	
Radiotherapy – stereotactic	3 (1.1)	4 (4.6)	
Radiotherapy – transarterial/selective internal	10 (3.8)	2 (2.3)	
None	12 (4.6)	5 (5.7)	
Don't know	29 (11.1)	12 (13.8)	
Available systemic therapies for HCC*			
Chemotherapy	174 (66.4)	67 (77.0)	0.064
Immunotherapy	168 (64.1)	47 (54.0)	0.093
Tyrosine kinase inhibitors	136 (51.9)	28 (32.2)	0.001
Anti-VEGF and immunotherapy	160 (61.1)	33 (37.9)	< 0.001
None	3 (1.1)	1 (1.1)	1.000
Don't know	58 (22.1)	16 (18.4)	0.459

Note.—Continuous variables are expressed as medians and interquartile range (25th to 75th percentile) in parenthesis, and they were compared with the Pearson χ^2 test or Fisher's exact test. Categorical variable (accessibility of imaging) was expressed as numbers and percentages in parenthesis, and it was compared with the Mann-Whitney U test. *Multiple answers were allowed. Statistically significant values ($p < 0.05$) are highlighted in bold.

Abbreviations: APASL: Asia-Pacific Association for the Study of the Liver; CEUS: contrast-enhanced ultrasound; CT: computed tomography; EASL: European Association for the Study of the Liver; HCC: hepatocellular carcinoma; KLCA-NCC: Korean Liver Cancer Association-National Cancer Center LI-RADS: Liver Imaging Reporting and Data System; PET: positron emission tomography.

Supplementary Table 2: Differences in hepatocellular carcinoma care between university/teaching hospitals and other practice locations.

	University/Teaching Hospital (n = 208)	Others (n = 200)	p-value
Commonest cause of chronic liver disease			0.225
Alcohol	110 (52.9)	106 (53.0)	

Hepatitis B	31 (14.9)	41 (20.5)	
Hepatitis C	30 (14.4)	22 (11.0)	
Metabolic	34 (16.3)	31 (15.5)	
Other	3 (1.4)	0 (0)	
Availability of multidisciplinary HCC meeting	187 (89.9)	118 (59.0)	< 0.001
Test for HCC surveillance*			
No surveillance	1 (0.5)	6 (2.5)	0.116
Alpha Fetoprotein	172 (82.7)	152 (76.0)	0.095
MRI	120 (57.7)	108 (54.0)	0.453
Ultrasound	183 (88.0)	171 (85.5)	0.460
Don't know	2 (1.0)	4 (2.0)	0.441
Accessibility of imaging			
CEUS	3 (1, 5)	2 (1, 3)	< 0.001
CT	5 (5, 5)	5 (5, 5)	0.148
MRI	5 (4, 5)	4 (3.5, 5)	0.008
PET/CT	4 (3, 5)	3 (2, 4)	< 0.001
Ultrasound	5 (5, 5)	5 (5, 5)	0.890
Commonest imaging to characterize a lesion suspicious for HCC			0.076
CEUS	3 (1.4)	5 (2.5)	
CT	71 (34.1)	91 (45.5)	
MRI	129 (62.0)	96 (62.0)	
PET/CT	1 (0.5)	1 (1.5)	
Ultrasound	4 (1.9)	7 (3.5)	
Guidelines used in clinical practice to report CT or MRI*			
APASL	2 (1.0)	1 (0.5)	1.000
EASL	44 (21.2)	24 (12.0)	0.013
KLCA-NCC	3 (1.4)	3 (1.5)	1.000
LI-RADS	180 (86.5)	161 (80.5)	0.100
Don't know	5 (2.4)	12 (6.0)	0.069
No guidelines are used	19 (9.1)	29 (14.5)	0.093
Proportion of suspected HCC undergoing biopsy			0.001
No biopsies performed	8 (3.8)	26 (13.0)	
1-33%	132 (63.5)	98 (49.0)	
33-66%	40 (19.2)	50 (25.0)	
66-100%	28 (13.5)	26 (13.0)	
Available treatments for HCC*			
Liver transplant	159 (76.4)	113 (56.5)	< 0.001
Locoregional treatments	194 (93.3)	161 (80.5)	< 0.001
Surgery/Resection	197 (94.7)	167 (83.5)	< 0.001
Systemic therapy	197 (94.7)	153 (76.6)	< 0.001
Don't know	3 (1.4)	23 (11.5)	< 0.001
Commonest locoregional treatment for HCC			<0.001
Ablation	80 (38.5)	65 (32.5)	
Embolisation/Chemoembolisation	89 (42.8)	82 (41.0)	
Radiotherapy – stereotactic	5 (2.4)	3 (1.5)	
Radiotherapy – transarterial/selective internal	15 (7.2)	1 (0.5)	
None	6 (2.9)	3 (1.5)	
Don't know	13 (6.3)	36 (18.0)	
Available systemic therapies for HCC*			
Chemotherapy	157 (75.5)	122 (61.0)	0.002
Immunotherapy	142 (68.3)	101 (50.5)	< 0.001
Tyrosine kinase inhibitors	122 (58.7)	57 (28.5)	< 0.001
Anti-VEGF and immunotherapy	141 (67.8)	75 (37.5)	< 0.001
None	0 (0)	4 (2.0)	0.057

Don't know	30 (14.4)	64 (32.0)	< 0.001
------------	-----------	-----------	-------------------

Note.—Continuous variables are expressed as medians and interquartile range (25th to 75th percentile) in parenthesis and they were compared with the Pearson χ^2 test or Fisher's exact test. Categorical variable (accessibility of imaging) was expressed as numbers and percentages in parenthesis and it was compared with the Mann-Whitney U test. *Multiple answers were allowed. Statistically significant values ($p < 0.05$) are highlighted in bold.

Abbreviations: APASL: Asia-Pacific Association for the Study of the Liver; CEUS: contrast-enhanced ultrasound; CT: computed tomography; EASL: European Association for the Study of the Liver; HCC: hepatocellular carcinoma; KLCA-NCC: Korean Liver Cancer Association-National Cancer Center LI-RADS: Liver Imaging Reporting and Data System; PET: positron emission tomography.