



# Exploring prognostic disparities of HCC treatment in the elderly: An analysis of the Korean nationwide cancer registry data

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# Background & Aims

- The incidence of hepatocellular carcinoma (HCC) is rising among the elderly population
- There is a paucity of studies investigating the interplay between age and treatment diversity with respect to survival outcomes.

# Methods

- The study population consisted of 7,014 individuals aged 20 years and older, who were identified through the Korea Primary Liver Cancer Registry for the years 2014 and 2017.
- Baseline characteristics, hepatocellular carcinoma (HCC) stage, treatment modalities, and overall survival (OS) were evaluated.
- Participants were stratified into five age groups (<50, 50-59, 60-69, 70-79, and  $\geq 80$  years), were stratified and compared by BCLC stage and treatment method.

# Methods

- Cox regression model and restricted cubic spline (RCS) analysis were employed to establish the age cutoff at which the efficacy of curative and non-curative treatments diminished.
- Statistical significance was set at  $P < 0.05$  for all analyses.

# Results

Variable	All patients (n=7,014)
<b>Demographic factor</b>	
Sex (male), n(%)	5,555 (79.2%)
Age (years), mean (SD)	62.25 (11.46)
<b>Age group (year), n(%)</b>	
<50	920 (13.1%)
50-59	2,118 (30.2%)
60-69	1,992(28.4%)
70-79	1,511(21.5%)
≥80	473 (6.7%)
Diabetes mellitus	2,012 (28.7%)
Hypertension	3,459(49.3%)
Body mass index (kg/m <sup>2</sup> )	24.05 (3.43)
Smoking habitus	3,169(45.2%)
<b>Etiology of liver disease</b>	
Chronic hepatitis B virus	4,116 (58.7%)
Chronic hepatitis C virus	783 (11.2%)
Alcohol	2,580 (36.8%)
Other	1,137 (16.2%)

Variable	
Serum AST (IU/L)	79 (111)
Serum ALT (IU/L)	52 (70)
Platelet count (X10 <sup>3</sup> /mm <sup>3</sup> )	164 (90)
Serum albumin (g/dl)	3.8 (0.7)
Serum bilirubin (mg/dl)	1.6 (3.1)
International normalized ratio (INR)	1.15 (0.21)
Serum creatinine (mg/dl)	0.99(0.8)
Serum sodium(mg/dl)	138 (4)
<b>Child-Pugh class</b>	
class A	5,151 (73.4%)
class B	1,518 (21.6%)
class C	345 (4.9%)
<b>ECOG performance</b>	
0-1	6,088 (86.8%)
2	592 (8.4%)
3-4	334 (4.8%)

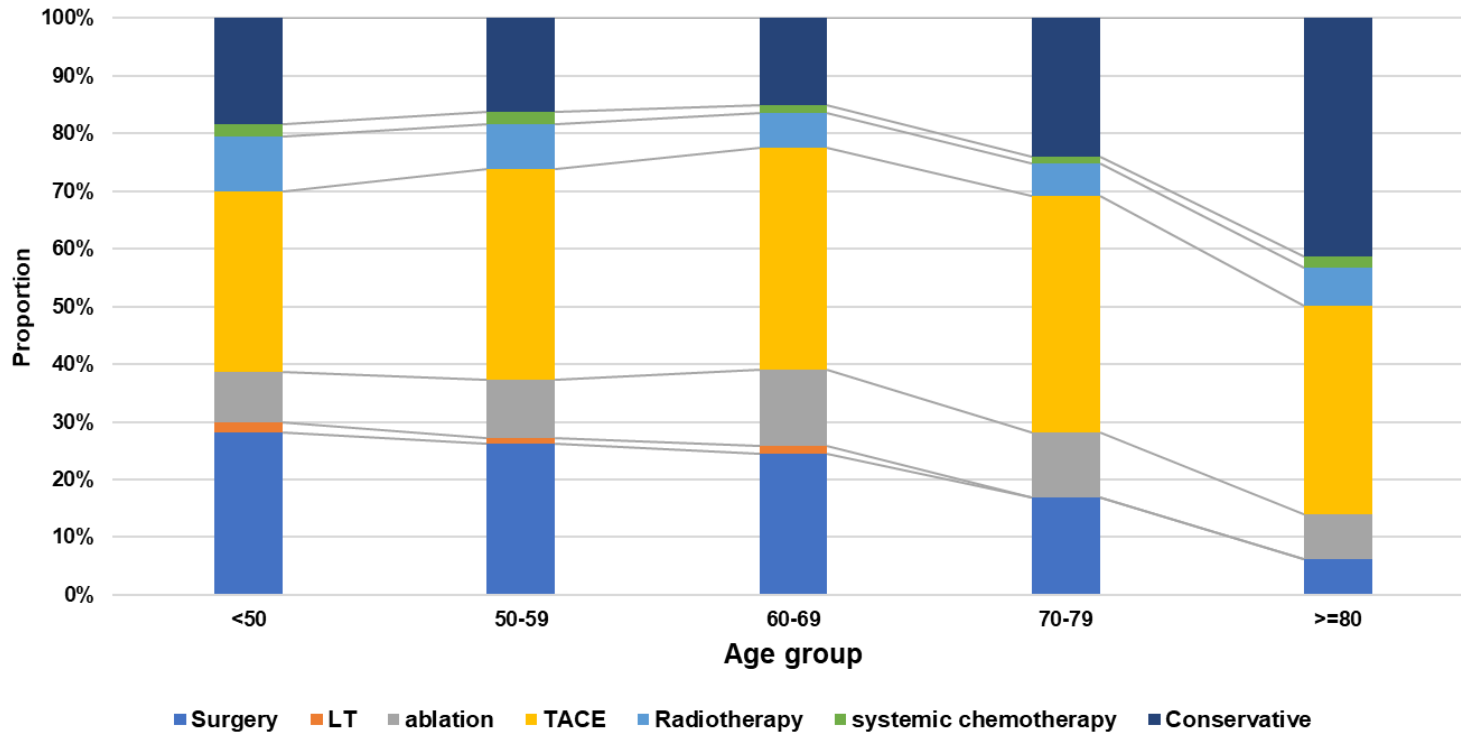
# Results

Variable	
<b>Tumor factor</b>	
AFP (ng/ml), mean(SD)	12246.9(91833.6)
median(IQR), ng/ml	26.95 IQR(5.2-586.175)
<b>Cancer stage</b>	
<b>BCLC staging</b>	
0	1,115 (15.9%)
A	2,190(31.2%)
B	670 (9.6%)
C	2,540 (36.2%)
D	499 (7.1%)
<b>Initial cancer treatment</b>	
<b>Surgical resection</b>	1,587 (22.6%)
<b>Local Ablation therapy</b>	762 (10.9%)
<b>Liver transplantation</b>	67 (1.0%)
<b>Transarterial chemoembolization</b>	2,618(37.3%)
<b>Radiotherapy</b>	118(1.7%)
<b>Systemic chemotherapy</b>	488 (7.0%)
<b>Conservative management</b>	1,374 (19.6%)

- The median age at the time of HCC diagnosis was 62 years with a male predominance (79.2%) and hepatitis B virus infection as the most common etiology (58.7%).
- The age distribution was 13.1% for <50 years, 30.2% for 50-59 years, 28.4% for 60-69 years, 21.5% for 70-79 years, and 6.7% for ≥80 years.

# Results

Treatment methods in different age group



- Patients aged 70 years and above showed a decline in surgical treatment rate (28% to 14.3%).
- A marked increase in conservative treatment rate (18% to 28%) compared to those under 70 years of age.

# Results

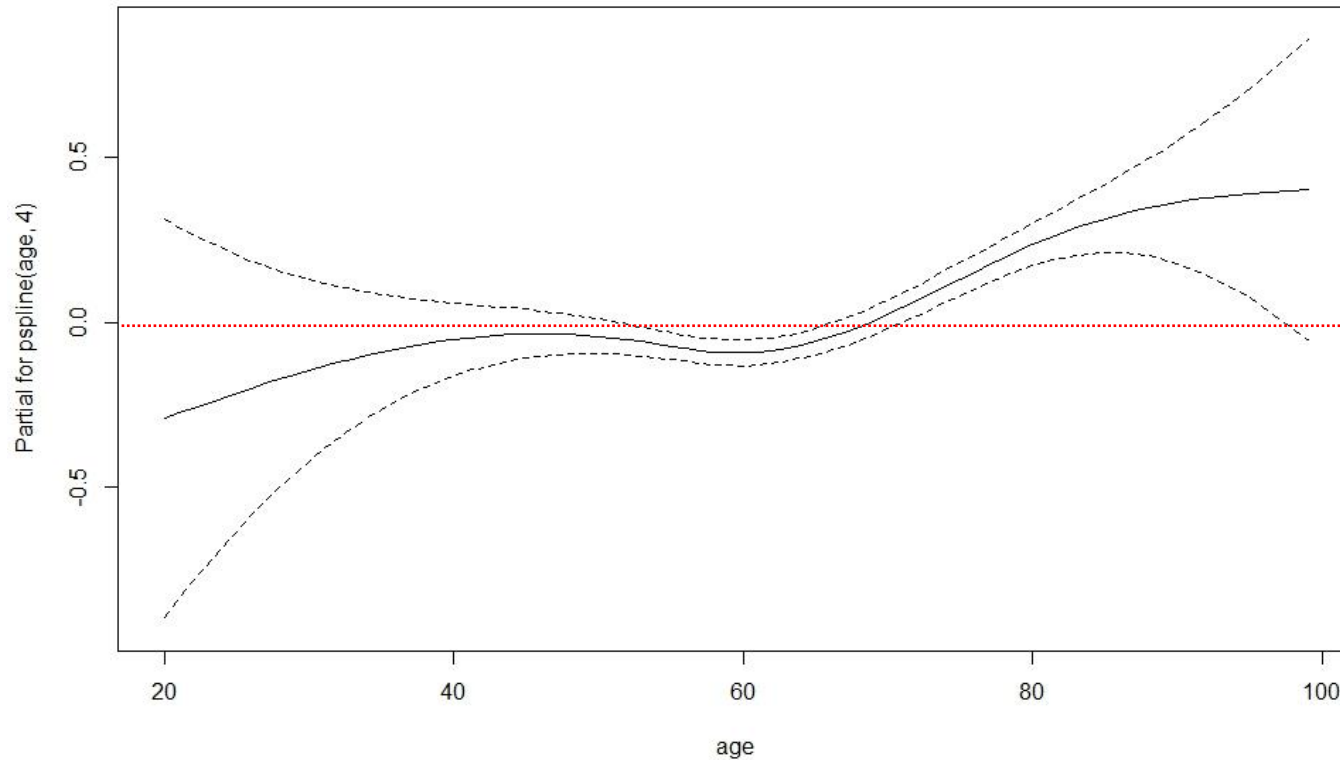
Variable	Unadjusted hazard ratio (95% CI)	P value	Adjusted hazard ratio (95% CI)	P value
<b>Age Group</b>				
<50	1		1	
50-59	0.951 0.855-1.058	0.355	0.995 0.874-1.133	0.941
60-69	0.958 0.861-1.066	0.431	1.134 0.995-1.293	0.060
70-79	1.394 1.252-1.553	<0.001	1.478 1.291-1.691	<0.001
≥80	2.313 2.024-2.642	<0.001	1.937 1.620-2.316	<0.001
<b>Male</b>	1.173 1.086-1.268	<0.001	0.927 0.834-1.031	0.164
<b>Diabetes</b>	1.096 1.026-1.172	0.007	1.054 0.972-1.143	0.203
<b>HTN</b>	0.949 0.893-1.009	0.096	0.978 0.903-1.059	0.578
<b>Sm</b>	1.182 1.111-1.257	<0.001	1.189 1.101-1.284	<0.001
<b>HBV</b>	0.752 0.707-0.799	<0.001	1.042 0.954-1.138	0.364
<b>HCV</b>	1.174 1.070-1.288	0.001	1.006 0.890-1.138	0.919
<b>Alc</b>	1.266 1.189-1.347	<0.001	1.034 0.952-1.123	0.429
<b>MELD</b>	1.073 1.068-1.077	<0.001	1.023 1.011-1.035	<0.001
<b>Child Pugh</b>				
<b>A</b>	1		1	
<b>B</b>	3.122 2.915-3.344	<0.001	1.616 1.460-1.789	<0.001
<b>C</b>	4.404 3.957-4.903	<0.001	1.530 1.044-2.242	0.029
<b>BCLC</b>				
<b>0</b>	1		1	
<b>A</b>	1.467 1.290-1.668	<0.001	1.254 1.092-1.439	0.001
<b>B</b>	3.327 2.883-3.839	<0.001	2.130 1.816-2.498	<0.001
<b>C</b>	5.410 4.804-6.093	<0.001	3.324 2.915-3.790	<0.001
<b>D</b>	11.776 10.191-13.607	<0.001	3.361 2.463-4.586	<0.001
<b>Tx</b>				
<b>Curative Tx</b>	1		1	
<b>Non-curative Tx</b>	3.840 3.512-4.198	<0.001	2.547 2.317-2.799	<0.001

- This trend persisted in the analysis stratified by Barcelona Clinic Liver Cancer (BCLC) staging and comparable patterns was observed in the curative and non-curative treatment cohorts.
- Among patients who received only conservative treatment, no statistical differences in survival rate by stage were observed in age groups 70-79 and ≥80 years.



# Results

Restricted cubic spline by adjusted COX regression analysis



- Restricted cubic splines analysis using adjusted Cox regression results identified the age of 70 years as the threshold at which the potential treatment benefits began to diminish

# Conclusion

- For patients diagnosed with HCC after their mid-70s, the potential for prognostic benefit attributable to the cancer stage or treatment modalities may be diminished relative to the younger age group.
- Age-based risk stratification may be necessary in the context of individual clinical scenarios, and further research is required to assess the optimal timing for terminating HCC surveillance.