Supplementary Materials

Immunotherapy in Hepatocellular Cancer Patients with Mild to Severe Liver Dysfunction: Adjunctive Role of the ALBI Grade


**Figure S1.** Dynamic changes in the ALBI grade from ICI commencement to discontinuation associated with improved OS in HCC patients.

**Figure S2.** The relationship between ALBI grade at discontinuation and PIOS within patients in CTP A functional class at ICI discontinuation.
Table S1. Distribution of Treatment-related adverse events (trAEs) according to Child Turcotte-Pugh (CTP) classification.

<table>
<thead>
<tr>
<th>trAE Class</th>
<th>trAE of Any Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CTP A</td>
</tr>
<tr>
<td>Dermatologic Toxicity</td>
<td>32 (10)</td>
</tr>
<tr>
<td>Diarrhoea/Colitis</td>
<td>23 (7)</td>
</tr>
<tr>
<td>Fatigue</td>
<td>47 (14)</td>
</tr>
<tr>
<td>Liver Toxicity</td>
<td>53 (16)</td>
</tr>
<tr>
<td>Endocrine Toxicity</td>
<td>20 (6)</td>
</tr>
<tr>
<td>Pneumotoxicity</td>
<td>12 (4)</td>
</tr>
<tr>
<td>Others</td>
<td>38 (12)</td>
</tr>
</tbody>
</table>

Table S2. Distribution of Treatment-related adverse events (trAEs) according to Albumin-bilirubin (ALBI) grade.

<table>
<thead>
<tr>
<th>trAE Class</th>
<th>trAE of Any Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ALBI 1</td>
</tr>
<tr>
<td>Dermatologic Toxicity</td>
<td>19 (6)</td>
</tr>
<tr>
<td>Diarrhoea/Colitis</td>
<td>13 (4)</td>
</tr>
<tr>
<td>Fatigue</td>
<td>23 (7)</td>
</tr>
<tr>
<td>Liver toxicity</td>
<td>27 (8)</td>
</tr>
<tr>
<td>Endocrine toxicity</td>
<td>10 (3)</td>
</tr>
<tr>
<td>Pneumotoxicity</td>
<td>6 (2)</td>
</tr>
<tr>
<td>Others</td>
<td>33 (10)</td>
</tr>
</tbody>
</table>

Table S3. The relationship between CTP class and trAEs in patients treated with ICI as monotherapy or combinations.

<table>
<thead>
<tr>
<th>ICPI Regimen</th>
<th>Child-Turcotte Pugh Class</th>
<th>No TrAE</th>
<th>TrAE Any grade</th>
<th>Total</th>
<th>Pearson X² (p Value)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monotherapy</td>
<td>CTP A</td>
<td>99</td>
<td>57%</td>
<td>75</td>
<td>174</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>43%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CTP B</td>
<td>40</td>
<td>66%</td>
<td>21</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>34%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CTP C</td>
<td>5</td>
<td>72%</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>28%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>144</td>
<td>60%</td>
<td>98</td>
<td>242</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>40%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Combination Therapy</td>
<td>CTP A</td>
<td>12</td>
<td>25%</td>
<td>36</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>75%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CTP B</td>
<td>2</td>
<td>66%</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>34%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>14</td>
<td>2%</td>
<td>37</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>72%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>CTP A</td>
<td>111</td>
<td>50%</td>
<td>111</td>
<td>222</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>50%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CTP B</td>
<td>42</td>
<td>66%</td>
<td>22</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>34%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CTP C</td>
<td>5</td>
<td>71%</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>29%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>158</td>
<td>54%</td>
<td>135</td>
<td>293</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>46%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5.76</td>
<td>(p = 0.06)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5.76</td>
<td>(p = 0.06)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5.76</td>
<td>(p = 0.06)</td>
<td></td>
</tr>
</tbody>
</table>
Table S4. The relationship between ALBI grade and trAEs in patients treated with ICI as monotherapy or combinations.

<table>
<thead>
<tr>
<th>ICPI Regimen</th>
<th>ALBI Grade</th>
<th>No TrAE</th>
<th>TrAE Any grade</th>
<th>Total</th>
<th>Pearson X² (p Value)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ALBI 1</td>
<td>N 35</td>
<td>34</td>
<td>69</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ALBI 2</td>
<td>N 86</td>
<td>54</td>
<td>140</td>
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<td></td>
<td>ALBI 3</td>
<td>N 22</td>
<td>9</td>
<td>31</td>
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</tr>
<tr>
<td></td>
<td>Total</td>
<td>N 143</td>
<td>97</td>
<td>240</td>
<td>4.11 (p = 0.12)</td>
</tr>
<tr>
<td>Monotherapy</td>
<td>ALBI 1</td>
<td>N 6</td>
<td>19</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ALBI 2</td>
<td>N 8</td>
<td>15</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ALBI 3</td>
<td>N 14</td>
<td>34</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>Combination Therapy</td>
<td>ALBI 1</td>
<td>N 41</td>
<td>53</td>
<td>94</td>
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<tr>
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<td>ALBI 2</td>
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<td>69</td>
<td>163</td>
<td>0.67 (p = 0.41)</td>
</tr>
<tr>
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<td>ALBI 3</td>
<td>N 22</td>
<td>9</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>ALBI 1</td>
<td>N 41</td>
<td>53</td>
<td>94</td>
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<tr>
<td></td>
<td>ALBI 2</td>
<td>N 94</td>
<td>69</td>
<td>163</td>
<td>8.54 (p = 0.01)</td>
</tr>
<tr>
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<td>N 22</td>
<td>9</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>N 157</td>
<td>131</td>
<td>288</td>
<td></td>
</tr>
</tbody>
</table>

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