**Supplementary Table 1: Summary of event and time to event in compensated cirrhosis**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | All | UDCA Responder | UDCA Partial Responder | *P Value* |
| **Event, N (%)** | 　 | 　 | 　 |  |
| Decompensation | 123 | 58 (20.2%) | 65 (30.4%) | *0.0089* |
| Liver cancer | 22 | 14 (4.9%) | 8 (3.7%) | *0.1665* |
| All cause Death | 202 | 105 (36.6%) | 97 (45.3%) | *0.0485* |
| Liver-related Death | 96 | 48 (16.7%) | 48 (22.4%) | *0.1085* |
| Liver-related Death or Transplantation | 100 | 49 (17.1%) | 51 (23.8%) | *0.0481* |

**Supplementary Table 2: Univariable and multivariable hazard ratios for the risk of hepatic decompensation and liver cancer**

|  |  |  |
| --- | --- | --- |
|   | Hepatic Decompensation | Liver Cancer |
| Number of events | 123 | 22 |
|  | Univariable | Multivariable | Univariable | Multivariable |
| Variable | HR (95%CI) | *P* *Value* | aHR (95%CI) | *P* *Value* | HR (95%CI) | *P* *Value* | aHR (95%CI) | *P* *Value* |
| **UDCA Responders** |  |  |  |  |  |  |  |  |
| No | REF |  | REF |  | REF |  | REF |  |
| Yes | 0.62 (0.43,0.90) | ***0.0109*** | 0.54 (0.31,0.95) | ***0.0331*** | 0.91 (0.33,2.47) | *0.8490* | 0.39 (0.06,2.55) | *0.3286* |
| **Gender** |   |  |   |  |  |  |  |  |
| Female | REF |  | REF |  | REF |  | REF |  |
| Male | 1.56 (0.97,2.53) | *0.0695* | 1.37 (0.46,1.93) | *0.6538* | 2.40 (0.54,10.61) | *0.2489* | 1.25 (0.20,7.97) | *0.8114* |
| **Age at Cirrhosis** | 1.01 (0.99,1.03) | *0.6098* | 1.02 (0.99,1.04) | *0.2879* | 1.07 (1.02,1.12) | ***0.0029*** | 1.09 (1.02,1.17) | ***0.0078*** |
| **Race / Ethnicity** |  |  |  |  |  |  |  |  |
| White | REF |  | REF |  | REF |  | REF |  |
| Black | 0.67 (0.42,1.08) | *0.0979* | 0.71 (0.29,1.71) | *0.4422* | 1.05 (0.14,7.61) | *0.9630* | 6.56 (0.38,11.92) | *0.1938* |
| Other | 1.69 (1.04,2.77) | ***0.0362*** | 1.79 (0.97,3.30) | *0.0615* | 1.71 (0.48,6.08) | *0.4046* | 1.60 (0.33,7.76) | *0.5617* |
| Hispanic/Latino | 0.86 (0.30,2.46) | *0.7704* | 0.51 (0.17,1.53) | *0.2257* | - | *-* | - | *-* |
| Unknown | 0.92 (0.31,2.70) | *0.8714* | 0.93 (0.41,2.09) | *0.8547* | - | *-* | - | *-* |
| **BMI** |  |  |  |  |  |  |  |  |
| Normal Weight (18.5 to 25) | REF |  | REF |  | REF |  | REF |  |
| Underweight (less than 18.5) | 1.23 (0.55,2.77) | *0.6189* | 3.51 (1.29,9.55) | ***0.0138*** | 1.68 (0.22,12.65) | *0.6130* | 6.31 (0.39,10.57) | *0.1967* |
| Overweight (25 to 30) | 0.99 (0.62,1.57) | *0.9669* | 1.21 (0.67,2.18) | *0.5216* | 0.59 (0.21,1.68) | *0.3189* | 0.34 (0.09,1.32) | *0.1207* |
| Obese (more than 30) | 1.18 (0.71,1.96) | *0.5345* | 1.19 (0.62,2.27) | *0.6057* | 0.24 (0.05,1.17) | *0.0767* | 0.17 (0.04,0.82) | ***0.0272*** |
| **Diabetes** |  |  |  |  |  |  |  |  |
| No | REF |  | REF |  | REF |  | REF |  |
| Yes | 2.12 (1.37,3.30) | ***0.0008*** | 2.47 (1.54,3.95) | ***0.0002*** | 1.33 (0.47,3.77) | *0.5911* | 1.57 (0.18,1.81) | *0.3380* |
| **Tobacco Use** |  |  |  |  |  |  |  |  |
| Never Smoker | REF |  | REF |  | REF |  | REF |  |
| Current Smoker | 1.05 (0.68,1.63) | *0.8225* | 0.89 (0.43,1.12) | *0.1292* | 2.31 (0.56,9.44) | *0.2456* | 4.70 (0.96,23.06) | *0.0564* |
| Former Smoker | 0.88 (0.56,1.37) | *0.5640* | 0.78 (0.45,1.34) | *0.3636* | 2.34 (0.63,8.74) | *0.2070* | 1.67 (0.39,7.14) | *0.4906* |
| Unknown | - | *-* | - | *-* | 11.72 (1.13,21.42) | ***0.0391*** | 7.19 (0.38,15.57) | *0.1879* |
| **AUDIT-C Score** |  |  |  |  |  |  |  |  |
| Low | REF |  | REF |  | REF |  | REF |  |
| High | 1.05 (0.57,1.93) | *0.8771* | 1.23 (0.49,3.10) | *0.6601* | 1.11 (0.15,8.50) | *0.9209* | 1.57 (0.23,10.92) | *0.6500* |
| **CTP Score** |  |  |  |  |  |  |  |  |
| CTP A5 | REF |  | REF |  | REF |  | REF |  |
| CTP A6 | 2.23 (1.21,4.11) | ***0.0105*** | 2.67 (1.29,5.52) | ***0.0081*** | 1.56 (0.36,6.79) | *0.5536* | 2.73 (0.22,34.68) | *0.4379* |
| **AMA** |  |  |  |  |  |  |  |  |
| Yes | REF |  | REF |  | REF |  | REF |  |
| No | 1.17 (0.61,2.23) | *0.6339* | 1.77 (0.92,3.40) | *0.0893* | 2.00 (0.27,14.73) | *0.4980* | 2.27 (0.17,30.53) | *0.5376* |
| **Aspartate Aminotransferase** | 1.06(1.02,1.12) | ***0.0440*** | 1.018(0.95,1.23) | *0.2467* | 1.04 (0.96,1.12) | *0.3374* | 0.94 (0.70,1.28) | *0.6992* |
| **Alanine Aminotransferase** | 1.01(0.96,1.05) | *0.8418* | 0.94 (0.83,1.05) | *0.2580* | 1.02(0.93,1.11) | *0.6761* | 1.36 (0.94,1.96) | *0.1059* |
| **Alkaline Phosphatase** | 1.07(0.99,1.14) | *0.0697* | 1.00 (0.98,1.02) | *0.9661* | 0.98 (0.95,1.01) | *0.1470* | 0.91 (0.83,1.04) | *0.0602* |
| **Total Bilirubin** | 1.51 (1.16,1.95) | ***0.0020*** | 0.96 (0.62,1.47) | *0.8355* | 1.23 (0.99,1.52) | *0.0633* | 2.37 (1.04,5.40) | ***0.0397*** |
| **Platelet Count** |  |  |  |  |  |  |  |  |
| <=50 | REF |  | REF |  | REF |  | REF |  |
| 50 -100 | 0.19 (0.08,0.44) | ***0.0001*** | 0.45 (0.15,1.40) | *0.1694* | 0.65 (0.08,5.44) | *0.6903* | 0.42 (0.03,7.12) | *0.5490* |
| 100 - 150 | 0.12 (0.05,0.26) | ***<.0001*** | 0.13 (0.04,0.43) | ***0.0008*** | 0.29 (0.03,2.49) | *0.2569* | 0.16 (0.01,3.27) | *0.2357* |
| >150 | 0.11 (0.05,0.23) | ***<.0001*** | 0.13 (0.04,0.46) | ***0.0014*** | 0.09 (0.01,0.76) | ***0.0267*** | 0.04 (0.01,0.94) | *0.0460* |
| **MELD-Na Score** | 1.15 (1.07,1.24) | ***<.0001*** | 1.12 (1.02,1.22) | ***0.0178*** | 1.16 (0.90,1.50) | *0.2558* | 0.66 (0.34,1.26) | *0.2033* |

* *UDCA: Ursodeoxycholic Acid; BMI: Body Mass Index; AUDIT-C: Alcohol Use Disorders Identification Test – Concise; CTP: Child-Turcotte-Pugh; MELD-Na: Model for End-stage Liver Disease-Sodium Score; AMA: Antimitochondrial Antibody*

**Supplementary Table 3: Sensitivity analysis - Univariable and multivariable hazard ratios for the risk of death or transplantation and liver-related death or transplantation in patients with portal hypertension**

|  |  |  |
| --- | --- | --- |
|   | Death or Transplantation | Liver-related Death or Transplantation |
| Number of events | 206 | 100 |
|   | Univariable | Multivariable | Univariable | Multivariable |
| Variable | HR (95%CI) | *P* *Value* | aHR (95%CI) | *P* *Value* | HR (95%CI) | *P* *Value* | aHR (95%CI) | *P* *Value* |
| **UDCA Responders** |  |  |  |  |  |  |  |  |
| No | REF |  | REF |  | REF |  | REF |  |
| Yes | 0.63 (0.44,0.91) | ***0.0139*** | 0.49 (0.29,0.84) | ***0.0090*** | 0.51 (0.32,0.82) | ***0.0048*** | 0.21 (0.09,0.49) | ***0.0003*** |
| **Gender** |   |  |   |  |   |  |   |  |
| Female | REF |  | REF |  | REF |  | REF |  |
| Male | 1.26 (0.72,2.19) | *0.4165* | 1.91 (0.86,4.25) | *0.1117* | 1.82 (0.44,2.50) | *0.5111* | 1.57 (0.17,2.88) | *0.3508* |
| **Age at Cirrhosis** | 1.01 (0.99,1.03) | *0.4746* | 1.01 (0.99,1.04) | *0.3112* | 1.02 (0.99,1.05) | *0.1470* | 1.04 (0.99,1.09) | *0.1344* |
| **Race / Ethnicity** |  |  |  |  |  |  |  |  |
| White | REF |  | REF |  | REF |  | REF |  |
| Black | 1.50 (0.56,4.06) | *0.4212* | 1.66 (0.67,4.09) | *0.2710* | 1.08 (0.45,2.59) | *0.8672* | 1.72 (0.53,5.52) | *0.3659* |
| Other | 1.90 (1.01,3.58) | ***0.0460*** | 1.87 (0.96,3.63) | *0.0642* | 1.47 (0.73,2.96) | *0.2760* | 1.20 (0.45,3.20) | *0.7185* |
| Hispanic/Latino | 2.18 (1.25,3.79) | ***0.0060*** | 1.28 (0.22,7.40) | *0.7794* | 2.32 (1.18,4.56) | ***0.0152*** | 3.72 (0.42,33.23) | *0.2393* |
| Unknown | 2.01 (1.07,3.79) | ***0.0303*** | 1.07 (0.41,2.77) | *0.8884* | 2.22 (1.06,4.65) | ***0.0355*** | 0.88 (0.28,2.81) | *0.8301* |
| **BMI** |  |  |  |  |  |  |  |  |
| Normal Weight (18.5 to 25) | REF |  | REF |  | REF |  | REF |  |
| Underweight (less than 18.5) | 1.54 (0.65,3.67) | *0.3292* | 0.69 (0.06,8.72) | *0.7746* | 0.84 (0.55,1.28) | *0.4171* | 0.05 (0.01,0.60) | ***0.0176*** |
| Overweight (25 to 30) | 1.02 (0.64,1.62) | *0.9416* | 0.85 (0.54,1.35) | *0.4980* | 0.70 (0.42,1.17) | *0.1700* | 0.60 (0.30,1.21) | *0.1530* |
| Obese (more than 30) | 0.76 (0.45,1.28) | *0.3038* | 0.78 (0.40,1.51) | *0.4555* | 0.47 (0.25,0.90) | ***0.0221*** | 0.51 (0.18,1.46) | *0.2076* |
| **Diabetes** |  |  |  |  |  |  |  |  |
| No | REF |  | REF |  | REF |  | REF |  |
| Yes | 1.16 (0.8,1.66) | *0.4353* | 1.20 (0.79,1.82) | *0.3887* | 1.14 (0.72,1.79) | *0.5835* | 1.21 (0.72,2.03) | *0.4694* |
| **Tobacco Use** |  |  |  |  |  |  |  |  |
| Never Smoker | REF |  | REF |  | REF |  | REF |  |
| Current Smoker | 1.07 (0.71,1.60) | *0.7508* | 1.23 (0.73,2.07) | *0.4303* | 1.21 (0.73,2.02) | *0.4573* | 1.64 (0.63,4.30) | *0.3147* |
| Former Smoker | 0.70 (0.46,1.06) | *0.0897* | 0.67 (0.38,1.17) | *0.1612* | 0.81 (0.50,1.33) | *0.4040* | 0.74 (0.37,1.51) | *0.4141* |
| Unknown | 3.80 (2.16,6.69) | ***<.0001*** | 2.60 (1.04,6.53) | ***0.0413*** | 5.98 (3.16,11.3) | ***<.0001*** | 13.41 (4.58,39.29) | ***<.0001*** |
| **AUDIT-C Score** |  |  |  |  |  |  |  |  |
| Low | REF |  | REF |  | REF |  | REF |  |
| High | 1.85 (0.50,2.44) | *0.5348* | 1.25 (0.54,2.87) | *0.6061* | 1.73 (0.41,3.29) | *0.2822* | 1.61 (0.19,2.98) | *0.4127* |
| **CTP Score** |  |  |  |  |  |  |  |  |
| CTP A5 | REF |  | REF |  | REF |  | REF |  |
| CTP A6 | 1.76 (0.93,3.33) | *0.0817* | 1.48 (0.51,4.34) | *0.4756* | 1.78 (0.84,3.80) | *0.1335* | 1.55 (0.06,4.77) | *0.5904* |
| **AMA** |  |  |  |  |  |  |  |  |
| Yes | REF |  | REF |  | REF |  | REF |  |
| No | 1.99 (1.24,3.20) | ***0.0047*** | 1.83 (0.87,3.88) | *0.1139* | 2.16 (1.19,3.91) | ***0.0110*** | 1.24 (0.39,3.95) | *0.7135* |
| **Aspartate Aminotransferase** | 1.07 (0.94,1.08) | *0.8506* | 1.05 (0.89,1.24) | *0.5483* | 1.04 (0.95,1.13) | *0.3896* | 1.17(0.94,1.45) | *0.1608* |
| **Alanine Aminotransferase** | 0.96 (0.93,0.99) | ***0.0194*** | 0.89 (0.78,1.13) | *0.0759* | 0.96 (0.93,1.02) | *0.0606* | 0.85 (0.69,1.05) | *0.1339* |
| **Alkaline Phosphatase** | 1.00(0.93,1.07) | *0.9946* | 1.00 (0.98,1.02) | *0.9798* | 1.00(0.99,1.01) | *0.9524* | 0.98 (0.95,1.06) | *0.3089* |
| **Total Bilirubin** | 1.29 (0.92,1.81) | *0.1362* | 1.27 (0.74,2.20) | *0.3888* | 1.55 (1.02,2.37) | ***0.0408*** | 1.42 (0.50,4.02) | *0.5073* |
| **Platelet Count** |  |  |  |  |  |  |  |  |
| <=50 | REF |  | REF |  | REF |  | REF |  |
| 50 -100 | 1.07 (0.40,2.88) | *0.8929* | 1.17 (0.31,4.33) | *0.8195* | 1.56 (0.58,4.21) | *0.3837* | 2.53 (0.50,12.75) | *0.2604* |
| 100 - 150 | 0.98 (0.38,2.52) | *0.9577* | 1.38 (0.35,5.44) | *0.6432* | 1.09 (0.39,3.01) | *0.8761* | 1.82 (0.32,10.42) | *0.5013* |
| >150 | 0.55 (0.22,1.40) | *0.2127* | 0.90 (0.24,3.44) | *0.8767* | 0.61 (0.23,1.63) | *0.3211* | 1.39 (0.23,8.44) | *0.7228* |
| **MELD-Na Score** | 1.07 (0.99,1.15) | *0.0735* | 1.01 (0.92,1.12) | *0.7949* | 1.07 (0.98,1.16) | *0.1411* | 1.17 (0.97,1.40) | *0.1018* |

* *UDCA: Ursodeoxycholic Acid; BMI: Body Mass Index; AUDIT-C: Alcohol Use Disorders Identification Test – Concise; CTP: Child-Turcotte-Pugh; MELD-Na: Model for End-stage Liver Disease-Sodium Score; AMA: Antimitochondrial Antibody*

**Supplementary Table 4: Sensitivity analysis - Univariable and multivariable hazard ratios for the risk of hepatic decompensation and liver cancer for patients with portal hypertension**

|  |  |  |
| --- | --- | --- |
|   | Hepatic Decompensation | Liver Cancer |
| Number of events | 83 | 14 |
|  | Univariable | Multivariable | Univariable | Multivariable |
| Variable | HR (95%CI) | *P* *Value* | aHR (95%CI) | *P* *Value* | HR (95%CI) | *P* *Value* | aHR (95%CI) | *P* *Value* |
| **UDCA Responders** |  |  |  |  |  |  |  |  |
| No | REF |  | REF |  | REF |  | REF |  |
| Yes | 0.61 (0.39,0.95) | ***0.0282*** | 0.95 (0.46,1.93) | *0.8770* | 0.16 (0.40,3.39) | *0.7868* | 0.28 (0.02,4.15) | *0.3572* |
| **Gender** |   |  |   |  |  |  |  |  |
| Female | REF |  | REF |  | REF |  | REF |  |
| Male | 1.53 (0.78,3.03) | *0.2173* | 1.52 (0.68,3.37) | *0.3079* | 3.07 (0.39,8.31) | *0.2886* | 3.71 (0.06,9.11) | *0.7921* |
| **Age at Cirrhosis** | 1.01 (0.98,1.03) | *0.6398* | 1.03 (0.99,1.07) | *0.0579* | 1.06 (1.01,1.11) | ***0.0147*** | 1.09 (1.03,1.14) | ***0.0011*** |
| **Race / Ethnicity** |  |  |  |  |  |  |  |  |
| White | REF |  | REF |  | REF |  | REF |  |
| Black | 0.46 (0.33,0.64) | ***<.0001*** | 0.21 (0.04,1.01) | *0.0520* | 1.51 (0.24,9.52) | *0.6630* | 5.57 (0.24,12.18) | *0.2830* |
| Other | 1.42 (0.82,2.46) | *0.2096* | 2.17 (0.94,5.01) | *0.0703* | 1.38 (0.30,6.39) | *0.6789* | 2.71 (0.30,14.28) | *0.3742* |
| Hispanic/Latino | 1.03 (0.27,3.87) | *0.9660* | 0.18 (0.05,0.63) | ***0.0073*** | - | - | - | - |
| Unknown | 0.91 (0.34,2.47) | *0.8531* | 0.77 (0.31,1.89) | *0.5679* | - | - | - | - |
| **BMI** |  |  |  |  |  |  |  |  |
| Normal Weight (18.5 to 25) | REF |  | REF |  | REF |  | REF |  |
| Underweight (less than 18.5) | 3.49 (1.93,6.30) | ***<.0001*** | 18.21 (3.84,86.41) | ***0.0003*** | - | - | - | - |
| Overweight (25 to 30) | 1.12 (0.65,1.91) | *0.6929* | 1.62 (0.85,3.05) | *0.1406* | 0.65 (0.22,2.00) | *0.4560* | 0.36 (0.09,1.56) | *0.1733* |
| Obese (more than 30) | 1.21 (0.67,2.20) | *0.5334* | 1.69 (0.77,3.70) | *0.1889* | 0.36 (0.07,1.86) | *0.2212* | 0.20 (0.03,1.40) | *0.1063* |
| **Diabetes** |  |  |  |  |  |  |  |  |
| No | REF |  | REF |  | REF |  | REF |  |
| Yes | 2.10 (1.27,3.47) | ***0.0037*** | 2.42 (1.27,4.63) | ***0.0074*** | 2.16 (0.24,4.39) | *0.6348* | 2.26 (0.46,11.10) | *0.3163* |
| **Tobacco Use** |  |  |  |  |  |  |  |  |
| Never Smoker | REF |  | REF |  | REF |  | REF |  |
| Current Smoker | 0.96 (0.59,1.55) | *0.8617* | 0.40 (0.25,0.65) | ***0.0001*** | 1.66 (0.35,7.96) | *0.5285* | 2.77 (0.35,22.04) | *0.3353* |
| Former Smoker | 0.87 (0.53,1.43) | *0.5733* | 0.67 (0.35,1.28) | *0.2285* | 1.97 (0.53,7.42) | *0.3148* | 1.43 (0.38,5.34) | *0.5955* |
| Unknown | - | *-* | - | *-* | 12.97 (1.29,30.54) | ***0.0296*** | 10.59 (0.69,33.00) | *0.0907* |
| **AUDIT-C Score** |  |  |  |  |  |  |  |  |
| Low | REF |  | REF |  | REF |  | REF |  |
| High | 1.83 (0.44,2.57) | *0.5567* | 1.93 (0.45,2.95) | *0.8524* | 1.19 (0.15,9.38) | *0.8676* | 4.23 (0.44,41.03) | *0.2135* |
| **CTP Score** |  |  |  |  |  |  |  |  |
| CTP A5 | REF |  | REF |  | REF |  | REF |  |
| CTP A6 | 2.98 (1.37,6.47) | ***0.0059*** | 3.01 (1.14,7.98) | ***0.0267*** | 1.03 (0.11,6.33) | *0.8584* | 1.04 (0.08,13.28) | *0.9738* |
| **AMA** |  |  |  |  |  |  |  |  |
| Yes | REF |  | REF |  | REF |  | REF |  |
| No | 1.79 (0.80,4.00) | *0.1552* | 2.68 (1.22,5.86) | ***0.0137*** | 1.62 (0.09,4.54) | *0.6396* | 1.36 (0.02,5.87) | *0.4692* |
| **Aspartate Aminotransferase** | 1.07 (0.99,1.15) | *0.0722* | 1.17 (0.96,1.42) | *0.1317* | 1.03(0.96,1.11) | *0.4055* | 1.07 (0.73,1.56) | *0.7480* |
| **Alanine Aminotransferase** | 0.99 (0.94,1.05) | *0.8301* | 0.86 (0.74,0.99) | ***0.0346*** | 1.03 (0.94,1.14) | *0.5070* | 1.35 (0.95,1.93) | *0.0947* |
| **Alkaline Phosphatase** | 1.07 (0.99,1.16) | *0.0953* | 1.02 (0.99,1.04) | *0.1866* | 0.97 (0.95,0.99) | ***0.0480*** | 0.90 (0.79,1.02) | *0.0998* |
| **Total Bilirubin** | 1.68 (1.10,2.57) | ***0.0169*** | 0.92 (0.51,1.68) | *0.7859* | 0.89 (0.44,1.82) | *0.7504* | 0.90 (0.50,1.54) | *0.1956* |
| **Platelet Count** |  |  |  |  |  |  |  |  |
| <=50 | REF |  | REF |  | REF |  | REF |  |
| 50 -100 | 0.21 (0.10,0.47) | ***0.0002*** | 0.51 (0.13,2.09) | *0.3501* | 0.67 (0.08,5.85) | *0.7199* | 0.38 (0.02,6.03) | *0.4953* |
| 100 - 150 | 0.14 (0.07,0.29) | ***<.0001*** | 0.15 (0.04,0.60) | ***0.0075*** | 0.30 (0.03,2.68) | *0.2787* | 0.11 (0.01,1.66) | *0.1112* |
| >150 | 0.13 (0.06,0.27) | ***<.0001*** | 0.21 (0.04,1.11) | *0.0658* | 0.22 (0.02,2.34) | *0.2100* | 0.05 (0.01,1.68) | *0.0956* |
| **MELD-Na Score** | 1.16 (1.05,1.28) | ***0.0036*** | 1.21 (1.06,1.38) | ***0.0056*** | 0.71 (0.43,1.17) | *0.1787* | 0.41 (0.17,0.98) | ***0.0438*** |

* *UDCA: Ursodeoxycholic Acid; BMI: Body Mass Index; AUDIT-C: Alcohol Use Disorders Identification Test – Concise; CTP: Child-Turcotte-Pugh; MELD-Na: Model for End-stage Liver Disease-Sodium Score; AMA: Antimitochondrial Antibody*