**Supplemental material**

**Section 1- Somatic health of AUD patients**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Patient** | **Age** | **Gender** | **Health Status** | | | |
|  | | | **Hypertension** | **Steatosis** | **Hepatitis** | **Cirrhosis** |
| 1 | 46 | Female |  | **X** |  | **X** |
| 2 | 73 | Male | **X** | **X** |  |  |
| 3 | 54 | Male |  | **X** |  | **X** |
| 4 | 49 | Female |  | **X** |  |  |
| 5 | 47 | Male |  | **X** |  |  |
| 6 | 40 | Male |  |  |  |  |
| 7 | 26 | Female |  |  |  |  |
| 8 | 37 | Male |  |  | **X** | **X** |
| 9 | 66 | Female |  | **X** |  | **X** |
| 10 | 44 | Male |  | **X** |  | **X** |
| 11 | 47 | Male |  | **X** |  | **X** |
| 12 | 48 | Male |  | **X** |  |  |
| 13 | 67 | Male |  |  |  |  |
| 14 | 53 | Male |  | **X** |  | **X** |
| 15 | 66 | Male |  |  | **X** | **X** |
| 16 | 48 | Female |  | **X** |  |  |
| 17 | 46 | Male |  | **X** | **X** | **X** |
| 18 | 69 | Male |  |  |  |  |
| 19 | 49 | Male | **X** |  |  | **X** |
| 20 | 74 | Female | **X** | **X** |  | **X** |

**Table 1a.** Co-morbid somatic conditions of Alcohol Use Disorder (AUD) patients (N=20) at time of testing. A majority of AUD patients were diagnosed with moderate to severe alcohol-related liver disease (ARLD), while a minority were diagnosed with any cardiovascular conditions. Conditions reported (from left to right): hypertension (3 patients), alcoholic steatosis i.e., fatty liver (13 patients), alcoholic hepatitis (3 patients), and alcoholic cirrhosis (11 patients).

**Section 2- Demographic and psychiatric factors for the larger HC sample (N=35)**

The AUD group was significantly older than the larger HC group, while the HC group had undergone more years of formal education. As expected, the AUD group showed greater alcohol use frequency and severity, as well as greater severity of psychiatric factors depression, anxiety, negative urgency impulsivity, and a statistical trend toward greater positive urgency impulsivity. Lastly, the AUD group more quickly discounted delayed rewards (Table 1a).

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Factor** | | **AUD Mean(SD)** | **HC Mean(SD)** | **Test** | **Statistic** | **Df** | ***P*-Value** | **CIs** |
| Age | | 52.5(12.8) | 39(14.1) | Mann-Whitney | 536.0 | N/A | .001\*\* | 5.8-21.2 |
| Gender | | .3(.47) | .31(.47) | Mann-Whitney | 345.0 | N/A | .92 |  |
| Years of Education | | 15(3.28) | 17(3.39) | Student’s | -2.15 | 1,53 | .04\* | -3.9 - -0.1 |
| Alcohol Use | | 15(10.54) | 6.3(5.1) | Welch’s | 4.13 | 1,24.1 | .002\*\* | 3.5-13.9 |
| Nicotine Use | | 1(1.78) | 0.3(0.96) | Welch’s | 1.6 | 1,25.5 | .12 |  |
| Depression | | 11.4(9.5) | 6(6.32) | Welch’s | 2.26 | 1,28.2 | .03\* | 0.5-10.2 |
| Anxiety | | 22.18(8.2) | 17.7(5.45) | Welch’s | 2.19 | 1,28.8 | .04\* | 0.3-8.7 |
| Impulsivity | SS | 28.4(8) | 30.1(10.2) | Mann-Whitney | 258.0 | N/A | .11 |  |
| NU | 28.4(7.72) | 22.9(7.1) | Student’s | 2.66 | 1,53 | .01\* | 1.4-9.6 |
| PU | 27.6(6.78) | 24(6.4) | Student’s | 1.95 | 1,53 | .06 |  |
| LOPre | 22.2(5.04) | 20.9(6.46) | Mann-Whitney | .67 | N/A | .77 |  |
| LOPer | 21.3(5.58) | 18.6(6.06) | Mann-Whitney | .36 | N/A | .16 |  |
| Delay Discounting | | 0.03(0.04) | 0.005(0.005) | Welch’s | 2.57 | 1,11.3 | .03\* | 0.004-0.05 |

**Table 2a.** Demographic and psychiatric factors between Alcohol Use Disorder (AUD) and the larger (N=35) healthy control (HC) groups. Factor=type of demographic or psychiatric factor under evaluation (from top to bottom: age, gender, years of education, alcohol use [AUDIT], nicotine use [Fagerström], depression [BDI-II], anxiety [STAI], delay discounting [MCQ], impulsivity [UPPS-P] with subscales sensation-seeking [SS], negative urgency [NU], positive urgency [PU], lack of premeditation [LOPre], and lack of perseveration [LOPer]); AUD Mean(SD)=the mean and standard deviation in the AUD group by factor; HC Mean(SD)=the mean and standard deviation in the HC group by factor; Test=type of t-test used according to statistical assumptions met; Statistic=test statistic; Df= degrees of freedom; *P*-Value=significance level of test (asterisks by a *P*-value indicate statistical significance; *P<*.05\*, *P<*.005\*\*); CIs=confidence intervals of the mean difference for each statistically significant finding.

**Section 3- SST performance of the larger HC sample (N=35) as compared to AUD group**

For the larger HC group, the average SSRT (157.3±54.4) in the IFC+4 condition was significantly lower than the average SSRT (173.2±48.4) in the IFC+100 condition, t(34)=-2.82, *P*=.008, CIs:-0.82- -0.12. Between-groups, the HC group (-15.9±33.4) as compared to the AUD group (14.5±54.7) showed a significant facilitation in SST performance, t(53)=2.56, *P*=.01, CIs: 6.61-54.16.

**Section 4- SST performance of the abstinent AUD group (N=15) as compared to the HC group**

**Section 4.1- Within- and between- group analyses of the abstinent AUD group between cPAS conditions**

In the abstinent AUD group, there was no significant difference in SST performance between IFC+4 (196.2±64.52) and IFC+100 (180.3±69.3) conditions (*P>*.05). The HC group (-21±31.2) as compared to the abstinent AUD group (15.87±62) showed a significant facilitation in SST performance in the IFC+4 condition, t(33)=-2.31, *P*=.03, CIs: -1.48- -0.09).

**Section 4.2- Stepwise logistic regression of individual improvement rates between abstinent AUD group (N=15) and HC group**

Fifteen of 20 (75%) HC compared to 4 of 15 (26.7%) abstinent AUD improved SST performance in the experimental condition. A stepwise logistic regression model using observed SSRT performance improvement in the IFC+4 condition (i.e., yes=1/no=0) as a dependent variable and group as a fixed factor was statistically significant (*X*2 [33, N=35]=6.66, *P*=.01); this model explained 23.1% (Nagelkerke R2) of the variance in SSRT performance improvement between-groups and correctly classified 71.4% of cases. Overall, HC group designation was associated with more than twice higher likelihood of SSRT improvement than abstinent AUD group designation in the IFC+4 cPAS condition (HCs: 69% vs. AUD: 12.8%; HC odds ratio: 2.33, AUD odds ratio: 0.156; *P*=.02; CIs: -3.35- -0.34, Figure 3).