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Supplementary Information for

Neonatal CSF vasopressin concentration predicts later medical record diagnoses of autism spectrum disorder

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**This PDF file includes:**

Human-readable SAS code, both for the data and the analysis. Analyses are reported here in the same order as reported in the results section of the main article.

**Analysis 1: ASD cases show lower neonatal CSF AVP concentration compared to matched controls (Figure 2a)**

```
DATA OztanData1; INPUT Match &$16. Simple_group &$16. AVP_level_pg_mL_  
inv_matchvarAVP; Lines;
```

```
Match01 Control 8.958 0.00280196  
Match01 Autism 46.527 0.00280196  
Match01 Control 24.263 0.00280196  
Match02 Control 57.228 0.00146583  
Match02 Autism 31.234 0.00146583  
Match02 Control 83.472 0.00146583  
Match03 Control 15.421 0.001320211  
Match03 Autism 65.447 0.001320211  
Match03 Control 20.549 0.001320211  
Match04 Control 32.304 0.010817655  
Match04 Autism 18.693 0.010817655  
Match04 Control 37.262 0.010817655  
Match06 Control 53.111 0.008519635  
Match06 Autism 38.229 0.008519635  
Match06 Control 59.309 0.008519635  
Match08 Control 47.67 0.009025619  
Match08 Autism 31.319 0.009025619  
Match08 Control 50.978 0.009025619  
Match09 Control 35.579 0.017047458  
Match09 Autism 29.988 0.017047458  
Match09 Control 45.134 0.017047458  
Match10 Control 46.178 0.059266391  
Match10 Autism 37.99 0.059266391  
Match10 Control 41.504 0.059266391  
Match11 Autism 34.486 0.002279145  
Match11 Control 64.109 0.002279145
```

```
;  
RUN;
```

```
PROC GLM DATA=OztanData1;  
WEIGHT inv_matchvarAVP;  
CLASS Match Simple_group;  
MODEL AVP_level_pg_mL_ = Simple_group Match / SS3 effectsize;  
LSMEANS Simple_group/ stderr;  
RUN;
```

**Analysis 2: Analysis 1 repeated using within-match normalized neonatal CSF AVP values (Figure 2b)**

**DATA** OztanData2; **INPUT** Simple\_group &\$16. AVP\_Zscore; **Lines**;

Control -0.932935992  
Autism 1.055724159  
Control -0.122788168  
Control -0.003190513  
Autism -0.998400926  
Control 1.001591439  
Control -0.668001539  
Autism 1.149678683  
Control -0.481677144  
Control 0.299993619  
Autism -1.115658692  
Control 0.815665073  
Control 0.267183142  
Autism -1.106453265  
Control 0.839270123  
Control 0.413042498  
Autism -1.140355775  
Control 0.727313276  
Control -0.172521097  
Autism -0.902515135  
Control 1.075036233  
Control 1.043737992  
Autism -0.949605192  
Control -0.0941328  
Autism -0.707106781  
Control 0.707106781

;

**RUN**;

**PROC GLM** DATA=OztanData2 ALPHA=0.05;

**CLASS** Simple\_group;

**MODEL** AVP\_Zscore = Simple\_group / SS3 effectsize;

**LSMEANS** Simple\_group/ stderr;

**RUN**;

**Analysis 3: Analysis 2 repeated excluding matches in which ASD cases had comorbid ADHD (Figure 2b)**

```
DATA OztanData3; INPUT Simple_group &$16. AVP_Zscore; Lines;  
Control -0.003190513  
Autism -0.998400926  
Control 1.001591439  
Control 0.299993619  
Autism -1.115658692  
Control 0.815665073  
Control 0.267183142  
Autism -1.106453265  
Control 0.839270123  
Control 1.043737992  
Autism -0.949605192  
Control -0.0941328  
Autism -0.707106781  
Control 0.707106781  
;  
RUN;  
  
PROC GLM DATA=OztanData3;  
CLASS Simple_group;  
MODEL AVP_Zscore = Simple_group / SS3 effectsize;  
LSMEANS Simple_group/ stderr;  
RUN;
```

**Analysis 4: ASD cases do not differ in neonatal CSF OXT concentration from matched controls (Figure 2a)**

```
DATA OztanData4; INPUT Match &$16. Simple_group &$16. OXT_level_pg_mL_  
inv_matchvarOXT; Lines;
```

```
Match01 Control 70.538 0.002862585  
Match01 Autism 52.084 0.002862585  
Match01 Control 89.464 0.002862585  
Match02 Control 47.035 0.005767567  
Match02 Autism 67.617 0.005767567  
Match02 Control 43.098 0.005767567  
Match03 Control 90.928 0.000894954  
Match03 Autism 47.974 0.000894954  
Match03 Control 25.085 0.000894954  
Match04 Control 47.735 0.000992359  
Match04 Autism 28.839 0.000992359  
Match04 Control 90.778 0.000992359  
Match06 Control 117.579 0.000487932  
Match06 Autism 129.085 0.000487932  
Match06 Control 45.556 0.000487932  
Match09 Control 52.471 0.001408738  
Match09 Autism 35.921 0.001408738  
Match09 Control 88.061 0.001408738
```

```
;
```

```
RUN;
```

```
PROC GLM DATA=OztanData4 ;  
WEIGHT inv_matchvarOXT;  
CLASS Match Simple_group;  
MODEL OXT_level_pg_mL_ = Simple_group Match / SS3 effectsize;  
LSMEANS Simple_group/ stderr;  
RUN;
```

**Analysis 5: Analysis 4 repeated using within-match normalized neonatal CSF OXT values**

**DATA** OztanData5; **INPUT** Simple\_group &\$16. OXT\_Zscore; **Lines**;

Control -0.008417825

Autism -0.995764515

Control 1.00418234

Control -0.421365389

Autism 1.141724265

Control -0.720358877

Control 1.084915941

Autism -0.200086752

Control -0.884829189

Control -0.253557439

Autism -0.848814161

Control 1.1023716

Control 0.445590379

Autism 0.699748528

Control -1.145338907

Control -0.238210476

Autism -0.859384326

Control 1.097594802

;

**RUN**;

**PROC GLM** DATA=OztanData5;

**CLASS** Simple\_group;

**MODEL** OXT\_Zscore = Simple\_group / **SS3** effectsize;

**LSMEANS** Simple\_group/ **stderr**;

**RUN**;

**Analysis 6: Neonatal AVP concentration, normalized within match, predicts a later ASD diagnosis (Figure 2c)**

**DATA** OztanData6; **INPUT** Simple\_group & \$16. AVP\_Zscore; **Lines**;

Control -0.932935992  
Autism 1.055724159  
Control -0.122788168  
Control -0.003190513  
Autism -0.998400926  
Control 1.001591439  
Control -0.668001539  
Autism 1.149678683  
Control -0.481677144  
Control 0.299993619  
Autism -1.115658692  
Control 0.815665073  
Control 0.267183142  
Autism -1.106453265  
Control 0.839270123  
Control 0.413042498  
Autism -1.140355775  
Control 0.727313276  
Control -0.172521097  
Autism -0.902515135  
Control 1.075036233  
Control 1.043737992  
Autism -0.949605192  
Control -0.0941328  
Autism -0.707106781  
Control 0.707106781

;

**RUN**;

**PROC GENMOD** DATA=OztanData6 ;

**MODEL** Simple\_group = AVP\_Zscore/ **DIST**=BINOMIAL **LINK**=LOGIT **TYPE3**

**SCALE**=PEARSON;

**ESTIMATE** "Range Odds Ratio" AVP\_Zscore **2.290034458**/ **EXP**;

**RUN**;

**Analysis 7: Analysis 6 repeated excluding matches in which ASD cases had comorbid ADHD**

**DATA** OztanData7; **INPUT** Simple\_group &\$16. AVP\_Zscore; **Lines**;

Control -0.003190513

Autism -0.998400926

Control 1.001591439

Control 0.299993619

Autism -1.115658692

Control 0.815665073

Control 0.267183142

Autism -1.106453265

Control 0.839270123

Control 1.043737992

Autism -0.949605192

Control -0.0941328

Autism -0.707106781

Control 0.707106781

;

**RUN**;

**PROC GENMOD** DATA=OztanData7 ;

**MODEL** Simple\_group = AVP\_Zscore/ **DIST**=BINOMIAL **LINK**=LOGIT **TYPE3**

**SCALE**=PEARSON;

**RUN**;



**Analysis 8: Neonatal CSF OXT concentration, normalized within match, does not predict a later ASD diagnosis**

```
DATA OztanData7; INPUT Simple_group &$16. OXT_Zscore; Lines;
```

```
Control -0.008417825
```

```
Autism -0.995764515
```

```
Control 1.00418234
```

```
Control -0.421365389
```

```
Autism 1.141724265
```

```
Control -0.720358877
```

```
Control 1.084915941
```

```
Autism -0.200086752
```

```
Control -0.884829189
```

```
Control -0.253557439
```

```
Autism -0.848814161
```

```
Control 1.1023716
```

```
Control 0.445590379
```

```
Autism 0.699748528
```

```
Control -1.145338907
```

```
Control -0.238210476
```

```
Autism -0.859384326
```

```
Control 1.097594802
```

```
;
```

```
RUN;
```

```
PROC GENMOD DATA=OztanData8 ;
```

```
MODEL Simple_group = OXT_Zscore/ DIST=BINOMIAL LINK=LOGIT TYPE3
```

```
SCALE=PEARSON;
```

```
ESTIMATE "Range Odds Ratio" OXT_Zscore 2.287063172/ EXP;
```

```
RUN;
```