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| --- | --- | --- | --- | --- | --- |
| **Table S1: Health, Behavioral and Socio-demographic Description of Study Sample Overall and by Perinatal HIV-status in 11 – 18 years old Adolescent children from Kampala, Uganda** | | | | | |
|  | Overall  83 (100) | HIV Unexposed  24 (28.9) | HIV Exposed Uninfected  24 (28.9) | HIV Positive  35 (42.2) | p-value |
| **Child Health & Demographic Factors** |  |  |  |  |  |
| Female Child | 33 (39.8) | 13 (54.2) | 8 (33.3) | 12 (34.3) | 0.23 |
| Child current bed net use | 64 (77.1) | 23 (95.8) | 16 (66.7) | 25 (71.4) | 0.03 |
|  |  |  |  |  |  |
| Age, years Mean, (SD)  Age, years N, % | 13.8 (2.2) | 14.3 (2.2) | 14.3 (2.3) | 13.1 (2.0) | 0.02 |
| 11-14 | 52 (62.7) | 13 (54.2) | 12 (50.0) | 27 (77.1) | 0.06 |
| 15-18 | 31 (37.4) | 11 (45.8) | 12 (50.0) | 8 (22.9) |
| Birth weight, mean (SD) | 3.5(0.7) | 3.4 (0.6) | 3.6 (0.7) | 3.5 (0.6) | 0.91 |
| Apgar Score < 10 (N, %) | 49(68.1) | 16(80.0) | 12(54.6) | 21(70.0) | 0.20 |
| **Child nutrition** |  |  |  |  |  |
| HAZ [Mean (SD)] | -1.5 (1.6) | -1.6 (1.6) | -1.1 (1.1) | -1.6 (1.9) | 1.00 |
| BMIZ [Mean (SD)] | -0.9 (1.8) | -0.5 (1.0) | -1.3 (1.9) | -0.9 (2.2) | 0.57 |
| **Infection** |  |  |  |  |  |
| % Malaria/Helminth Infection | 6 (7.2) | 2 (8.3) | 2 (8.3) | 2 (5.7) | 0.90 |
| % Intestinal Protozoa | 9(10.8) | 3 (12.5) | 2 (8.3) | 4 (11.4) | 0.89 |
| Anemic (hgb<11g/dL) | 23 (27.7) | 3 (12.5) | 4 (16.7) | 16 (45.2) | 0.01 |
| **Caregiver’s Health & Demographic Factors** |  |  |  |  |  |
| Educational status |  |  |  |  |  |
| < Primary Education | 34 (42.5) | 14 (60.9) | 11 (45.8) | 9 (22.3) | <0.01 |
| Primary Education | 15 (18.8) | 7 (30.4) | 4 (16.7) | 4 (12.1) |
| Any O’level or higher | 31 (38.8) | 2 (8.7) | 9 (37.5) | 20(60.6) |
| Female Caregiver n (%) | 66 (79.5) | 20 (83.3) | 18 (75.0) | 28 (80.0) | 0.77 |
| Age (years), Mean (SD) | 42.8 (11.5) | 40.9 (9.3) | 42.9 (9.3) | 44.1 (14.0) | 0.30 |
| Wealth score, Mean (SD) | 3.0 (2.1) | 4.4 (2.1) | 2.2 (1.6) | 2.5 (2.0) | <0.01 |
| BMI (kg/m2), Mean (SD) | 24.4 (4.4) | 25.8 (4.7) | 22.4 (2.9) | 24.9 (4.7) | 0.65 |

|  |  |
| --- | --- |
| **Table S2. HIV Specific Information for Perinatally HIV Infected Children per Hospital Record since Enrollment in Care** | |
|  | **At first CD4 Assessment** |
|  | Median ( min – max) |
| Age (in years) | 4.0 (0.1 – 13.7) |
| Absolute CD4 Cell Count in cells/µL | 342 (6 – 2013) |
|  | **At Last CD4 Assessment** |
|  | Median ( min – max) |
| Age (in years) | 10.9 (6.3 – 14.5) |
| Absolute CD4 Cell Count in cells/µL | 772 (63 – 2521) |
| **Highly Anti-retroviral Regimenφ**  Naïve  Nevirapine based  Efavirenz based  Other or not-specified | N (%)  13 (22.4)  23 (39.7)  16 (27.6)  6 (10.3) |
|  | **Change /Time Since Assessment** |
|  | Median ,( min – max) |
| Age (in years) | 5.9 (0.6 – 16.6) |
| Absolute CD4 Cell Count in cells/µL | 270 (-1132 – 2053) |
| Months since last CD4 assessment | 3.4 (0 – 32.0) |
| φ: nevirapine based regimen is prescribed in combination with combivivir/duovir (n=9) orOR 3TC (n=1) or AZT & 3TC (n=13).  Efavirenz based regimen was prescribed in combination with combivivir/duovir (n=9) orOR 3TC (n=2) orOR AZT & 3TC (n=5).  Other HAART regimen included: not specified (n=1), Duovir N (n=1), Ritonavir & 3TC (n = 3) and Tenofovir, 3TC, Lopinavir/Ritonavir (n=2) | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Table S3: Summary of Proxy-report of Behaviorally Rated Inventory of Executive Function by Perinatal HIV-status in 6 – 18 years old School-age Children from Kampala, Uganda** | | | | | |
|  | Overall | Perinatally HIV-Unexposed | Perinatally HIV- Exposed Uninfected | Perinatally HIV-Infected | P-value |
| **PROXY-REPORTED MEASURES** | 166 (100) | 54(31.9) | 54(33.1) | 58(34.9) |  |
| **Domains & Subscales** | Mean (SD) | Mean (SD) | Mean (SD) | Mean (SD) |  |
| **Behavioral Regulation Domain** | 40.8 (11.4) | 38.2 (8.2) | 38.5 (11.6) | 45.2 (12.6) | 0.001 |
| Inhibit Subscale | 13.7(5.2) | 12.7 (4.3) | 13.1 (4.9) | 15.1 (6.0) | 0.028 |
| Shift subscale | 12.4 (4.4) | 12.1 I3.3) | 11.7 (4.5) | 13.3 (4.9) | 0.14 |
| Emotional control subscale | 14.7 (5.5) | 13.4 (3.7) | 13.6 (5.4) | 16.8 (6.3) | 0.001 |
| **Metacognition Domain** | 70.4 (19.5) | 65.3 (16.6) | 68.9 (18.9) | 76.7 (21.1) | 0.006 |
| Initiation | 12.1 (4.9) | 11.0 (4.0) | 11.2 (4.4) | 13.9 (5.6) | <0.01 |
| Planning | 18.7 (6.5) | 17.0 (5.2) | 19.3 (7.1) | 19.9 (6.9) | 0.048 |
| Working memory | 17.2 (5.7) | 15.8 (5.2) | 16.5 (5.3) | 19.0 (6.1) | <0.01 |
| Material Organization | 8.9 (3.1) | 8.5(3.0) | 8.5 (2.8) | 9.7 (3.3) | 0.041 |
| Monitoring | 13.6 (4.6) | 13.0 (3.4) | 13.4 (4.5) | 14.2 (5.0) | 0.372 |
| **Global Executive Component** | 111.2 (27.2) | 103.4 (20.7) | 107.5 (26.8) | 121.9 (29.9) | 0.001 |
| **Deficit Scores requiring Clinical Vigilance** | **N, %** | **N, %** | **N, %** | **N, %** |  |
| **Behavioral Regulation Domain** | 16(9.7) | 1(1.9) | 6(11.1) | 9(34.5) | 0.042 |
| Inhibit Subscale | 14(8.5) | 2(3.7) | 5(9.3) | 7(12.3) | 0.261 |
| Shift subscale | 13(7.9) | 0(0) | 5(9.3) | 8(14.0) | 0.021 |
| Emotional control subscale | 11(6.7) | 0(0) | 4(7.4) | 7(12.3) | 0.034 |
| **Metacognition Domain** | 14(8.5) | 3(5.6) | 4(7.4) | 7(12.3) | 0.42 |
| Initiation | 15(9.1) | 2(3.7) | 3(5.6) | 10(17.5) | 0.022 |
| Planning | 11(6.7) | 1(1.9) | 4(7.4) | 6(10.5) | 0.19 |
| Working memory | 12(7.3) | 1(1.9) | 3(5.6) | 8(14.0) | 0.040 |
| Material Organization | 15(9.1) | 5(9.3) | 3(5.7) | 7(12.3) | 0.4676 |
| Monitoring | 15 (9.1) | 4(7.4) | 5(9.3) | 6(10.5) | 0.85 |
| **Global Executive Component** | 14 (8.5) | 0(0) | 5(9.3) | 9(15.8) | 0.01 |
| **Subscales with deficit scores warranting clinical vigilance** |  |  |  |  |  |
| 0 of 8 | 112(67.9) | 45 (83.3) | 37(68.5) | 30(52.6) | 0.001 |
| 1 of 8 | 21(12.7) | 4(7.4) | 10(18.5) | 7(12.3) |
| >=2 of 8 | 32(19.4) | 5(9.3) | 7(13.0) | 20(35.1) |
| **SELF REPORTED MEASURES** | N=82  Mean (SD) | N=24  Mean (SD) | N=24  Mean (SD) | N=34  Mean (SD) |  |
| **Behavioral Regulation Domain** | 53.2 (10.1) | 47.7 (7.4) | 52.0 (8.6) | 57.8 (10.7) | <0.001 |
| Inhibit Subscale | 16.8 (3.2) | 14.9 (1.8) | 16.3 (2.8) | 18.5 (3.5) | <0.001 |
| Shift subscale | 14.9 (3.2) | 15.6 (2.7) | 14.4 (2.6) | 16.2 (3.5) | 0.006 |
| Emotional control subscale | 14.1 (3.8) | 12.8 (2.4) | 13.7 (4.0) | 15.2 (3.8) | 0.049 |
| **Metacognition Domain** | 59.3 (12.2) | 52.7 (8.6) | 55.7 (8.2) | 66.1 (13.3) | <0.001 |
| Task Completion | 14.6 (3.6) | 12.8 (3.3) | 13.6 (2.4) | 16.4 (4.1) | 0.001 |
| Planning | 18.2 (3.8) | 16.0 (2.6) | 17.2 (2.8) | 20.4 (4.0) | <0.001 |
| Working memory | 16.7 (3.6) | 14.8 (2.7) | 15.7 (2.6) | 18.6 (3.9) | <0.001 |
| Material Organization | 9.8 (2.3) | 9.0 (1.9) | 9.3 (1.9) | 10.7 (2.5) | 0.007 |
| Monitoring Subscale | 7.4 (1.9) | 6.4 (1.8) | 7.6 (1.5) | 7.9 (2.0) | 0.010 |
| **Global Executive Component** | 112.5 (21.5) | 100.4 (15.3) | 107.7 (15.3) | 123.9 (23.3) | 0.009 |
| **Number of Subscales Warranting Clinical Vigilance** | **N (%)** | **N (%)** | **N (%)** | **N (%)** |  |
| 0 of 8 | 56 (68.3) | 20 (83.3) | 16 (69.6) | 20 (57.1) | 0.03 |
| 1 of 8 | 10 (12.2) | 2 (8.3) | 5 (21.7) | 3 (8.6) |
| >=2 of 8 | 16 (19.5) | 2 (8.3) | 2 (8.7) | 12 (34.3) |

Table S4: Perinatal HIV-status in Relation to Performance on the Proxy and Self-Reported Measures of Executive Function in School-age Children

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Perinatally HIV-Exposed Uninfected vs. Perinatally HIV-Unexposed** | | **Perinatally HIV-Infected vs. Perinatally HIV-Unexposed** | | **Perinatally HIV-Infected vs. Perinatally HIV-Exposed Uninfected** | | **R2** |
|  | Adjusted Association | | Adjusted Association | | Adjusted Association | |  |
| **PROXY-REPORTED MEASURES (N=166)** | **Difference (95%CI)**  **T-SCORE RAW SCORE** | | **Difference (95%CI)**  **T-SCORE RAW SCORE** | | **Difference (95%CI)**  **T-SCORE RAW SCORE** | |  |
| **BRI Domain** | -0.2(-4.4,4.0) | -0.5 (-4.8, 3.8) | 6.4(2.7,10.1) | 4.7 (1.9, 7.9) | 6.6(2.0,11.3) | 5.7 (1.5, 9.9) | 0.23 |
| Inhibit Subscale | 0.4(-3.2,3.9) | 0.5 (-1.0, 1.9) | 4.3(0.1,8.5) | 1.2 (-0.3, 2.7) | 3.9(-0.6,8.4) | 0.7 (-0.9, 2.3) | 0.17 |
| Shift subscale | -2.4(-8.7,4.0) | -0.70 (-2.26, 1.1) | 3.1(-2.7,9.0) | 0.5 (-1.2, 2.34) | 5.5(-0.7,11.6) | 1.2 (-0.6, 3.0) | 0.22 |
| Emotional control subscale | 0.8(-4.2,5.7) | 0.04 (-2.0, 2.1) | 7.1(2.6,11.7) | 2.9 (0.73, 5.0) | 6.4(1.8,10.9) | 2.8 (0.9, 4.7) | 0.18 |
| **Metacognition Domain** | -1.1(-5.8,3.7) | -1.8 (-9.9, 6.3) | 4.7 (0.01, 9.3) | 6.4 (-1.9, 14.4) | 5.7(0.7,10.6) | 8.2 (0.2, 16.3) | 0.19 |
| Initiation | -1.4(-7.9,5.0) | -0.5 (-2.3, 1.7) | 7.9(1.3,14.5) | 1.8 (-0.4, 3.7) | 9.3(2.3,16.3) | 2.0 (-0.2, 4.2) | 0.19 |
| Planning | 2.1(-3.9,8.1) | 0.82 (-1.9, 3.5) | 2.7(-3.0,8.4) | 1.6 (-1.1, 4.25 | 0.6(-5.7,6.8) | 0.8 (-2.3, 3.9) | 0.17 |
| Working memory | -0.7(-5.5,4.1) | -0.01(-2.3, 2.2) | 5.5(-0.1,11.2) | 1.7 (-0.9, 4.2) | 6.2(1.0,11.4) | 1.7 (-0.3, 3.7) | 0.12 |
| Material Organization | -2.2(-5.9,1.4) | -0.7 (-1.9, 0.5) | 2.5(-1.4,6.3) | 0.6 (-0.6, 1.8) | 4.7(0.9,8.4) | 1.3 (0.08, 2.4) | 0.21 |
| Monitoring | -3.7(-9.9,2.5) | -1.3 (-3.3, 0.64) | 1.5(-4.9,7.8) | 0.55 (-1.5, 2.6) | 5.2(-1.0,11.4) | 1.9 (-0.1, 3.9) | 0.15 |
| **Global Executive Component** | -0.8(-5.0,3.4) | -1.2 (-11.3, 8.9) | 5.4(1.4,9.4) | 11.0 (1.1, 20.7) | 6.2(1.6,10.9) | 12.1 (1.8, 22.3) | 0.23 |
|  |  |  |  |  |  |  |  |
| **SELF-REPORTED MEASURES(N=82)** |  |  |  |  |  |  |  |
| **Behavioral Regulation Domain** | 5.5(0.6,10.3) | 5.1 (0.2, 10.0) | 10.5 (5.6, 15.4) | 10.6 (5.2, 16.0) | 5.0 (0.3,9.8) | 5.5 ( 0.9, 10.1) | 0.29 |
| Inhibit Subscale | 4.5(0.8,8.1) | 1.7 (0.2, 3.2) | 8.3(4.5, 12.0) | 3.6 (1.8, 5.3) | 3.8 (0.3,7.2) | 1.9 (-0.2, 3.4) | 0.31 |
| Shift subscale | 2.9 (-2.9, 8.7) | 1.2 (-0.51, 2.9) | 8.4 (2.6, 14.2) | 2.7 (1.0, 4.5) | 5.5 (-0.1, 11.1) | 1.5 (-0.2, 3.3) | 0.22 |
| Emotional control subscale | 5.1(-0.01,10.3) | 1.2 (-1.2, 3.5) | 9.2 (4.5, 13.9) | 2.9 (-0.8, 5.0) | 4.1 (-1.5, 9.7) | 1.8 (-0.1, 3.7) | 0.24 |
| **Metacognition Domain** | 3.9 (-0.2, 8.0) | 3.7 (-1.2, 8.7) | 10.8 (6.2, 15.5) | 13.6 (8.1, 19.2) | 6.9 (2.4, 11.4) | 9.9 (3.9, 15.9) | 0.28 |
| Task Completion | 3.4 (-1.6, 8.4) | 0.81 (-0.9, 2.5) | 9.6 (5.0, 14.2) | 3.5 (1.7, 5.3) | 6.2 (1.4, 11.1) | 2.7 (0.8, 4.6) | 0.28 |
| Planning | 4.1 (0.7, 7.5) | 1.2 (-0.4, 2.7) | 10.8 (6.7, 14.9) | 4.7 (3.2, 6.2) | 6.7 (2.7, 10.6) | 3.5 (1.7, 5.3) | 0.32 |
| Working memory | 3.4 (-0.7, 7.5) | 1.4 (-0.1, 2.9) | 8.8 (4.1, 13.4) | 3.6 (1.9, 5.4) | 5.3 (1.2, 9.5) | 2.3 (0.6, 4.0) | 0.24 |
| Material Organization | 2.1 (-2.7, 6.9) | 0.4 (-1.0, 1.7) | 7.1 (1.9,12.3) | 1.8 (0.5, 3.2) | 5.0 (0.8, 9.2) | 1.4 (0.2, 2.7) | 0.19 |
| Monitoring Subscale | 5.1 (0.8,9.5) | 1.1 (0.2, 1.9) | 7.2 (2.1, 12.3) | 1.4 (0.4, 2.4) | 2.1 (-2.5, 6.6) | 0.3 (-0.6, 1.3) | 0.14 |
| **Global Executive Component** | 4.8 (0.3, 9.3) | 12.4(0.2, 23.9) | 11.2 (6.3, 16.1) | 24.2 (13.9, 34.7) | 6.4 (1.8, 11.0) | 12.8 (5.4, 25.5) | 0.47 |
| \*All estimates are derived from a multivariable linear regression models.  \*\* Proxy-Reported measures are adjusted for: caregiver socio-demographic (age and education, social support, Perceived social standing & body mass index) and child-socio-demographic and behavioral health factors (apgar score at birth, birth-weight, anemic vs. non anemic status, and current vs. non-current bed net use). \*\*Self-Reported measures are adjusted for: caregiver socio-demographic (education and wealth score) and child-socio-demographic and behavioral health factors (Apgar score at birth, anemia and current vs. non-current bed-net use).  Regression models for raw EF scores are further adjusted for child age and sex. | | | | | | | |

Table S5-empirical: HIV-status in Relation to empirically determined Clinically Relevant Deficit in respective Subscales and Domains of the Proxy-reported BRIEF

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Perinatally HIV-Exposed Uninfected vs. Perinatally HIV-Unexposed** | | | **Perinatally HIV-Infected vs. Perinatally HIV-Unexposed** | | | **Perinatally HIV-Infected vs. Perinatally HIV-Exposed Uninfected** | | |
|  | PHEU PHU | | Adjusted Association | PHIV | PHU | Multivariate Model 2 | PHIV | PHEU | Multivariate Model 2 |
|  | **n/N** | **n/N** | **OR (95%CI)** | **n/N** | **n/N** | **OR (95%CI)** | **n/N** | **n/N** | **OR (95%CI)** |
| **BRI Domain** | 6/54 | 1/54 | 7.7 (0.8, 75.3) | 9/57 | 1/54 | 12.6 (1.4, 113) | 9/57 | 6/54 | 1.6 (0.5, 5.1) |
| **Metacognition Domain** | 4/54 | 3/54 | 1.0 (0.2, 5.2) | 7/57 | 3/54 | 1.7 (0.4, 7.4) | 7/57 | 4/54 | 1.6 (0.4, 6.1) |
| **Global Executive Component** | 5/54 | 0/54 | - | 9/57 | 0/54 | - | 9/57 | 5/54 | 1.9 (0.5, 6.5) |
| **>=1 vs. 0 Subscale Deficit** | 17/54 | 9/54 | 2.1 (0.8, 5.6) | 27/57 | 9/54 | 4.0 (1.5, 10.1) | 27/57 | 17/54 | 1.9 (0.9, 4.3) |
| OR= Odds Ratio, CI = Confidence Interval; n = number of children with empirically determined deficit; N=n number of children in HIV stratum  \*All estimates are derived from a logistic regression model with empirically defined deficits (i.e. 1.5 standard deviations above the mean score) as **dichotomous** outcome variable.  \*\* Given a low number of events, the multivariate model is minimally adjusted for child age, sex, material wealth and bed net use only. | | | | | | | | | |