

# Neuropsychiatric impact of HIV in children



**Rene Nassen,**

Child and Adolescent Mental Health Service  
Lentegeur Hospital/University of Stellenbosch

**John Joska, Catherine Ward**

University of Cape Town

# This presentation

- The stories of 'Aviwe' and 'Luthando' and 'Cecile'
- Systematic literature review: findings
- local context: what have we been seeing?
- Recommendations ( clinical and educational)





## Case 1: 'AVIWE'

*Eleven year old girl who was admitted to a children's home as an infant, after her mother died. She was born and diagnosed HIV positive at Somerset Hospital. She was hospitalized three times during early childhood for severe skin rashes, otitis media and gastroenteritis. She was initiated on ART, aged eleven as part of a research study. Her CD4 count before treatment was 328 and 889 one year after treatment started. Viral load was undetectable one year post ART. The initial treatment regime was AZT, KAL and 3TC.*





## Referral to psychiatry 2004

*She presented with severe hyperactivity, inattention, since age 6. Age 11 episodes of aggression, confusion, visual hallucinations, 'bizarre behaviour'. Declining cognitive function from low average to 'low' mild ID, placed at special school. EEG **left frontal and left centro-temporal foci**, MRI normal, LP normal. Diagnoses Mental Disorder NOS 2° GMC (new onset seizures), ADHD, Complex Partial Seizures, HIV encephalopathy?. Good response Valproate and Methylphenidate. Ongoing aggression, oppositional behaviour despite psychological inputs. Placed at an alternative children's home.*

# Re-referral

- *2010 she was re-referred to CAMHS service, with symptoms of depressed mood, 'scary thoughts', fatigue, suicidal ideation, and poor concentration. She reported fleeting auditory hallucinations, no visual hallucinations. Sodium Valproate stopped due to drug interactions, and still using methylphenidate. EEG normal . Current ART was AZT, 3TC, NVP. Diagnosis of Major Depressive Episode (MDE) with psychotic features?. Citalopram initiated.*
- ***Now 19 years old and transferred to adult services***





## Case 2:Luthando: 'I wish I were Peter Pan'

- *Abandoned as an infant at police station, malnourished, severe neglect, maggot infestation. Diagnosed HIV positive infancy. Meningococcal meningitis, miliary TB. HIV encephalopathy (age 6). Initiated ART age 11, CD4 pre and post ART 432 and 776. Treatment regime AZT, Nevirapine, 3TC CT brain 2 areas white matter hypo-intensity R frontal region. Age 10 neuropsychological battery showed fine and gross motor problems, processing speed, visuospatial tasks. Good vocabulary, verbal reasoning, auditory memory. **FSIQ average range.***



## Referral psychiatry 2004 aged 12

- *Described as a child who 'never smiled', always on his own, lived in a 'fantasy world', social difficulties at school worsened. Refused to acknowledge his race or HIV status, attachment and fantasy of adoption by host family. Refused contact with biological family. Presented with aggression, verbal abuse staff, 'out of control'. Academically , struggled numeracy, good literacy skills, average IQ on cognitive testing, but executive functioning deficits. Well behaved at school, struggled to socialise with peers. Repeat cognitive testing age 13, **FSIQ average but not coping academically**. Transfer to special school in G8.*
- *Diagnosis MDE, Autistic Spectrum Diagnosis. Poor response to psychological interventions and medication ( Risperidone, Valproate). Placement problems.*
- ***Loyiso turned 20 this year. Continues to write short stories Wants to be a film maker. Completed matric exams on 26/11/2012!***

## Case 3 'Cecile': referred 2012

*16 yo female, currently admitted adolescent in-patient unit in Cape Town. Admitted for acute containment following suicide attempts. Depressed mood, agitation, distress at being placed at local children's home and separation from foster mother.*

*She was perinally infected, on ART since age 11 (ABC, 3TC, Efavirenz). Followed up local tertiary hospital and attends adolescent groups there. Adherence uncertain as a fellow resident recently OD'd on 60+ of her ARV medications. She admits to forgetting 1-2X weekly and 'throwing ARV meds away' when she is angry. Latest Cd4 count 734.*

*In the unit noted to be distractible in groups, memory disturbances. Basic neuropsych screen (MOCA) abnormal (scored 22/30). Lost score in 'visuospatial, memory, naming, attention'.*

**Contacted ARV clinic: No prior neurocognitive screen**

**No neuroimaging**

*Investigations ordered:*

*CT brain: calcification basal ganglia*

*Neuropsychological battery: in progress....*



# Literature review

1. HIV in the Pre-HAART era
2. Impact of HAART across the spectrum of 'HAND'
3. Psychiatric presentations in the post HAART era



# HIV in the pre-HAART era: neuropsychiatric impact

- **Cognitive impairment**
  - occurs early and progresses over time (8-60%)
  - early onset and high rates of PHE, neurological deficits.
- **Neuropsychological testing:**
  - Exec functioning deficits (mental processing, sequential processing, comprehension, visuospatial and time orientation tasks)
  - Memory deficits, fine motor, processing speed, attention/concentration difficulties
- **Psychiatric:** High lifetime prevalence psych disorders, particularly ADHD, Anxiety, Depression
- **Aetiology multifactorial**



## Key findings: impact of 'HAART' across the spectrum of HIV associated neurocognitive deficits ('HAND')

- Dramatic decline in PHE, reversible complication of HIV
- Initiating ART before onset PHE neuroprotective (CHER STUDY). Greatest neurocognitive gains early ART
- Neurocognitive scores improve ( average range)
- Scores remain lower than pop norms, and PHIV exposed.
- **Persistence of neuropsychological deficits** ( *language, working memory, attention deficits, processing speed, visuospatial tasks*)
- Suggests early HIV neurotoxicity may be irreversible



## Medical/CNS variables



- Decreases in CSF and plasma VL not invariably associated with improvements in neurocognitive functioning: studies varied
- Why? Genotype studies reveal CSF and plasma mutations differ . May explain poorer neurological response despite an undetectable VL.
- Neuroimaging abnormalities may persist post ART. Associated with significantly poorer neurocognitive performance.

## Psychiatric presentations in PHIV children and adolescents

- Higher rates psychiatric disorders, psychotropic drug use but psychotic disorders less common.
- Commonest psych presentations: Mood Disorders, Disruptive Behaviour Disorders, Anxiety disorders, Substance Use Disorders
- ADHD : Frontal lobe pathology
  - Deficits frontal subcortical pathways
  - Dopamine pathways
- Equal rates psychopathology in perinatally HIV infected (PHIV) and perinatally HIV exposed (PHEU) youth ( in utero exposure, similar psychosocial stressors)



# Psychopathology



- Adolescents: High rates depression, non disclosure HIV status, school drop-out, sexual risk behaviours and SUD's
- Caregiver psychopathology associated with youth psychiatric symptoms and substance use.
- Suggest integrated mental health services for caregivers and children
- HIV prevention strategies to be incorporated into existing mental health programmes

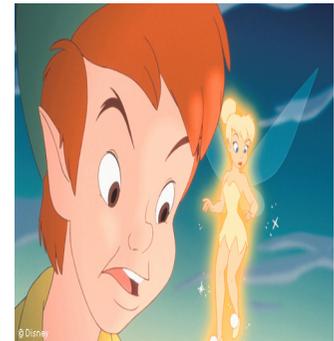
# Local context (Western Cape) : Themes



- Access to 'care' limited
- Late initiation of ART
- Cognitive impairment, HIV encephalopathy ( new onset seizures)
- Poor academic performance
- High rates ADHD, disruptive behaviours, mood disorders emerge during adolescence
- Neuro-imaging: functional scan abnormalities
- On-going problems of late diagnosis, stigma
- Psychosocial adversity
- Child protection issues ( lack of services by social workers/social welfare agencies.
- Adolescents horizontal infection ( early sexual debut/rape/substances)

# Reflection on cases presented: Themes

- Late initiation ART
- Neurocognitive impairment at psychiatric presentation.
- Adherence issues
- No baseline neurocognitive screening
- Management in 'silo's'
- Lack of integration of services obstruct effective case management. Contributed to negative outcomes?
- No transition service to adult care



# Recommendations: clinical

- **ART:** Early initiation of treatment  
ART CNS penetration in children with neuropsychiatric presentations
- **Screening:** Baseline neurological  
Neurodevelopmental assessments  
Mental health screening  
Need for user-friendly screening instruments at primary level
- **Multidisciplinary assessments**
- **Integrated models of care** ( family based)
- **Prevention strategies:** Social Skills/ HIV awareness/ sex education in existing mental health programmes



# Recommendations:educational

- **Confidential database** of HIV+ children which is centralized and managed by school psychology services?
- 'At risk' children to be referred to school psychologists
- **Remediation** focussed on specific areas of deficit
- **Mainstream vs 'special school'?**  
Access to **mutidisciplinary educational team** within DOE
- **Referral pathway/liaison** between DOE to DOH service .
- **Task team** consisting of DOE and DOH to formulate a coherent action plan?



# Thank You!

