

HIV Paediatric case 12 – Matthias



 This is 5 year old Matthias. He arrived in hospital with a very high fever, only semi conscious a short time ago. His health passport shows he is HIV positive and on ART....

HISTORY:

 Matthias was first tested HIV positive when he was a four months old baby. His mother tested positive at the same time. Matthias was enrolled in clinical study and so was given a CD4 count which came back at 1,798, but his mother was not given the test. She was not showing any clinical signs of HIV infection and so was judged to be at WHO stage one. Matthias was being breastfed.

STOP POINT

**Mother and baby tested HIV reactive four months after birth.
Matthias CD4 Count: 1,798. (Done as part of a study).
No CD4 done for the mother. She has no symptoms.**

WHAT WAS MATTHIAS' HIV STATUS?

WHAT OTHER TESTS WOULD YOU GIVE MATTHIAS AND HIS MOTHER IF AVAILABLE?

WOULD YOU TODAY START ART FOR MATTHIAS OR HIS MOTHER?

1) Matthias is exposed. The positive rapid test is not definitive as it could be produced by anti-bodies from the mother through breast-feeding.

2) Matthias needed a DNA-PCR to determine whether he was infected or not. If that is not available he needed to be rechecked with a rapid test at 12 months and again six weeks after breastfeeding stops. CD4 counts in a baby this age should be very high. They could be even higher than 1798. But you cannot tell a lot from them, as they are changing and decreasing as the baby grows. He did not need a CD4 count.

3) If Matthias tested positive with a DNA/PCR at four months then he needed to be started on ART regardless of his clinical or immunological stage because the disease progression in infants is very rapid, as was shown by the CHER trial.

The mother should have been started on ART as she is breastfeeding and can infect the baby.

 *Matthias was started on ART at age 5 months. But his mother was not. A few months later, before Matthias was one year old, his mother became suddenly sick and died. After his mother's death, Matthias went through a period of poor adherence and for a while was recorded as a defaulter, until it was decided who would look after him. Matthias and his elder brother, who also tested HIV positive, eventually went to live with their uncle – who took them back to the health centre...*

STOP POINT

HISTORY

5 months Old: Matthias initiated on ART and co-trimoxazole prophylaxis.

10 months old: Matthias mother died. Matthias defaulter

19 months old: Matthias goes to live with uncle

WHAT FEEDING ADVICE WOULD YOU HAVE GIVEN TO THE UNCLE?

WHAT SHOULD HAPPEN TO CONFIRM MATTHIAS' HIV STATUS?

- Formula + other foods.
- He needs a rapid test (or a DNA/PCR). As he is no longer breast feeding and older than 18 months a positive rapid test should be definitive.

 *At 19 months, when Matthias restarted ART, a DNA-PCR test confirmed that he is HIV positive. Shortly after another CD4 came back at 906.*

STOP POINT

THE DNA-PCR WAS DONE BECAUSE MATTHIAS WAS PART OF A STUDY. WOULD IT HAVE NORMALLY BEEN NECESSARY?

No it was not necessary. When he was five months he should have had a DNA/PCR test to confirm HIV infection if he was not showing any clinical signs. But now he is more than 18 months so he will not have any of his mother's anti-bodies. He has stopped breast feeding so he is no longer exposed to the virus...so a rapid test should be a reliable and definitive indicator of HIV infection.

▶ *Matthias' height and weight have been recorded at regular intervals throughout his life, but the growth chart has only been partially filled out. This is what it would look like if it had been filled out properly... Apart from a short period immediately after his mother died it shows relatively normal growth through his first five years. His most serious previous illness was when he was three. Matthias was admitted to hospital with suspected Malaria and Meningitis.*

Now, aged five years old, he arrived in hospital a short time ago with symptoms that had appeared suddenly in the early morning: On admission he had convulsions with eye rolling and foam in front of the mouth, neck stiffness, a temperature of 39,6 and a high pulse rate.

STOP POINT

Matthias history on admission Age: 5
Convulsions, foam in front of mouth, eye rolling.
Neck stiffness
Temperature: 39.6 C

WHAT WOULD HAVE BEEN THE POSSIBLE CAUSES FOR MATTHIAS' FEVER, NECK STIFFNESS AND CONVULSIONS?

Meningitis or Malaria are both possible. He needs a lumbar puncture.

▶ *After treatment to stop the convulsions, Matthias appears tired, but conscious. The examination shows that he still has mild neck stiffness. And he has a rapid pulse and fever. Matthias has a slightly swollen liver and spleen. But there are no signs of either oral sores, or infection in his ears. He is given tests to try to determine whether he has Malaria or meningitis. These include a lumbar puncture which shows a very high opening pressure. The liquid collected is clear. The test results suggest he has Malaria and could have bacterial meningitis so he is treated for both....*

STOP POINT

TEST RESULTS:

- **MRDT: Malaria negative**
- **Malaria Parasites under the microscope: ++**
- **Lumbar puncture: High opening pressure.**
- **Consistent with possible bacterial meningitis.**
- **Hb: 11,0 g/dl**

24 HOURS AFTER ADMISSION:

▶ *A day after admission, Matthias has improved a lot. He has had no more convulsions. He appears fully conscious and able to eat on his own, walk and talk.*

STOP POINT

WHAT WOULD YOU WANT TO CHECK IN A PHYSICAL EXAMINATION? WHAT OTHER TESTS WOULD YOU ORDER?

Look for other opportunistic infections in both the physical exam and tests.



Matthias no longer appears to have neck stiffness – although this is hard to assess as he is not relaxed. He has slightly pale conjunctiva, and also a mildly swollen liver and spleen. He does not have a noisy chest. His reflexes are normal, in his arms, legs and feet. They are also the same on both sides of the body. When asked about ART adherence, Matthias' uncle says that he has had no problems giving the medicines. If he forgets, he says that Matthias even asks for them. There have also not been any missed appointments. However there is no adherence information in his current health passport so his adherence over time is impossible to confirm. A CD4 count is done which comes back at 518.

STOP POINT

CD4 results

Age 5 months: 1,798

Age 19 months: 906

Age 5 years: 518

DOES THE DROP IN CD4 FROM 906 TO 518 WORRY YOU?

WHICH WHO STAGE WOULD YOU CLASSIFY MATTHIAS?

DOES MATTHIAS' ART TREATMENT NEED REVIEW OR FURTHER INVESTIGATION?

WOULD A VIRAL LOAD TEST BE HELPFUL NOW?

1) The drop from 906 has to be viewed taking his age at the time into consideration – so it should not be a cause for alarm. The CD4 only stabilizes at adult rates from about 5 years old. Until then the CD4 percentage is a more reliable guide. The CD4 also goes up and down.

2) WHO Stage III – bacterial meningitis

3) Formally he needs possible treatment failure to be investigated as he seems to have a new WHO Stage III illness (a repeated attack of bacterial meningitis). However it is very hard to tell – as a definitive diagnosis was not made – either this time or during his previous illnesses.

4) A viral load would not distinguish between treatment failure and poor adherence, so before doing any assessment for possible treatment failure it is important to investigate adherence further. The recent CD4 of 518 is somewhat reassuring – showing that there is time to investigate properly and address adherence first.

A WEEK LATER:



Matthias has recovered and is now ready to leave the hospital. He'll be going back to his nursery school where he is doing well. The teacher is informed about Matthias' status. Matthias' elder brother, who is 12, was told about his status a year ago. But Matthias does not yet know he is HIV positive. He is starting to ask why he and his brother have to take pills every day.

STOP POINT

WHAT WOULD YOU ADVISE THE UNCLE TO TELL HIM?

WHEN WOULD YOU RECOMMEND THE UNCLE TO TELL HIM OF HIS STATUS?

Support the uncle to introduce the process of disclosure. Disclosure is a process that may take months

or even years, and there are appropriate tools and words/terms to use at a particular age or level of maturity/understanding. Children need honest answers why they are taking medicines with partial disclosure and age-appropriate information which does not immediately name HIV. So Matthias needs some kind of explanation.

5 MONTHS LATER...

 *5 months later, Matthias has been brought back into the hospital with a fever, vomiting, headache and diarrhoea which started the day before. When he first arrived he had convulsions which were treated. An examination shows that he does not have neck stiffness. But he has a high fever and a weak rapid pulse. He is not anaemic and does not have oral sores or an ear infection. A lumbar puncture and malaria tests are once again done. This time the lumbar puncture is negative for meningitis. However the malaria test is positive. Matthias' grandmother says that he has often had a cough, so a chest X-ray is ordered for when Matthias is sufficiently recovered....*

TWO DAYS AFTER ADMISSION....

2 days later, after treatment, Matthias is much better. The convulsions have stopped and his fever has dropped. But he does have a bit of a cough. His ART is now being reviewed to see if further investigations or changes are needed.

STOP POINT

WHAT WOULD YOU WANT TO CHECK IN AN ART REVIEW?

Adherence. Check if he has any other signs of TB? Cough?

 *His notes show that after his previous admission five months ago, Matthias was not given a viral load test. Matthias' uncle is once again asked about adherence and says that Matthias does take his medicines. But it turns out that his adherence during the five months since his last admission has only been 34% based on his pill count. This time he also has previous health passports to check adherence before that. It appears that Matthias's adherence has been at 34% for a long period of time....*

STOP POINT

WOULD YOU NEED TO EVALUATE FOR POSSIBLE TREATMENT FAILURE? WOULD A VIRAL LOAD TEST OR CD4 COUNT BE USEFUL AT THIS POINT? HOW WOULD YOU EVALUATE FOR TB?

1) Before evaluating for treatment failure, his adherence needs to be sorted. Then it would be worth checking that there is nothing else happening and that the medicines are still working. He had a Stage 3 condition with suspected meningitis, so an investigation for treatment failure is justified. The strange repetition of exactly 34% adherence over quite a long period of time in his health record does raise suspicion that there may have been an error recording adherence.

2) A viral load test would tell you very little. We know his adherence has been poor, so he will almost certainly have a high viral load. A CD4 count would tell you whether his immune system is badly compromised and give an indication as to how urgent it is to rule out treatment failure. The fact that a CD4 was done six months ago for a comparison would also be helpful, but it would not give a definitive diagnosis.

3) This would vary depending on lab facilities. Matthias could do a sputum test and have an X-ray taken. Also look for clinical signs like swollen glands, night sweats and cough.

 *The chest X-ray has now been done. It shows infiltrations on the left mid and lower lung field. However Matthias has no night sweats or frequent fevers and is not losing weight. As he is already on antibiotics, it is decided to see if the chest improves and to repeat the Chest X-Ray in 1 month. A viral load test is done – the result will also take a month. A CD4 test is done and the result is available the same day at 776.*

STOP POINT

Age 5 months: 1,798

Age 19 months: 906

Age 5 years: 518

Aged 5, years, 6 months: 776

HOW WOULD YOU INTERPRET THESE CD4 RESULTS?

The recovery of his CD4 count to 776 over the last 6 months is encouraging. Certainly there is time to work on his adherence and a clinical decision about treatment failure or not is not urgent.

ONE DAY LATER

 *The next day Matthias presented with blisters on his lower right lip.....*

STOP POINT

WHAT DOES THIS LOOK LIKE?

HOW WOULD YOU TREAT IT?

Some kind of herpes sore. It is not serious and does not need special treatment.

 *Matthias is diagnosed with Herpes simplex. There is no treatment required for this. It should clear up by itself. A week later Matthias was discharged.*

ONE MONTH LATER (AGE 5 YEARS, 7 MONTHS)

 *It is now a month later and Matthias has come to the clinic to repeat his Chest X-Ray and to collect his ARVs. This is what the X-ray looked like. And this is what the earlier x-ray looked like. The cough has cleared up and he has had no night sweats or fevers, so TB is, for the moment, ruled out. However his adherence is still recorded at only 34%. The result of the viral load, taken the month before is 2995 c/ml.*

STOP POINT

**HOW WOULD YOU INTERPRET THE VIRAL LOAD?
CAN IT HELP TO DETERMINE TREATMENT FAILURE?
DOES IT HELP WITH OTHER CLINICAL DECISIONS?
WHAT WOULD YOU DO?**

- 1) The viral load is as you would expect it to be because we knew from the pill count that Matthias has poor adherence. The test shows how much of the virus he has in his body. If it is high it can be for two reasons. The first poor adherence. The second possibility is that he has developed resistance and so the treatment is failing. It is important to note that poor adherence predisposes to treatment failure (virological failure), so the viral load should be checked again when the adherence to ART is optimal.
- 2) No – not at this stage, as we know he has been non-adherent, so that would explain his high viral load.
- 3) No, the CD4 is more useful now to make sure that his defensive system is still working and see how urgent making any decision about possible treatment failure is.
- 4) Try to find out the reason for poor adherence in a non-judgemental way. Once adherence has become optimal, the viral load could be rechecked and if still found high, then virological failure (treatment failure) should be considered.

SIX MONTHS LATER.... Age 6 years, 1 month



It is now six months after his previous visit. Matthias has been going to a club for HIV positive children, which is already attended by his elder brother. During the last year his weight has been increasing at a normal rate. He is now 20 kilos. With a height of 112cm, that makes him well nourished. Over the last months Matthias and his uncle have been given intensive adherence counseling. Matthias was promised a surprise if he can get 98% adherence or above. Two months ago, when Matthias last picked up his ARVs he had an adherence rate of 95%. Today he has an adherence of 98% - so after the clinic, he'll earn his prize.