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Fusing journalism and TB – telling the stories as they are

### **Children and TB – the diagnostic challenges**

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It all began with a story I was writing on TB/HIV co-infection among children. I met scores of little children living with HIV who had also contracted TB, which is the most common co-infection that attacks people living with HIV, be it adults or children.

The children were already grappling with the fallouts of HIV, and TB was adding to their misery, robbing them of the joys of growing up, the privileges of going to school, and most importantly, just the joys of being carefree children. They were emaciated, weak, cranky and did not know why they were different from other children of their age.

The human angle aside, the children who were fortunate to access treatment were also posing severe challenges to their doctors who were grappling with issues of accurate diagnosis and treatment thereafter.

#### **This is my story:**

Sunshine and fresh air floods the general ward in the Regional Paediatric ART Centre of Indira Gandhi Institute of Child Health (IGICH), Bangalore. On a bed that is way too large for her, Aditi (2 ½), waif – like and weighing just 6.5 kgs, lies, savouring a biscuit and smiling. Her eyes appear too large for her pale, fleshless face; her limbs resemble brittle twigs. As her mother picks up Aditi and stands her on her feet, it seems like her frail legs will snap under the weight of her body. Dr G.N. Sanjeeva, Senior Medical Officer says Aditi has just been diagnosed HIV positive and he suspects she also has TB. But he is worried that it might not be possible to substantiate his suspicion through tests because it is difficult to make accurate diagnoses of TB in children. This will make it doubly difficult for him to decide on a course of treatment for Aditi.

Sushil (12) is HIV positive and has suffered several attacks of TB, which has in turns targeted his stomach, brain and lungs. Though he has recovered each time after intensive treatment, these attacks have posed severe diagnostic problems to his doctors. He is presently on anti-retroviral therapy (ART) as well as TB medication and his mother says he has to ingest about 10-12 tablets everyday. At times when he is suffering from more than one opportunistic infection (OI), his pill burden goes up to as many as 16 pills per day. This often makes him irritable enough to refuse medication. His treatment is being facilitated at SEWA Clinic in Bangalore by Milana, a support group for families affected by HIV/AIDS. SEWA Clinic is a charitable facility that provides free medical aid.

At Sneha Care Home, Bangalore, an institution that provides holistic care to HIV positive children, Raju (11), a double-orphan, who is HIV positive has just recovered from TB and is currently only on ART medication. Sister Maria, Clinical Coordinator says, "When Raju was admitted to Sneha Care Home, he was malnourished, had a very low CD4 count, and had TB and pneumonia as well. It

has taken months of careful nursing and intensive medication for his multiple health complications to bring him back to health."

### **Diagnosis – the complexities**

Aditi, Raju and Sushil and hundreds like them present challenges to doctors as treating TB and HIV co-infection in children is associated with complex issues. Even though they have good access to treatment and the potential to live a healthy life they face severe problems while being assessed for treatment. The most challenging of these is related to accurate diagnosis of TB. While exact figures for children who suffer from co-infection of HIV and TB are not available, WHO figures indicate that at least one-third of the 33.2 million people living with HIV worldwide are infected with TB, are 20-30 times more likely to develop TB than those without HIV and one in four people with HIV die due to TB. It is evident that a large number of these will be children. According to WHO, over 250,000 children develop TB and 100,000 children will continue to die each year from TB.

Closer to home, India has the highest burden of TB in the world. Exact figures for children suffering from TB are not available but it is the leading cause of death among Indians between the ages of 15 and 45— the most productive age group— causing the country a staggering US\$3 billion in economic losses each year.

TB is also the most common co-infection in people living with HIV, and children are no exception. HIV is the most powerful factor known to increase the risk of TB in children and the prevalence (more often extra-pulmonary) is almost 60 per cent. Revised National Tuberculosis Control Programme (RNTCP), India specifies in its guidelines that "...diagnosis of TB in children has to be based on a combination of clinical presentation, sputum examination wherever possible, chest X ray, Mantoux test and history of contact. Diagnosis of TB in children should be made by a medical officer. Where diagnostic difficulties are faced, referral of the child should be made to a pediatrician for further management..." (<http://www.tbcindia.org/pdfs/Consensus%20statement.pdf>)

Dr Sanjeeva says, "Diagnosis is difficult even where a combination of methods is used. Children are unable to cough up sputum like adults; in children TB is a paucibacillary (containing very few bacilli) disease, making it difficult to detect and test results can often show false negative. It is possible to use samples from a child's lung or stomach but the procedures are invasive, and therefore traumatic. They also require trained staff and good facilities, which are not always available. The Mantoux test, which is commonly used to diagnose TB in children, is also not very reliable. Additionally, it is not useful in children above five years in age. " He continues, "This indicates a need for the doctors to have a high index of suspicion. We often rely on history of contact and sometimes resort to treatment if we find that parents or people associated with the child have TB. This can lead to over-treatment or unnecessary medication."

Overlapping symptoms between HIV and TB pose further diagnostic problems. Several symptoms associated with TB, such as fever, weight loss, cough etc can be common to other (OIs) associated with HIV and in the absence of reliable tests, can result in wrong diagnosis, and therefore wrong treatment, both of which are dangerous.

Dr B Satish, who has been treating Sushil for over a decade says, "Treating Sushil has been extremely difficult because of repeated attacks of TB combined with his

HIV positive condition. When children need TB and HIV medication simultaneously because their symptoms warrant it, we always stabilize the TB first before beginning ART. Thereafter, we need to choose the right combination of ART so it does not interfere with the TB medication. But to begin with, it is absolutely imperative for us to be sure of our TB diagnosis.”

The good news is that despite the pill burden, adherence among children is very promising because of commitment on the part of caregivers and their recovery rates are good. For instance, out of 730 children registered for TB treatment over the past four years at IGICH, only two children did not complete the treatment. The above factors indicate the need for better tools to accurately diagnose TB in children, whether or not they are HIV positive.

As stated in Pathways to better diagnostics for Tuberculosis, A blueprint for the development of TB diagnostics by the New Diagnostics Working Group of the Stop-TB Partnership, “...Increasing the speed, effectiveness and accuracy of diagnostic tests is central to the goal of rolling back the global tuberculosis epidemic that afflicts nearly a third of the world’s population. Though recent and ongoing advancements in drug therapies offer great promise for saving lives, the unfortunate fact is that new medicines have limited value in the places where TB is rampant. This is because the principal diagnostic tools used in developing countries for determining whether someone has tuberculosis – microscopic examination of stained sputum and chest X-ray – are simply not accurate enough to identify many TB infections. In addition, many poor and vulnerable people lack access to even these basic diagnostic tools and so do not find out what is wrong with them until it is too late to successfully treat the disease and until long after they are likely to have transmitted the disease to others. What is required are far simpler, accurate point of care tests that can be used in remote health centres to reach the majority of tuberculosis sufferers ...”

### **Is it happening?**

Given the importance of having access to simple, accurate point of care tests, where are we presently providing those? Dr Madhukar Pai, MD, PhD, Asst. Professor and CIHR New Investigator, Mc Gill University, and Co-Chair, Stop-TB Partnership’s New Diagnostics Working Group says, “Pediatric TB is definitely a big diagnostic challenge and the need for a non-sputum based test is a big one. A big challenge for evaluating new diagnostics in children is the lack of a good gold standard – active TB is hard to confirm in children because they are rarely culture-positive. There are some non-sputum based tests available but none of them really work. Efforts are underway to improve them, but nothing is imminent.”

According to Dr Pai, “India has the potential to solve its TB problem with “homegrown” solutions. Indian pharma companies revolutionized access to high-quality, affordable AIDS drugs through generic production—effectively becoming the world’s pharmacy for antiretroviral drugs and saving millions of lives. Indian companies could also become the world’s hub for high-quality generic diagnostics, including those for TB. India has a growing number of domestic diagnostic manufacturers. There is a growing R&D community in India that could spark innovation of new diagnostics. Small Indian biotechs and start-ups have already invested in front-end research to identify new ways to detect TB and other diseases. They are now interested in moving innovative products forward but lack the capacity for large-scale clinical trials. Several Indian academics are involved in TB research, but lack the ability to convert their scientific work into commercial products.”

While this story is based in India and reflects local challenges, these are also challenges that the larger world is grappling with. The world community needs to come together with increased will, funding commitments and vigour to research and come up with better diagnostic tools for paediatric TB. Children like Sushil and Aditi have a right to good health and what better place to raise this issue than a conference themed Rights Here, Right Now?

*Sources for information*

[http://www.who.int/tb/challenges/hiv/factsheet\\_hivtb\\_2009update.pdf](http://www.who.int/tb/challenges/hiv/factsheet_hivtb_2009update.pdf)

[http://www.searo.who.int/en/Section10/Section2097/Section2106\\_10681.htm](http://www.searo.who.int/en/Section10/Section2097/Section2106_10681.htm)

*Names of children have been changed to protect their identities.*

*An abridged version of this story was first published in Panoscope, a magazine published by Panos at AIDS 2010 held in Vienna in August 2010.*

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