



# Diagnostic breakthrough in children's tuberculosis

## Tuberculosis (TB): The Killer Number One

For Cambodia's children, tuberculosis (TB) is their killer number one! Once the diagnosis of TB is made in a hospitalized child, treatment is initiated. Depending on the severity of the disease, the patient will be followed-up over six to 15 months on an outpatient basis by our **TB outpatient facilities**. **In 2010, the number of TB outpatients was 25'220 in the Kantha Bopha Hospitals of Siem Reap, and 22'600 in Phnom Penh!** During the 19 years of our pediatric activity in Cambodia, no recurrence of TB came ever to our attention, which may label the cure as "sustainable".

The compliance in observing the treatment and requirement of follow-up until the end of treatment is 95%! Given the poverty of these families, Kantha Bopha comes up for the involved costs of transportation to and from the hospital which is between 2.00–10.00 USD, depending on the distances between 50 km and 300 km.

### Initiating scientific publication

Three years ago, we decided to install a magnetic resonance scanner (MR imaging) at the Kantha Bopha III (Jayavarman VII) Hospital of Siem Reap Angkor. This **method allows for high diagnostic imaging accuracy of TB** manifestation in the central nervous system and other parts of the body, a diagnosis known to be difficult and often missed in children. While MRI is localizing the acute manifestation of TB, the scanner also allows for analysis of metabolites and their derivatives by means of magnetic resonance spectroscopy (MRS) and thus for demonstration of lipids which are characteristic of the disease. In undergoing these studies by MRI and MRS the children are not exposed to any radiation.

Our first scientific results elaborated by Prof. Ky Santy, head of the Imaging department of the Kantha Bopha III Hospital in Siem Reap Angkor, we published in the February 9, 2011 issue of the European Journal of Pediatrics (see: [www.beat-richner.ch](http://www.beat-richner.ch)). Further publications are in preparation that will document and discuss the diagnostic challenge of TB in children and the fundamental diagnostic differences between children and adults. The persisting underestimation of TB in children, especially in the poor world, causes the worldwide practiced under treatment or rather non-treatment and, therefore, the high mortality of children from TB in the poor world.

### **BCG "immunization" is ineffective. – Will prevention of TB in children at the age of 4 weeks to 8 months be possible?**

TB specific T-cells are documented in about 30% of young and healthy child bearing mothers in the Kantha Bopha maternity clinic! We hypothesize, that these mothers are carriers of inactive or "sleeping" TB residues which are becoming active toward the end of pregnancy due to a physiological immune suppression aimed at preventing the reactive abortion of the fetus as a "foreign body". We further hypothesize that this mechanism leads to circulation of activated TB bacilli in the bloodstream and, thus, to infection of the newborn by TB. Further investigation of this hypothesis using the new imaging technology of MRI/MRS is part of our work in progress in view of ultimately preventing TB in infants which is so disastrous in the poor world.

**All this work at the Kantha Bopha Hospitals could only be done thanks your loyal and generous financial contribution on which it remains dependent. Each CHF, USD or EUR is essential in our effort to heal and prevent disease and to save lives. With our sincere thanks,**