

NEM IN CAMBODIA

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INTRODUCTION

In September 2009, I traveled to Sihanoukville on the Gulf of Thailand in Cambodia to work with M'Lop Tapang. M'Lop Tapang is an NGO providing community and primary health care to more than 2,000 disadvantaged children, such as street children and those whose families live in squatters camps. M'Lop Tapang does an incredible job supplying medical, educational, social and other services to these children who have very little access to the social backup taken for granted in the developed world. Many children with acute diseases must be transferred to Phnom Penh (four hours by road) for treatment and most local medical care, including routine vaccinations, is simply too expensive for these families. During my stay I saw many children with acute and chronic illnesses that are typical in the developing world. Tackling nutritional and environmental problems is key to helping children in the long term and this article presents some of the NEM work we undertook. Our medical practice, OT&P, now has a program for regularly sending practitioners to M'Lop Tapang.

MALNUTRITION

M'Lop Tapang has an excellent in-patient and out-patient system in place to treat malnutrition in children. Kwashiorkor (protein malnutrition) is common in infants that are weaned from breast-feeding onto cheap sugar based milk formulae. Once identified these children are often admitted and put on a feeding program that includes healthy formula and a rice porridge-based supplement. We carried out element testing on a sample of malnourished children and found them to be both iron and zinc deficient, a common problem in the developing world. We also found zinc and iron deficiency in older children with growth delay. We have now added iron and zinc supplementation to the feeding program for malnourished children of all ages.

Many of the children have chronic dermatitis, mostly due to fungal and bacterial infections combined with malnutrition. I wondered whether finding a healthy source of fatty acids would be beneficial for their skin, and we decided to try giving these children supplements of coconut oil, a locally available source of omega three fatty acids. Although coconuts are plentiful in Sihanoukville, M'Lop Tapang were not able to source the oil.

Fortunately the cooking staff at the M'Lop Tapang main centre were able to set up a program of extracting oil from raw coconut shavings and I have included some pictures of how this process works. The coconut oil has been a great success in practice. According to Hannah McLean, a nurse practitioner at M'Lop Tapang, "We have seen greatly improved skin integrity for all kids that have consistently been on the daily coconut oil. We have found in the more severe cases the effects were noticeable very quickly. After just a week, there was a noticeable difference."

AIR POLLUTION FROM COOKING

I was asked to look at some children from one squatter village where the medical staff of M'Lop Tapang had identified a high incidence of chest disease. A walk around the village revealed that the huts had no ventilation to clear smoke from their indoor wood cooking stoves. These indoor stoves can cause intense levels of air pollution and are responsible for around one million deaths yearly in children worldwide, which is more than malaria and mainly caused by chest diseases such as pneumonia and tuberculosis. M'Lop Tapang has now put in place a public health education program to decrease exposure to indoor air pollution.

SANITATION

Most of the squatter villages have no basic sanitation such as mains water, washing or toilet facilities. Water usually comes from shallow wells and the surrounding area is randomly used for toileting. In some villages on the sea, the rainwater washes excreta back down into the village. Currently, if worm infestation is suspected in a child, they are empirically treated with Albendazole. We collected single random stool tests on five children, preserved the specimens with formalin and had them examined at Doctors Data. These revealed the following:

Child 1: Hookworm, *Ascaris Lumbricoides*, *Trichuris Trichuria*

Child 2: Hookworm, *Ascaris Lumbricoides*, *Dientamoeba Fragilis*, *Giardia Lambia*

Child 3: No parasites seen

Child 4: *Dientamoeba Fragilis*

Child 5: *Ascaris Lumbricoides*, *Trichuris Trichuria*, *Giardia Lambia*, *Blastocystis Hominis*

It is politically difficult to provide clean water and sanitation for

continued next page



M'lop Tapang staff show how they make a batch of coconut oil.

A. Fresh shaved coconut is purchased at the market (12kg for US\$3). About 3 litres of filtered water is added.

B. The wet shaved coconut is put into a small cotton bag.

C. The bag is pressed many times until the coconut water is expressed. This step is repeated two times to get as much coconut water as possible.

D. The coconut water is boiled continuously for about six hours, stirring often to prevent burning.

E. After about six hours, the coconut milk becomes oil. The oil is extracted by pressing on the coconut milk solids, which can be used to make desserts.

F. The result is about 1½ litres of coconut oil.



- 1: This 13 year old girl has chronic growth failure, probably due to malnutrition. She weighs 17kg and is 120cm tall.
- 2: An indoor wood burning stove.
- 3: Working at an outreach clinic.
- 4: A squatters hut with no windows. This is the village with high levels of respiratory disease from indoor cooking.
- 5: M'Lop Tapang main centre. M'lop Tapang has 140 employees of whom 98% are Cambodian.
- 6: A public health poster on indoor cooking. M'Lop Tapang have translated this into Khmer.
- 7: At first glance this child seems quite healthy. However she has Kwashiorkor (protein malnutrition). The chubby appearance is due to subcutaneous oedema. She has hepatosplenomegaly and the usual desquamating rash of Kwashiorkor, to which Gentian Violet has been applied.

from page 3

these villages, but clearly it is a pressing concern that they gain access to these basic necessities. In the future we will try to find acceptable ways to tackle this problem, such as building simple latrines. M'Lop Tapang does have a good microscope and over the next few months we are planning to help them train staff in order to examine stool specimens for parasites and worms. This will allow targeted treatment.

LEAD

As part of our Doctors Data whole blood element tests, we received blood lead levels on 14 children. These were generally in the 3 to 9 mcg% range, but one child had a blood lead level of 20mcg% and another a level of 62mcg%. 62mcg% is indicative of severe lead toxicity. Arsenic levels were also slightly elevated and we initially suspected that the drinking water might be contaminated with heavy metals. However, testing of drinking water in 20 different locations did not show high lead or other toxic element levels. As the villages are not connected to mains electricity, lead acid batteries are the chosen form of power for lighting. These batteries are stored in the huts. We had diagnosed the child with the high lead level as CHARGE Syndrome with significant mobility problems. The child spent a significant amount of time on the ground in their hut. Our hypothesis is that this caused exposure to spillage from the lead acid batteries. M'Lop Tapang are now putting in place a program to help families prevent lead poisoning and they are sourcing lead testing kits in order to accurately identify sources of lead.

AUTISM

In my practice I see many children with autism and I found it interesting that despite gut problems, nutritional problems and heavy metal problems, M'Lop Tapang staff have only identified one child with autism in their whole population, and he is high functioning. One out of 2,000 is a much lower incidence than in most western populations and, given that M'Lop Tapang are the only health care providers, I doubt if any others would have been missed. One explanation could be that the children have higher (protective) Vitamin D levels. However, we measured Vitamin D in 11 children and found a range of 17.8ng/dl to 42.8ng/dl with a mean 27.3ng/dl. These levels are not far different from western populations. It would be interesting to try and identify an environmental factor in Sihanoukville that protects these children from autism, or perhaps an environmental trigger that is missing.

Our involvement with M'Lop Tapang has been immensely positive for OT&P and it really has been a joy to be able to help these warm and grateful people. Hopefully, tackling the nutritional and environmental issues that have been identified will benefit large numbers of children in a sustainable way. If you would like any more information please contact me at trodd@otandp.com.

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