

# Children, AIDS and nutrition: an experience from Chiang Mai, Thailand

Prasong Tienboon<sup>1</sup> MD(Chiang Mai), Mark L Wahlqvist<sup>2</sup> MD(Adel), MD(Uppsala), FRACP

1. Department of Pediatrics, Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand

2. Department of Medicine, Monash Medical Centre, Clayton, Victoria, Australia

This paper on the experience in Chiang Mai, Thailand, highlighted some of the features of the nature of the paediatric human immunodeficiency virus infection. In Chiang Mai, the incidence of positive HIV tests in pregnant women was 1-2% and the perinatal transmission rate was approximately 40%. One particular characteristic of HIV infection in Chiang Mai is the association with *Penicillium marneffe* skin infection. Common clinical features of HIV-infected children are similar to protein energy malnutrition. Once malnutrition occurs in HIV-infected children, the disease deteriorates and the prognosis is worsened. In order to reduce morbidity and mortality in Thai HIV-infected children, early and aggressive nutrition support seems to be a crucial factor in their management. However, Thailand is in a difficult situation as the country is already trying to eradicate malnutrition in children, pregnant and lactating women and is now faced with the added burden of dealing with the secondary malnutrition resulting from the HIV/AIDS epidemic. A preliminary study of 24 HIV positive children (12 boys, 12 girls) aged 1-26 months admitted to the Chiang Mai University Hospital was conducted. Eighty-eight percent of the subjects were malnourished, and a quarter had percent weight for age less than or equal to 60% (third degree protein energy malnutrition). Five (21%) subjects had birthweights less than or equal to 2,500g. To date, over 100 cases of paediatric HIV have been admitted to the Chiang Mai University Hospital. Nutrition plays an important role in HIV infection. Further research is urgently needed in various areas of nutrition and paediatric HIV/AIDS to improve clinical care. A case history of paediatric AIDS was also shown.

## Introduction

Paediatric HIV infection has been associated with transmission from contaminated blood products. With improved screening and processing of blood products, future spread of HIV via such channels is unlikely. Instead, the world is experiencing a still rising prevalence of HIV infection in women. Vertical transmission of infection to the infants of these women will set the scene for the nature of paediatric HIV infection that we will experience. This paper on the experience of paediatric HIV infection in Thailand highlighted some of the features of the changing nature of the epidemic. Whilst the health and living standards in most of developed countries cannot be equated with those in Thailand, many other features may have similarities.

## Epidemiology

Acquired Immune Deficiency Syndrome (AIDS) was first reported in children in 1982 in the United States and in 1984 in Europe. The World Health Organisation (WHO) has estimated that more than 12 million people in 150 countries, are currently infected with the Human Immunodeficiency Virus (HIV). Over one million of these are children. In the United States and Europe, infants and children under 13 years of age account for only two percent of all AIDS cases, while in the developing countries such as Asia, Africa and the Caribbean, children account for 15-20% of AIDS cases. As HIV continues to spread into the heterosexual population, it is expected that paediatric AIDS will become an ever greater problem in both developed and developing countries.

Thailand, with a population of 60 million, had at least 600,000 HIV-infected people at the end of 1994. However, 90% of these were still asymptomatic. Chiang Mai, the northern regional centre, has a population of 1.5 million and the highest prevalence of HIV infection in Thailand. In Chiang Mai, the first full blown AIDS case (a male prostitute) was reported by the Chiang Mai University Hospital in 1987 (the third reported case

of AIDS in Thailand). The incidence of positive HIV tests in pregnant women was 1-2% and the perinatal transmission rate was estimated to be approximately 40%<sup>1,2</sup>. In 1989 the first case of a positive HIV test in a child (from a hilltribe) in Chiang Mai was documented<sup>3</sup>. One particular characteristic of HIV infection in Chiang Mai, is the association of *Penicillium marneffe* skin infection and HIV infection. Chiang Mai is an area where the prevalence of *Penicillium marneffe* infection in the HIV population has been reported to be one of the highest in the world<sup>3,4</sup>. In Thailand, it is common for men to visit prostitutes, usually for their first sexual experience at around 14 or 15 and even after they are married. Much of the spread of infection to women and children stems from this practice. Prostitution in Thailand is driven by simple poverty, as well as cultural practices. It seems that Chiang Mai is faced with an increasing problem of an HIV positive population in the near future and that the whole country is facing an incredible AIDS problem. It has been estimated that in the next 10-15 years, Thailand will lose about 10% of the work force aged 15-25 years from AIDS with an increasing number of paediatric AIDS. Thailand is actively addressing the issue of AIDS. In countries such as India, Indonesia, Nepal and Vietnam the seroprevalence rate is currently unknown.

## Paediatric nutrition problems in Thailand

Even though Thailand is a major agricultural exporting country (rice, corn, legumes, sugar, chicken, beef, pork, seafood and fruits), nutritional deficiencies are major problems, particularly among preschool & school-aged children, pregnant and lactating women. This is because of poverty, inappropriate food habits,

**Correspondence address:** Dr. Prasong Tienboon, Department of Pediatrics, Faculty of Medicine, Chiang Mai University, Chiang Mai 50200 Thailand

Tel: +66-53-221122 Fax: +66-53-895269

Email: prasong@chiangmai.ac.th

lack of nutritional awareness and poor environmental conditions. Thailand has successfully reduced the magnitude and severity of certain nutrition problems such as protein energy malnutrition (PEM) in preschool children (29% in 1988 to 15% in 1991 and 13% in 1994) as well as school children (27% in 1988 to 19% in 1991)<sup>5</sup>. PEM is here defined as percent weight for age less than 90%. Other nutrient deficiencies include vitamin A, B1, B2, iodine and iron. As well as nutritional problems associated with developing countries, Thailand, like the developed world, is also facing a growing problem of chronic nutritionally related disease such as coronary heart disease, stroke and obesity. The seeds of these problems are being sown in childhood nutritional practices.

#### Nutrition & AIDS and its consequence in Thailand

The vicious cycle of infection and malnutrition is played out constantly in many parts of Thailand. The clinical syndrome of AIDS adds further to this picture. Pre-existing malnutrition is common in Thai children and HIV infection may itself produce malnutrition. The effects of each are additive. Common clinical features of HIV-infected children are similar to protein energy malnutrition and include fever, diarrhoea, failure to thrive, fat & lactose malabsorption, immune suppression and other specific nutrient deficiencies such as vitamin A, B 1, B2, zinc and selenium. Once malnutrition occurs in HIV-infected children, the disease deteriorates and the prognosis is worsened. In order to reduce morbidity and mortality in Thai HIV-infected children, early and aggressive nutrition support seems to be a crucial factor in their management. However, Thailand is in a difficult situation the country is already trying to eradicate malnutrition in children, pregnant and lactating women and is now faced with the added burden of dealing with the secondary malnutrition resulting from the HIV/AIDS epidemic.

#### A Chiang Mai experience

There are two major modes of transmission of HIV to infants and children, vertical transmission and blood transfusion. Most children who test positive for HIV have received the virus through vertical transmission. Those children infected via blood transfusion were mainly thalassaemia cases. Haemophilia is uncommon in Chiang Mai. The seroprevalence rate was observed to be about 5% in one private children's hospital in Chiang Mai, but it is thought to be higher in the general population. In clinical practice, screening for HIV infection is now considered routine for any child who presents with a fever and chronic diarrhoea.

#### Methods

A study of 24 HIV positive children admitted to the Chiang Mai University Hospital, the largest hospital (1,500 beds) in the northern part of Thailand, was conducted. All patients were admitted for further management, without prior knowledge of being HIV positive, with symptoms of fever, chronic diarrhoea, failure to thrive, pneumonia, hepatosplenomegaly or a combination of these diseases. All were diagnosed as having a positive HIV test on admission. There were 12 girls and boys in the study. Thirteen (54%) died and 11 (46%) remained alive. The mean age on admission was 7 months (SD: 6 months; range: 1-26 months). Intensive nutrition support was given to all patients because, in HIV infection, there is not only fat and carbohydrate malabsorption but also other specific nutrient deficiencies. Nutrition counselling to the parents on healthy eating was provided in the hospital. The nutritional considerations are presented here.

#### Results

The mean age of the mothers was 23.9 years (SD: 4.15 y; range: 17-34 y) and of the fathers was 30.2 years (SD: 5.71 y; range: 21-

41 y). Of the 24 study mothers, 4 were involved in prostitution and the rest were either housewives or labourers. All mothers and children had positive HIV tests done in the hospital when the patients were admitted to the hospital. The 24 study fathers were all heterosexual and all had a history of visiting prostitutes. All the fathers were labourers and only 2, both of whom had partners who were prostitutes, tested negative for HIV. However, all parents studied were asymptomatic. The mean birthweight of the 24 subjects was 2,700g (SD: 416g; range: 1900-3580g). The average birthweight for normal Thai infants is 3,007g for boys and 2,923g for girls<sup>6</sup>. Mean weight on admission was 4.9kg (SD: 1.34 kg; range: 2.6-7.7 kg). The mean percent weight for age (% W/A), based on the National Centre for Health and Statistics (NCHS) reference data, was 72% (SD: 14%; range: 44-105%). Eighty-eight percent (n = 21) of the subjects were malnourished (Table 1), a quarter (n = 6) had percent weight for age less than or equal to 60% (third degree protein energy malnutrition - Table 1). Five (21%) subjects had birthweights less than or equal to 2,500g and 15 (63%) had birthweights between 2,501-3,000g.

**Table 1.** Number of subjects according to their nutritional status (% W/A) on admission

%W/A	Dead	Live	Total
>90	2	1	3
75.1-90	6	2	8
60.1-75	3	4	7
<60	2	4	6
<b>Total</b>	<b>13</b>	<b>11</b>	<b>24</b>

#### Discussion

In the present study malnutrition was an important factor associated with paediatric HIV infection. This association was mostly disregarded by the parents of these HIV infected children. Parents were interviewed about the general eating habits and food intake of these families. It was observed that, for the parents, nutrition was not an important issue and this was probably related to poor general education, with poor nutritional knowledge, and to poverty. Paediatric HIV infection is increasing rapidly and Chiang Mai will have one of the highest prevalence rates of paediatric HIV infection in Thailand. To date, over 100 cases of paediatric HIV and 400 cases of adult HIV have been admitted to the Chiang Mai University Hospital. Nutrition plays an important role in HIV infection. Further research is urgently needed in various areas of nutrition and paediatric HIV/AIDS to improve clinical care. In Thailand, strategies for improving nutritional status in HIV infected children are hampered by problems such as pre-existing malnutrition, lack of nutritional knowledge and poverty.

#### Paediatric AIDS in Chiang Mai - a case history

A 2-month-old Thai girl was admitted to the Chiang Mai University Hospital with a one week history of diarrhoea. Two weeks prior to admission, it was noticed that she had a fluctuating fever. An upper respiratory tract infection was diagnosed by a general practitioner. As the father had a chronic cough, the baby's mother thought that the baby had a similar problem. One week later the baby developed diarrhoea with frequent mucoid loose yellowish-green stools, 5-6 times a day. In addition to breast milk, the parents gave her some boiled rice to help treat the diarrhoea. However, the infant's condition deteriorated and she was taken to the hospital. She was a first baby, born at 39 weeks gestation. Her birthweight was 3,280g, length 48cm, occipito-frontal circumference (OFC) 33cm. The Apgar score at birth was 8. The child was breastfed and also fed with commercial infant formula (Lactogen), boiled rice, mashed banana twice a day. Routine BCG and Hepatitis B vaccination had been given at birth. Both parents

were 23 years old and were diagnosed HIV positive when the mother was 3 months pregnant. They were both currently asymptomatic. The father was a labourer and, like many Thai men, frequently visited prostitutes. On admission, the baby was febrile with a temperature of 38° Celsius, pulse rate 120 per minute, respiratory rate 40 per minute and blood pressure 70/40 mmHg. The weight was 3,790g, (percent weight for age 97%, percent weight for height 95% and percent height for age 98%). The OFC was 36.5 cm and percent OFC for age was 99%. She appeared moderately dehydrated with sunken anterior fontanelle and was drowsy. She was mildly icteric but there was no pallor. There was generalised non-tender lymphadenopathy. Four umbilicated infected ulcers were present on her face. She had oral thrush. Hepatosplenomegaly was present. Further examination was unremarkable.

#### Laboratory investigations

- Enzyme-linked immunosorbent assay (ELISA) test for HIV was positive.
- Direct smear from face ulcer was positive for mycelium and on culture *Penicillium marneffe* was identified.
- Liver function tests: GOT 180 mg/dl, GPT 150 mg/dl, direct bilirubin 1.2 mg/dl, total bilirubin 2.9 mg/dl.
- Stool examination: mucus, yellowish and green loose stools with fat droplets. Occult blood was negative and no parasite ova were detected.
- Full blood count: haemoglobin 10.6 g/dl, haematocrit 32%, white blood cell count 14,500 /mm<sup>3</sup> with neutrophil 46%, lymphocyte 54%. The platelet count was 237,000 mm<sup>3</sup> and normal appearance of red blood cell on the smear.
- Urine examination: yellow, clear, pH 6, specific gravity 1.003, no casts, no white blood cell nor red blood cell. Protein and sugar were negative.

- Lumbar puncture: no cells, protein 50 mg/dl, sugar 50 mg/dl.
- Chest X-ray: normal.
- Electrolytes: sodium 133 mol/L, potassium 3.0 mol/L, chloride 100 mol/L, bicarbonate 17 mol/L.
- Blood urea: 8 mg/dl.
- Fasting blood glucose: 83 mg/dl.

#### Discussion

This baby is an example of a Thai AIDS case born to a HIV positive family. The characteristics were as follows: The parents are young adults who are both HIV positive and currently asymptomatic. The heterosexual father frequently visited prostitutes and had transmitted the virus to his wife. The family is of poor socioeconomic status with limited education and limited financial resources. Knowledge of infant feeding was poor, as exemplified by feeding a young baby solids, in response to illness. The infant was born at term with a normal birth weight. She appeared to be in a reasonable nutritional state as both weight and height were still within the normal range for age. Her presentation with fever, diarrhoea and generalised lymphadenopathy are common presenting symptoms of paediatric AIDS in Thailand. *Penicillium marneffe* skin infections are recognised as being associated with AIDS in Thailand. This baby's diarrhoea was associated with fat malabsorption. She is at risk of development of nutritional deficiencies and failure to thrive in the future. The absence of these at presentation probably relate to the short period of illness.

Further management of this child and family will need to address issues such as nutrition education and aggressive nutrition support. Financial support may also be necessary for this family to achieve these goals.

### Children, AIDS and nutrition: an experience from Chiang Mai, Thailand

Prasong Tienboon, Mark L Wahlqvist

*Asia Pacific Journal of Clinical Nutrition* (1996) Volume 5, Number 2: 84-87

## 兒童、艾滋病 (AIDS) 與營養： 泰國清邁市 (Chiang Mai) 的經驗

### 摘要

該文重點討論了泰國清邁市兒童艾滋病的特徵。清邁市孕婦 HIV 陽性率是 1-2%，產期的傳播率約 40%。清邁市 HIV 傳染是與青霉素皮試有關。HIV 感染兒童的一般臨床特徵和蛋白質能量營養不良相似。HIV 感染兒童一旦出現營養不良，病情隨而惡化，預後不良。為了減少泰國 HIV 感染兒童的發病率和死亡率，早期積極的營養補充在病情處理上似是一個重要因素。泰國已試圖根絕兒童、孕婦和授乳婦女的營養不良，但目前又面對 HIV/AIDS 流行而引起的營養不良，因而處境是困難的。清邁大學醫院選取了年齡 1-26 個月的 24 位 HIV 陽性兒童 (12 男童, 12 女童) 作初步研究，其中 88% 研究對象為營養不良，按體重、年齡計算，有四分之一兒童低於或相當於正常兒童的 60% (三度蛋白質-能量營養不良)。其中 5 個對象 (21%) 出生體重少於或相當於 2500 克。目前清邁大學醫院接收了百多例 HIV 兒童，營養在 HIV 感染中起重要作用，從不同角度進一步研究營養和改進 HIV/AIDS 兒童的臨床護理是急需的。該文報告了一例兒童愛滋病。

Children, AIDS and nutrition: an experience from Chiang Mai, Thailand

Prasong Tienboon, Mark L Wahlqvist

*Asia Pacific Journal of Clinical Nutrition* (1996) Volume 5, Number 2: 84-87

# โภชนาการกับผู้ป่วยเด็กโรคเอดส์

ประสงค์ เทียนบุญ พ.บ. และ มาร์ค วัลควิส พ.บ.

ในประเทศไทย ผู้ป่วยเด็กโรคเอดส์มักได้รับเชื้อมาจากมารดา โดยมีอุบัติการณ์ของการทดสอบภูมิคุ้มกันต่อเชื้อเอชไอวีให้ผลบวกประมาณ 1 - 2 % และทารกที่คลอดจากมารดาเหล่านี้ มีโอกาสเป็นโรคเอดส์ประมาณ 40% รายงานนี้ ได้ทำการศึกษาเบื้องต้นถึงภาวะทางโภชนาการของผู้ป่วยเด็กโรคเอดส์จำนวน 24 คน (ชาย 12, หญิง 12) อายุ 1 - 26 เดือน ที่รับไว้รักษาในโรงพยาบาลมหาราชนครเชียงใหม่ ประเทศไทย พบว่า 88% ของผู้ป่วยมีภาวะขาดโปรตีนและพลังงาน และ 25% มีภาวะขาดโปรตีนและพลังงานอย่างรุนแรง 21% ของผู้ป่วยมีประวัติคลอดน้ำหนักตัวน้อยกว่า 2,500 กรัม ดังนั้น โภชนาบำบัดมีความสำคัญมากกับผู้ป่วยโรคนี้ ผู้เขียนได้รายงานถึงผู้ป่วยตัวอย่าง 1 ราย

## References

1. Tienboon P. Iron status and anemia of pediatric patients with Human Immunodeficiency Virus infection. *Chiang Mai Med Bull* 1994; 33(3): 58-59.
2. Vithayasai V, Vithayasai P. The status of HIV infection in Maharaj Nakorn Chiang Mai Hospital. *Chiang Mai Med Bull* 1991; 30: 195-200.
3. Supparatpinyo K. *Penicilliosis marneffei*: report of three cases from Maharaj Nakorn Chiang Mai. *Chiang Mai Med Bull* 1990; 29: 27-32.
4. Supparatpinyo K. *Penicillium Marneffei* infection and AIDS. *J Infection & Antimicrobial Drug* 1991; 8: 121-124.
5. Nutrition Division, Department of Health, Ministry of Public Health, Thailand. Nutrition surveillance data 1982-1991.
6. Tienboon P, Rutishauser IHE, Wahlqvist ML. Seasonal variation of somatic growth at birth. *Proc Nutr Soc Aust* 1986; 11: 143.