Short-term Follow-up of HIV-1 Infected Children Without Treatment: Use of CD4/CD8 Ratio as a Marker of Disease Progression

We aim to study the short-term natural progression of human immunodeficiency virus (HIV) infection in children who are not on antiretroviral therapy (ART) and role of CD4/CD8 ratio as a possible marker for tracing short-term HIV disease progression. Several studies on progression of HIV infection and CD8 count [1–3], and progression of HIV infection and CD4 count [4] have been done, but very few have evaluated for CD4/CD8 ratio [5].

The study group includes 32 children (aged 0.9–15 years), who presented in the year 2006–07 to the paediatric and perinatal HIV out-patient department (OPD) at our tertiary care centre in Mumbai, India with established perinatally acquired HIV infection. Only HIV infected children who were unable to afford ART or those who did not need ART were included in this retrospective, analytical study. Since conventional markers like CD4 and viral count are regularly monitored (typically once every 3 or 6 months), short-term estimates of disease progression are arguably clinically more relevant than long-term predictions [6].

In a sample of 32 children, on first visit 21 (65.6%) children were advised ART on the basis of CD4 count and CD4% in accordance with World Health Organization (WHO) (2007) guidelines [7]. A viral load of more than 100 000 copies ml$^{-1}$ was also considered as a marker for initiating therapy [8]. Due to inability to afford treatment, none of these children took ART and yet it was seen that 68.75% of these children showed improvement or no change in immune category after 6 months.

CD4/CD8 ratio was found to predict the worsening or improvement/no change in immune category of children within 6 months ($p=0.030$). Those with an improvement or no change in immune category had a mean ratio of $0.6\pm0.3$ and those with a worsening of immune category had a mean CD4/CD8 ratio of $0.4\pm0.3$. Children with worsening of immune category had a consistently lower and faster decreasing CD4/CD8 ratio than those with improvement/no change in immune category (Table 1).

Variance of CD4/CD8 ratio with age groups was not statistically significant ($p=0.248$).

The changes in immune category was found to be independent of age ($p=0.464$), gender ($p=0.446$), baseline immune category ($p=0.324$), opportunistic infections ($p=0.811$) and baseline CD4 ratio ($p=0.654$) or CD4% ($p=0.110$) or baseline WHO staging ($p=0.058$).

CD4/CD8 ratio can be a potential adjuvant marker. It can be calculated simply by flow cytometry and can prove to be of immense value in resource limited settings.

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<th>Immune category and various parameters</th>
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<td>Mean ± SD ($n=22$)</td>
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<td>Age (years)</td>
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<td>Baseline viral load (copies ml$^{-1}$) ($n=4$)</td>
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<td>Baseline CD4 (cells mm$^{-3}$)</td>
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References

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**Hand-touch Method for Detection of Neonatal Hypothermia in Nepal**

**Summary**

Neonatal hypothermia is the fourth leading causes of neonatal death in Nepal. Thus, it is the caregivers’ responsibility to identify the hypothermia by using valid and less time consuming method like hand-touch method. Therefore, we examined the diagnostic validity of hand-touch method against low-reading mercury (LRM) thermometer for detecting neonatal hypothermia. We assessed neonate’s temperature first by hand-touch method, then by LRM thermometer and tympanic thermometer among 100 full-term neonates, delivered within 24 h in Maternity Ward of Tribhuvan University Teaching Hospital, Nepal. We used World Health Organization (1997) criteria for classification of neonatal hypothermia. The sensitivity and specificity of the hand-touch method for detection of neonatal hypothermia were 95.6% and 70.1% against LRM thermometer and 76.6% and 83% against the tympanic thermometer, respectively. Touching method is practical and therefore has a good diagnostic validity; it can be introduced in essential newborn care package after giving adequate training to caregivers.

**Key words:** neonatal hypothermia, hand-touch method, Nepal.

**Introduction**

Neonatal hypothermia is a common problem particularly in developing countries, causing high neonatal morbidity and mortality [1]. WHO recognizes newborn thermal care as a critical and important component of essential newborn care. However, hypothermia continues to remain under-documented, under-recognized and under-managed [2]. The incidence of neonatal hypothermia is as high as it is 67.6% in Nigeria [3], and 43% among normal weight infant in India [4]. The incidence of neonatal hypothermia is also high in Nepal as 87% of neonates had <35.5°C rectal temperature in first 24 h [5] and 85% of neonates are hypothermic within 2 h of birth [6] in Maternity Hospital, Kathmandu. According to Nepal’s National Neonatal Health Strategy 2004, hypothermia is the fourth leading cause of neonatal death [7] with 16% of hypothermic neonates (<36°C) die during the first week after birth [8]. Hypothermia also carries a high neonatal morbidity due to increase risk of respiratory distress, metabolic acidosis and jaundice [9].

It is the health workers and caregivers’ responsibility to assess the newborn’s temperature by valid method. Low reading mercury (LRM) thermometer is considered best and gold standard for measuring hypothermia since its invention [2]. LRM thermometers are, however, fragile and potential for mercury vapor toxicity following breakage [10] and difficult to obtain in many parts of the world [11]. Nowadays, developed countries used tympanic thermometers, electronic thermometers and digital thermometers to measure neonatal temperature. However, these thermometers are unaffordable and impractical in many developing countries, like Nepal.

Hand-touch method is simple, practical and inexpensive method, which has been promoted for assessing neonatal hypothermia in resource poor countries [12]. There are only few studies on diagnostic accuracy of this method compared with clinical thermometer [13] and digital thermometer [14]. These studies excluded the neonates with body