A quarter of all deaths in children aged ≤ 5 years are caused by diarrhea [1]. In 3–20%, diarrhea persists often due to malnutrition or parasitological infection [2]. In case of accumulated oxidative metabolites in the digestive system, a link to intestinal inflammatory processes is discussed [3]. The organism copes with oxidative stress by releasing glutathione (GSH). GSH formation depends on the cysteine supply usually met by endogenous synthesis. In this study, we assessed the effect of N-acetylcysteine (NAC) on the course of chronic diarrhea in children. Because of its thiol group, NAC, a mucolytic agent, acts as an antioxidant, and it is a cysteine donor [4]. The investigation took place from 2002 to 2005 in the Department of Paediatrics at the Federal University of Bahia, Brazil. Children aged between 2 and 36 months who had diarrhea for 14–60 days, suffered undernutrition with a weight-for-height SD (z-score) of >2, and for whom a written informed parental consent was received were eligible for inclusion [5]. The exclusion criteria were chronic diseases, congenital disorders, edema and exclusive breast feeding. A total of 44 children were included and randomly distributed between a study group (n = 22) and a control group (n = 22) comparable in composition of age, gender and clinical characteristics (Table 1). NAC was given in a total daily dose of 200 mg, in addition to the common therapeutic diet. At study admission, we took a full blood count, conducted a biochemistry lab test and screened for an underlying HIV infection. Feces were tested for parasitological and viral infection. On admission and discharge, we assessed the total anti-oxidant status (TAOS) in venous blood, an overall indicator for plasma anti-oxidants [6]. Body weight, intake of liquids (oral rehydration solution, water) and output of body fluids (stool, urine and vomit) were continually measured and recorded at 24-h intervals. The duration of diarrhea after the first intake of NAC showed an arithmetic mean of 28.3 ± 32.8 h in the study group and 26.0 ± 31.4 h in the control group (p = 0.28). A total stool output of 126.8 ± 130.5 g kg\(^{-1}\) body weight was measured in the study group, whereas the control patients provided a TAOS of 119.9 ± 120.9 g kg\(^{-1}\) (p = 0.21). In the study patients, the TAOS was 1.20 ± 0.29 mM at admission and 1.25 ± 0.24 mM at discharge. The control patients provided a TAOS of 1.17 ± 0.32 mM at admission and 1.22 ± 0.27 mM at discharge (p = 0.44). In conclusion, the results of our study did not indicate any statistically significant difference between the groups. The patients included might have been equipped with sufficient anti-oxidant capacity owing to their moderate level of malnutrition. Having a larger number of patients in severe malnourished condition could possibly reveal clearer results in further studies.

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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 ± 0.3 and those with a worsening of immune category had a mean CD4/CD8 ratio of 0.4 ± 0.3. 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.

**Table 1**

<table>
<thead>
<tr>
<th>Immune category and various parameters</th>
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<tbody>
<tr>
<td>Mean ± SD ( (n = 22) )</td>
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<tr>
<td>Age (years)</td>
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<tr>
<td>Baseline viral load (copies ml⁻¹) ( (n = 4) )</td>
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<tr>
<td>Baseline CD4 (cells mm⁻³)</td>
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<tr>
<td>Baseline CD4%</td>
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<tr>
<td>Baseline CD4/CD8</td>
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<tr>
<td>Mean drop in CD4/CD8</td>
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