Brief Reports
Malaria Parasitaemia in Neonates in Port Harcourt, Nigeria

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Summary
Malaria is thought to be rare among neonates in malaria-endemic regions. Consequently, blood film for malaria parasite is not routinely included in the sepsis screening protocol for neonates. We examined the role of malaria in perinatal morbidity among neonates admitted into our unit with a view to determining the need or otherwise of including malaria parasitaemia in the sepsis work-up in suspected neonatal sepsicaemia. Fourteen babies who met our preset criteria were screened for malaria parasitaemia out of which five (35.71 per cent) had positive blood smears for Plasmodium falciparum. Eighty per cent of the neonates presenting with fever had positive blood films (Yates corrected $\chi^2 = 3.9822; p = 0.04$). All the babies responded to an oral course of chloroquine. These data have further highlighted the importance of malaria in perinatal morbidity in our environment. We recommend a multi-centred study to define clearly the role of malaria in perinatal and neonatal morbidity and mortality in malaria endemic areas.

Introduction
The launching of the Roll Back Malaria initiative in 1998 rekindled interest in malaria, a leading cause of morbidity and mortality among children in developing countries. Unfortunately, the importance of malaria in perinatal morbidity and mortality has received little attention. In many centres in Nigeria, blood film for the malaria parasite is not part of the protocol for sepsis screening for neonates. It is assumed that malaria is so uncommon in neonates that it does not merit special investigation, despite several reports to the contrary.2–6

Ibhanesebhor and Okolo7 have shown that the signs of neonatal malaria are indistinguishable from those of neonates with bacterial infection, and therefore suggested a high index of suspicion of malaria in critically ill babies. In our practice, we have often seen babies on treatment for neonatal sepsis continue to have persistent fever, despite adequate and appropriate antibiotic treatment who respond to a therapeutic trial with chloroquine. To our knowledge, however, there has been no study in Port Harcourt that has investigated the role of malaria in perinatal or neonatal morbidity and mortality. Such a study may highlight the need or otherwise of the inclusion of blood film for the malaria parasite in the protocol for sepsis screening of neonates, which could help to reduce unnecessary deaths.

The present study is a pilot study aimed at determining the role, if any, of malaria in perinatal morbidity in Port Harcourt, southern Nigeria, explore the importance of malaria as a cause of neonatal fever, and determine the need or otherwise of including malaria parasitaemia in the septic work-up in suspected neonatal sepsicaemia.

Materials and Methods
Babies admitted in April 2002 to the special care baby unit of the University of Port Harcourt Teaching Hospital, Nigeria, before the seventh day of life, and who had not received blood transfusion prior to presentation were recruited into the study. These were screened for malaria parasitaemia, blood film samples being obtained during blood collection for routine investigations. An aliquot of this same blood was stored in an EDTA specimen bottle and sent to the hospital’s microbiology laboratory for thick and thin blood film for malaria parasite. The level of parasitaemia was graded as negative, low density (+), medium density (++), and high density (+++). The age, birthweight, and reasons for admission were noted. Because of the scope of the study, no attempt was made to determine whether the mothers received antimalarial prophylaxis, nor was the presence of placental parasitaemia explored. The data generated were analysed using proportions, and Yates corrected $\chi^2$ test.

Acknowledgements
We gratefully acknowledge the assistance of the Residents and nursing staff of the Special Care Baby Unit and the Laboratory staff of the Microbiology Department.

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Results

A total of 72 babies were admitted during the period under study, 40 males (55.56 per cent) and 32 females (44.44 per cent); 14 (20 per cent) patients were screened for malaria parasites (nine males and five females). Of the 14 that were screened, five (35.71 per cent) were positive. Table 1 shows the reasons for admission while Table 2 shows the distribution of parasitaemia in the screened population. The difference between the males and females was not statistically significant. Five of the neonates were admitted for fever out of which four (80 per cent) were malaria parasite-positive (Yates corrected $\chi^2 = 3.98222; p < 0.05$; Table 3). There was no significant difference between the birthweights of the malaria parasite-positive and malaria parasite-negative babies in this study.

Discussion

Neonatal malaria may not be as uncommon as previously thought. Eighty per cent of our subjects who presented with fever and were being investigated for possible neonatal sepsis, had malaria parasitaemia and responded to oral chloroquine. While Ibhanesebhor and Okolo investigated only critically ill babies with 'signs of progressive infection', we screened all babies regardless of their clinical state. Our findings, which were similar to theirs, therefore show that malaria is an important cause of fever in neonates in our environment, which challenges the rationale for not routinely screening for malaria in sick neonates.

The parasite density in our study population was between mild and moderate, which suggests that symptoms can still occur at low parasitaemia in neonates. This may be due to increased virulence of Plasmodium falciparum, as already suggested by earlier workers. This highlights the need to check for the malaria parasite in all cases of neonatal fevers. Because low parasitaemia levels may be difficult to pick up, repeat blood films may be necessary while the fever persists.

With a case prevalence of 35.71 per cent, and 80 per cent of all those with fever having positive blood film for malaria parasite, and considering that untreated malaria caused by $P. falciparum$ may be rapidly lethal, it would seem prudent to suggest that chloroquine should be given routinely to all neonatal fevers with fever while awaiting blood film results. Malaria is also an important cause of neonatal anaemia. In an already compromised baby, concomitant anaemia will worsen the prognosis further. In a malaria-endemic area therefore, where chloroquine resistance is not a problem, a presumptive treatment of all neonatal fevers with chloroquine after samples have been taken for malaria parasite will help to prevent unnecessary deaths and reduce the duration of hospitalization among neonates from possible malaria infection. It is significant that all our subjects in this study responded to chloroquine treatment.

We conclude that malaria is an important cause of fever in neonates in Port Harcourt, and contributes significantly to neonatal morbidity and mortality. Prompt diagnosis and treatment will reduce the risk of death from the complications of malaria such as anaemia and reduce the duration of hospitalization.

We recommend a larger multi-centred study to confirm these findings with a view to including routine blood film for malaria parasite in screening protocol for suspected neonatal sepsis.

References


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**Table 1**

<table>
<thead>
<tr>
<th>Reason for admission</th>
<th>Frequency (%)</th>
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<tbody>
<tr>
<td>Birth asphyxia</td>
<td>5 (35.71)</td>
</tr>
<tr>
<td>Fever</td>
<td>5 (35.71)</td>
</tr>
<tr>
<td>Offensive liquor</td>
<td>1 (7.14)</td>
</tr>
<tr>
<td>Neonatal sepsis</td>
<td>2 (14.29)</td>
</tr>
<tr>
<td>Tracheo-esophageal fistula</td>
<td>1 (7.14)</td>
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**Table 2**

<table>
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<tr>
<th>Male</th>
<th>Female</th>
<th>Yates corrected $\chi^2$</th>
<th>$p$ value</th>
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<tbody>
<tr>
<td>Positive</td>
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<td>1</td>
<td>0.1106173</td>
</tr>
<tr>
<td>Negative</td>
<td>5</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
<td>5</td>
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**Table 3**

<table>
<thead>
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<th>Fever</th>
<th>No fever</th>
<th>Total</th>
<th>Yates corrected $\chi^2$</th>
<th>$p$ value</th>
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<tbody>
<tr>
<td>Positive</td>
<td>4</td>
<td>1</td>
<td>5</td>
<td>3.982222</td>
</tr>
<tr>
<td>Negative</td>
<td>1</td>
<td>8</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
<td>9</td>
<td>14</td>
<td></td>
</tr>
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Day-care Centre Supplementary Feeding Effects on Child Nutrition in Urban Slum Areas of Nepal

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Summary
We compared the nutritional status of children aged 1–5 years from slums attending two day-care centres (DCCs) in Nepal (one in an urban slum area) with that of non-attendees to evaluate the impact of supplementary feeding. We measured the anthropometrics of 23 children attending two DCCs and 23 matched controls from the same neighbourhood and interviewed their mothers. We found a better nutritional status, particularly the height-for-age Z-score, among the attendees of the DCC with children's longer attendance, but no difference at the other, although attendees who had been fed for longer tended to show better nutrition. Our study indicates that in the least developed countries good quality day-care of sufficient duration has the potential to improve child nutrition.

Introduction
Child malnutrition in the least developed countries still remains a major public health problem with 36 per cent of under-5-year-olds underweight and 43 per cent stunted. The rates in Nepal in 2001 were 48.3 per cent and 50.5 per cent, respectively. The United Nations Children’s Fund suggested that care, in addition to food and health services, was crucial for children’s growth and development. With more mothers working, there is a need for substitute day care for young children. Despite the importance of research on child-care, most previous studies focused on maternal factors. A few that focused on the effects of day-care centres (DCCs) on children’s nutrition have shown conflicting results. Some have shown that supplementary feeding at a DCC improves children’s nutritional status, whereas other studies found no effect on growth. The effects of a DCC as a resource for care in the least developed countries are still unclear. Thus, we investigated the effects on Nepalese children’s nutrition in DCCs that provided supplementary feeding.

Materials and Methods
This study was conducted on 8–18 December 2002 in two slum areas near the central bus station in Pokhara, Nepal’s second largest city, 200 km west of Kathmandu. The area has approximately 6000 inhabitants, mostly hill people, with the majority living in poverty in unsanitary conditions.

A municipal DCC and another run by a Japanese...