**SHORT REPORT**

**Flies and *Helicobacter pylori* infection**

S J Allen, J E Thomas, N D E Alexander, R Bailey, P M Emerson

**RESULTS AND DISCUSSION**

In both groups of villages, nearly all children were breast fed (overall 98.5%) and were also receiving other fluids or food (91.8%). Overall, 133/206 (64.6%) cohort children were seen at the 6 month survey and follow up was similar in each arm (p = 0.86; table 1). Loss to follow up was due mainly to migration and death. Fly catch data were not normally distributed with many “zero” catches, particularly in the insecticide group. The maximum population of houseflies (*Musca domestica*) in the insecticide group was reduced to 25% of that in the control group (table 1).

The prevalence of *H. pylori* infection was similar in the control and insecticide groups at baseline (59.7%, 95% CI 51.0 to 68.3 and 63.4%, 95% CI 53.0 to 73.8, respectively) and follow up (79.8%, 95% CI 70.9 to 88.6 and 75.9%, 95% CI 64.5 to 87.3, respectively; table 1). The proportions of cohort children who acquired and spontaneously lost infection during the study were similar between control and insecticide groups (fig 1). Analysis by paired t test, to account for the cluster randomised design, showed that the difference in the proportion of cohort children who acquired infection in the insecticide group compared with the controls was −1.7% (95% CI: −22 to 19%). Overall, 67.2% children had received an antibiotic and 35.9% a traditional medicine during the intervention. Use of antibiotics and traditional medicines was similar in the two arms (p>0.5) and was not related to *H. pylori* status at follow up. The prevalence of infection in infants recruited at the follow up survey was similar between groups (table 1).

Our findings do not discount that *M. domestica* may be a vector of *H. pylori*. The number of children in the cohort means that the true benefit of fly control in preventing *H. pylori* infection may be as much as 22%, but is unlikely to be greater (with 95% confidence). However, the absence of any trend of reduced acquisition of infection in the cohort children or the infants, or of increased spontaneous loss of infection in the cohort children, implies that flies are neither an important reservoir of infection nor a major route of transmission in Gambian villages. Large intervention trials investigating the role of flies in *H. pylori* transmission are not warranted in this environment.

**Abbreviations:** 95% CI, 95% confidence interval; IQR, interquartile range; UBT, urea breath test

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**METHODS**

A cohort of all consenting children aged 6–18 months in 12 village clusters was recruited (table 1). Expired air was collected before and 30 min after an oral solution of 50 mg $^{13}$C-urea in clean water was administered. Children had not fasted before the procedure and no test meal was given. Isotope enrichment was detected by mass spectroscopy and a cut off of 5.5 Craig corrected delta relative to the Pee Dee belemnite limestone international standard was employed.

Flies were controlled by twice weekly ultra-low-volume space spraying with aqueous permethrin (3.75–5.0 g/ha) for 6 months. Fly populations were monitored fortnightly with 16 sticky traps (245×200 mm) set for 24 h per cluster. Traps were set on the day before spraying to reflect the minimum level of fly control achieved.

The UBT was repeated in cohort children at a survey at the end of the intervention. Information on antibiotic prescriptions from local health centres (mainly penicillin and co-trimoxazole) was collected from the children’s Road to Health cards, and carers were asked about feeding practices and the use of traditional medicines. UBTs were also performed in infants aged 6–11 months at the follow up survey. Based on previous research, about 80% of these infants are likely to have been uninfected at the beginning of the intervention. The study was approved by the Joint Gambia Government/Medical Research Council Ethics Committee.
We thank the families in The Gambia for participating in the study, Momodou Sanneh and members of the “Flies and Eyes” team for excellent fieldwork, and a number of medical elective students for help with collecting data.

Authors’ affiliations
S J Allen, R Bailey, P M Emerson, Medical Research Council Laboratories, PO Box 273, Banjul, The Gambia

J E Thomas, Sir James Spence Institute of Child Health, Royal Victoria Infirmary, Newcastle-upon-Tyne, UK
N D E Alexander, Infectious Disease Epidemiology Unit, London School of Hygiene and Tropical Medicine, London, UK

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Correspondence to: Dr S J Allen, The Clinical School, University of Wales Swansea, Swansea SA2 8PP, Wales, UK; s.j.allen@swansea.ac.uk

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REFERENCES
1 Mitchell H, Mégraud F. Epidemiology and diagnosis of Helicobacter pylori infection. Helicobacter 2002;7(suppl 1):8–16.

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Table 1 Characteristics of children and effects of intervention

<table>
<thead>
<tr>
<th></th>
<th>Insecticide villages</th>
<th>Control villages</th>
<th>p Value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline survey</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Number (% positive UBTs†)</td>
<td>52/82 (63.4)</td>
<td>74/124 (59.7)</td>
<td>0.69</td>
</tr>
<tr>
<td>Median (IQR) age, months</td>
<td>12.5 (8.9–15.4)</td>
<td>11.5 (8.2–15.0)</td>
<td>0.40</td>
</tr>
<tr>
<td>Follow up survey: cohort children Number (% positive UBTs†)</td>
<td>41/54 (75.9%)</td>
<td>63/79 (79.8)</td>
<td>0.76</td>
</tr>
<tr>
<td>Follow up survey: infants aged 6–11 months Number (% positive UBTs†)</td>
<td>31/42 (73.8)</td>
<td>19/29 (65.5)</td>
<td>0.63</td>
</tr>
<tr>
<td>Median (IQR) age, months</td>
<td>8.5 (7.0–10.7)</td>
<td>9.5 (7.1–10.7)</td>
<td>0.76</td>
</tr>
<tr>
<td>Catches of M. domestica</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of fly traps</td>
<td>1176</td>
<td>1162</td>
<td>–</td>
</tr>
<tr>
<td>Median (IQR) M. domestica per trap</td>
<td>1 (0–5)</td>
<td>4 (1–12)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Range</td>
<td>0–151</td>
<td>0–619</td>
<td>–</td>
</tr>
<tr>
<td>Number of traps with no M. domestica after 24 h</td>
<td>499</td>
<td>266</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

IQR, interquartile range; UBT, urea breath test.
†χ² test for categorical variables and Mann-Whitney U test for continuous variables.
Children with inadequate breath samples have been excluded: a total of four from the insecticide and three from the control villages.

Figure 1 Change in H. pylori status according to village group. Error bars show 95% confidence interval for a proportion. †UBT negative at baseline and positive at follow up; ‡UBT positive at baseline and negative at follow up.

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We thank the families in The Gambia for participating in the study, Momodou Sanneh and members of the “Flies and Eyes” team for excellent fieldwork, and a number of medical elective students for help with collecting data.

No. of children | Cohort children who acquired infection* | Cohort children who lost infection† |
---|---|---|
31 | 21 | 48 | 33
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