Predictors of recurrent abdominal pain among 9 to 15-year-old urban school-children in Malaysia

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A cross-sectional survey of school-children aged from 9 to 15 y was performed in the city of Petaling Jaya to look for predictors of recurrent abdominal pain. A sample of 1488 children was randomly chosen, of whom 143 (9.6%) had recurrent abdominal pain according to Apley’s criteria.

Conclusion: The results of the study show that recurrent abdominal pain was associated with a number of demographic variables, a tendency to have other complaints and a family history of chronic abdominal complaints.

Keywords: Malaysian urban school-children, recurrent abdominal pain

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The problem of recurrent abdominal pain in children has challenged the medical profession for many years. In the late 1950s, John Apley’s large field survey of 1000 school-children in England became a milestone in the study of this condition and an important reference for subsequent investigators (1). He defined recurrent abdominal pain as “at least three episodes of abdominal pain, severe enough to affect their activities, over a period longer than three months” (1).

Today, the underlying cause and pathophysiology is still unclear. In 90–95% of cases with recurrent abdominal pain, no organic cause can be identified and the children are often considered to have a functional disorder of the gastrointestinal tract (2–5). The purpose of this study was to examine some of the correlates of recurrent abdominal pain among urban school-children in a Malaysian city.

The study was approved by the ethics committee of the University of Malaya Medical Centre.

A cross-sectional survey was done on school-children aged from 9 to 15 y in the city of Petaling Jaya, which covers an area of 484 square kilometres. The city has a population of 633 165, with a population density of 1308 per square kilometre and an average annual population growth rate of 5.1%. There are 28 secondary schools and 78 primary schools. Six schools were selected at random from a list of all schools in the city. In each school, children in the above age group were randomly selected for inclusion in the study. One-thousand-four-hundred-and-eighty-eight children were sampled, none of whom were excluded from the study. A letter was sent to each parent asking for permission for their child to take part in the study. None of the children or parents refused participation in the study.

Data were obtained by means of a questionnaire filled in by each child, followed by one-to-one interview of the child by one investigator (CCMBoey). Recurrent abdominal pain was present if there was non-menstrual abdominal pain occurring at least three times over a period of at least 3 mo, interfering with normal daily activity, which was defined as missing school and/or having to stop doing a routine daily activity because of pain. As the questionnaire forms were given out and collected on the same day, we were able to ensure that we got back all the forms. Data were predominantly derived from the questionnaire responses and interview with the individual child. The presence of risk factors was confirmed by a separate questionnaire filled in by the parents. Using the questionnaires, data were also obtained regarding demographic features, such as age, sex, ethnic group, father’s educational attainment and occupation, and total family income; the presence of other symptoms; and the presence of gastrointestinal symptoms in parents and siblings.

Bivariate analysis was performed to obtain estimates of significance using Pearson chi-squared tests (significant if \( p < 0.05 \)) and to obtain crude odds’ ratios for each variable. Where appropriate, multivariable analysis was performed using the technique of multiple logistic regression analysis. Precision was estimated by calculating the 95% confidence interval (CI).

Of the 1488 children sampled, 143 (9.6%) had recurrent abdominal pain. Sixty-two out of 541 (11.5%) children between 9 and 11 y of age, and 81 out of 945 (8.6%) between 12 and 15 y, had recurrent abdominal pain, but the difference is not significant \( (p = 0.07) \). As this was a school survey of children, we were unable to obtain data on birthweight and the
presence of prematurity, but none of the children had a history of chronic illness, handicap or recurrent infectious disease.

Girls (11.0%) had a higher prevalence of recurrent abdominal pain than boys (8.3%), but the difference is not significant \((p = 0.082)\). Malays (11.4%) appeared to have a higher prevalence than Chinese (8.8%), with Indians having the lowest prevalence (6.7%). However, chi-squared tests reveal that none of the ethnic groups had a significant risk for recurrent abdominal pain. In the same way, neither age \((p = 0.069)\) nor being an only child \((p = 0.154)\) was a significant risk. On the other hand, children whose fathers had non-professional or non-administrative occupations had a higher prevalence of recurrent abdominal pain than those whose fathers had such occupations (12.0% vs 7.2%; \(p = 0.002\); Odd’s ratio 0.57, 95% CI 0.40–0.81). Those whose fathers had a lower educational attainment (12.7% vs 5.9%; \(p < 0.001\); odds’ ratio 2.31, 95% CI 1.51–3.53), and whose monthly family income was below RM 2000 (13.3% vs 7.5%; \(p = 0.001\); odds’ ratio 1.88, 95% CI 1.27–2.80; one United States dollar is equivalent to RM 3.7), were also at increased risk of having recurrent abdominal pain. Multiple logistic regression analysis of recurrent abdominal pain on demographic variables reveals that only a low educational attainment of form 5 and below \((p = 0.034); \text{odds’ ratio 0.55, 95\% CI 0.32–0.96}) is significantly associated with recurrent abdominal pain.

Compared to children without recurrent abdominal pain, those with this problem were more likely also to complain of at least one other systemic symptom \((p < 0.001); \text{odds’ ratio 5.96, 95\% CI 3.63–9.78})

Children with recurrent abdominal pain had a significant tendency to complain of headaches, nausea, limb pains, lethargy and constipation (Table 1).

Multiple logistic regression analysis of recurrent abdominal pain on systemic complaints shows that the presence of at least one systemic complaint \((p = 0.002); \text{odds’ ratio 0.37, 95\% CI 0.19–0.70})

Table 1. The prevalence of recurrent abdominal pain (RAP) among school-children in Petaling Jaya according to the presence of complaints of other symptoms.

<table>
<thead>
<tr>
<th>Specific complaints</th>
<th>No RAP (%)</th>
<th>RAP (%)</th>
<th>(p)-value</th>
<th>Odds’ ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headaches No Yes</td>
<td>918/978 (93.9) 60/978 (6.1) &lt;0.001 5.82 (2.51–12.50)</td>
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<tr>
<td>Nausea No Yes 1139/1244 (91.6) 105/1244 (8.4) &lt;0.001 3.02 (2.01–4.57)</td>
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<tr>
<td>Limb pains No Yes 1080/1184 (91.2) 104/1184 (8.8) &lt;0.001 2.08 (1.39–3.09)</td>
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<tr>
<td>Lethargy No Yes 910/977 (93.1) 67/977 (6.9) &lt;0.001 2.83 (1.99–4.01)</td>
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<tr>
<td>Constipation No Yes 1230/1357 (90.6) 127/1357 (9.4) &lt;0.001 3.44 (1.89–6.27)</td>
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</tbody>
</table>

Among the 143 children with recurrent abdominal pain, four (2.8%) gave a history of having passed out worms rectally, whereas out of 1275 children with no recurrent abdominal pain, 38 (3.0%) give such a history. The difference was not statistically significant \((p = 0.902)\).

Children with parents who had chronic complaints of abdominal pain \((p < 0.001); \text{odds’ ratio 3.48, 95\% CI 2.22–5.46})

and those with siblings who had recurrent abdominal pain \((p < 0.001); \text{odds’ ratio 4.22, 95\% CI 2.46–7.21})

both had increased risk for recurrent abdominal pain.

In recent years, there has not been much up-to-date epidemiological data, especially in South-East Asia, on recurrent abdominal pain and its correlates. In a survey of an older group of urban and rural Malaysian children (11 to 16-y-olds), a prevalence of recurrent abdominal pain of 10.2% was found (6). In another preliminary pilot study of a single rural Malay school, a significant association was found between recurrent abdominal pain and the presence of stressful events, as well as with the presence of other systemic complaints (7). In the present study, family factors were found to be significantly associated with recurrent abdominal pain. Children whose fathers had a lower educational background or held non-professional jobs, and those who came from families with lower monthly income, were all found to have a higher risk for recurrent abdominal pain. Abdominal complaints in parents and siblings were also more likely to be found in those children with recurrent abdominal pain.
It is interesting to note that children with recurrent abdominal pain also tended to be those who also had other complaints. This study demonstrated significant correlation between recurrent abdominal pain and the presence of at least one other complaint. In particular, there was association with headache, nausea and constipation. The multisymptomatology is likely to be related to the presence of stress. Kurtz found that migrainous headache, abdominal pain and vomiting were associated with emotional disorder (8), while Davison discovered that symptoms may be an outcome of interaction between difficult temperament and environmental stresses (9). A recent study of adolescents from the United States of America showed that abdominal pain severe enough to affect activities occurred in approximately 21% of subjects (10). Anxiety and depression scores were significantly higher for subjects with irritable bowel syndrome-type symptoms compared with those without symptoms.

In conclusion, this study provides data not previously available in South-East Asia showing that recurrent abdominal pain is associated with a number of demographic variables, a tendency to have other complaints and a family history of chronic abdominal complaints. Clinically, this finding is important, providing evidence in support of the need to take a thorough family and social history when dealing with children who have recurrent abdominal pain. It would be useful to conduct further studies to look at whether the associations found in this study are different in other groups of children, such as those from rural schools as well as those who are younger.

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References


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