

Original Article

Experience of ^{13}C -Urea Breath Test in Eight Children

CKL Kwok, DKK Ng

Abstract

Urea breath test (^{13}C -UBT) is a non-invasive diagnostic test for *Helicobacter pylori* infection. A preliminary retrospective study was conducted in the use of ^{13}C -UBT in paediatric patients in Hong Kong. The study was conducted in Kwong Wah Hospital, a regional public hospital in urban Hong Kong. Eight asymptomatic paediatric patients who underwent ^{13}C -UBT were analyzed retrospectively. Positive ^{13}C -UBT was found in two (25%) of these eight paediatric patients. There was positive paternal history of dyspepsia in both patients.

Key words

Breath test; Children; Chinese; *Helicobacter pylori*; Urea

Introduction

Helicobacter pylori (*H. pylori*) infection is a common infection. It was estimated that half of the world's population is being infected with the organism. Cross-sectional studies showed that the bacterium is usually acquired before the age of 5-year.¹⁻³ Infection of *H. pylori* mainly occurs among children living in developing countries and in children living in poor socioeconomic circumstances in developed countries.⁴⁻⁷ The urea breath test (^{13}C -UBT) is a reliable diagnostic test.^{8,9} The main problem lies with its costly instrument for analysis of the breath. There is also a need to evaluate the test further in young children, especially in those less than 2 years of age in whom false-positive rate of ^{13}C -UBT was demonstrated to be higher.¹⁰ Its use in Hong Kong has been limited because of the cost as well as the consensus that there is no indication for widespread screening for *H. pylori* infection in symptomatic or asymptomatic children.⁸ We report here the preliminary study results of ^{13}C -UBT in Hong Kong Chinese children.

Methods

Retrospective review of the records of all paediatric patients that underwent ^{13}C -UBT in Kwong Wah Hospital was conducted. ^{13}C -UBT was undertaken in the following manner. Patients were kept fast for a minimum of 4 hours before the test. A citric acid test meal was used to delay gastric emptying. Patients' exhaled air was collected before and 30 minutes after the ingestion of a 75 mg ^{13}C urea tablet. A delta value of greater than five as measured by the mass spectrophotometer (ABCA; Europa Scientific, Crewe, UK) was taken as a positive result. The UBT protocol and the cut off delta value of 5 are adopted from adult data. They have not been validated in children locally. Subjects were recruited on the following criteria: 1) older than 5-year and 2) evidence of infection that warranted treatment with antibiotics. They were excluded if there was past history of antibiotic treatment in the preceding four weeks before ^{13}C -UBT as recent antibiotic treatment would cause a decrease in *H. pylori* density resulting in false negative results. The test was performed within 24 hours of admission. Written consent was obtained from one of the parents.

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Results

The baseline demographic data was shown in Table 1. Two girls and six boys were recruited. The mean age was

Table 1 Demographic data for the eight paediatric patients that have undergone ¹³C-UBT.

Sex	Age (years)	¹³ C-UBT result	Family history of possible gastritis or ulcer problems
Girl	6	-ve	-ve
Boy	11	+ve	+ve (father)
Girl	6	-ve	-ve
Boy	8	-ve	+ve (mother)
Boy	7	-ve	-ve
Boy	11	-ve	-ve
Boy	8	-ve	-ve
Boy	5	+ve	+ve (father)

7.75±2.25 years old (range 5-11-year). The urea breath test was carried out smoothly in all these eight patients and no discomfort was experienced during the test. ¹³C-UBT was positive in two out of eight patients (25%). Both of the two positive tests occurred in boys and they were both asymptomatic. Both declined further investigations. The father of each of them had a history of dyspepsia with no diagnostic tests done. Their mothers did not have any history of gastrointestinal problem. None of the subjects had history of dyspepsia and only one subject had history of recurrent abdominal pain and his breath test was negative.

Discussion

The prevalence of *H. pylori* infection in asymptomatic Chinese children varies from 28.7% to 73.11%^{11,12} while the prevalence of *H. pylori* infection in Europe and North America was lower, varied from 6% to 32%.¹³⁻¹⁶ This may be related to the difference in the social environment. If this hypothesis was correct, a lower prevalence of *H. pylori* infection should be observed in asymptomatic Chinese children in Hong Kong where the social environment was more similar to that of the developed Western countries. This assumption was supported by the current small preliminary study which showed the prevalence to be 25% and previous study from this department which showed prevalence to be 22% in children with dyspepsia.¹⁷ It was interesting to note that all the positive breath tests in our study occurred in boys because gender has not been shown to be a risk factor for *H. pylori* infection. This might be due to the small sample size in this cohort. We had one patient with recurrent abdominal pain that failed to demonstrate a positive breath test. It is not surprising because it was well reported that the prevalence of *H. pylori* in Chinese children with recurrent abdominal pain was low, only 17.5%.¹⁸

The main limitation of the current study was the small number of patients enrolled and a population-based study would be required for assessment of prevalence in the general community.

Conclusion

This small preliminary study summarised the performance of ¹³C-urea breath test in our patients. A population-based study would be required for assessment of the prevalence of *H. pylori* in children in Hong Kong.

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