A Retrospective Study of Nosocomial Infections in a Pediatric Hospital: A Seven-Year Experience at Beijing Children’s Hospital

Nosocomial infections (NIs) cause significant morbidity and mortality among hospitalized children and have a considerable impact on healthcare costs and prolonged hospital stays in pediatric patients. Multiple factors contribute towards exposing children to the risk of infection when hospitalized, and NIs in pediatric patients differs from those in adults. Data from China regarding NIs in children are scarce. We conducted a retrospective study of children who were admitted to the Beijing Children’s Hospital between 2000 and 2006. The aim of this study was to investigate the rate of NIs and the frequency of nosocomial pathogen in a general children’s hospital over a seven-year period. Computerized records on NI were established in 2000 at Beijing Children’s Hospital, and the records were reviewed and analyzed in this study. NI was defined as an infection acquired in the hospital that was diagnosed during hospitalization, provided there was no evidence that the infection was undiagnosed or sub-clinical at the time of admission. Infections located in more than one site in the same patient were counted as separate infections. Infection was considered to be nosocomial if it was diagnosed 72 h or more after admission. Those infections that became evident after hospital discharge were not included. NI rates were calculated on the basis of cases identified through active surveillance and the number of patients hospitalized annually. During the study period, 163 508 patients were discharged from this general children’s hospital and there were 5994 NI episodes identified. The mean annual rate of NIs was 3.67% episodes per 100 discharges. There was a significant difference in annual NI rates between 2000 and 2006 (p < 0.01). NI rates ranged between 0.2 and 12.6% in different department, and the highest rates were observed in the hematology department, followed by the internal medicine department, the pediatric intensive care unit and the neonatal intensive care unit. Regardless of the year of surveillance, the most commonly detected NIs involved the upper respiratory tract, which accounted for more than 50% of all NIs, followed by the lower respiratory tract and gastrointestinal tract. These findings differed from other reports in adults. Gram-negative bacteria were the most common causative pathogen, in which *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, *Escherichia coli* and *Acinetobacter baumannii* accounted for more than 65% of all isolated Gram-positive bacteria. *Enterococcus* spp., *Staphylococcus* spp. and *S. aureus* were the most frequently isolated Gram-positive bacteria. Rotavirus and *Candida* spp. were the most frequently isolated viral and fungal organisms, respectively. In conclusion, the present study provides useful information regarding NIs in Chinese pediatric patients. For future studies, the prospective use of incidence density rates and post-discharge surveillance in pediatric patient populations would be more valuable and efficient.
AIHUA WANG\textsuperscript{a,b}, SHAOZHEN FAN\textsuperscript{a}, and XUZHUANG SHEN\textsuperscript{a}

\textsuperscript{a}Beijing Children’s Hospital, Capital Medical University, Beijing, and \textsuperscript{b}The second hospital of Lanzhou University, Lanzhou, China
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Correspondence: Xuzhuang Shen, Beijing Children’s Hospital, Capital Medical University, 56 South Lishi Road, Beijing 100045 P. R. China.
E-mail: <xuzhuangshen@163.com>

Serum Total Homocysteine Concentrations in Children and Adolescents in Jos, Nigeria

Summary

Background: Although the elevation of circulating total serum homocysteine (tHcy) concentration in a fasting state is associated with an increased risk of occlusive vascular disease in adults, the levels in children in Nigeria are not known.

Aim: The goals of this study were to describe the distribution of tHcy among a representative sample of children and adolescents in Jos, Nigeria, and to test for differences in tHcy among sex and age categories.

Methods: The sampling scheme, which included persons aged 10 to 19 years, was a stratified, multistage probability design. This cross sectional study involved 182 school children drawn from secondary schools in Jos, Nigeria between January and July 2003. Fasting venous samples were collected and assayed for tHcy, Total protein and Albumin. Anthropometric measurements were taken.

Result: The mean tHcy concentrations were $2.7 \pm 2.4$ (95% CI 2.4–2.9), $3.5 \pm 3.2$ (3.3–3.8) and $3.6 \pm 3.2$ (3.3–4.1), $4.1 \pm 3.6$ (4.0–4.4) mol/l for the girls and boys aged 10–14 and 15–19 years, respectively. Albumin levels correlate positively with plasma total homocysteine, tHcy ($r = 0.45$, $P = 0.03$).

Conclusion: This study provided age-specific data regarding tHcy concentrations between 10–19 years population in Jos, Nigeria. The tHcy concentration increased as a function of age in both sexes.

Key words: children, adolescent, albumin, homocysteine, age-specific.

Background

Reference data for homocysteine (Hcy) levels in the paediatric age group based on representative samples are lacking in Nigeria unlike those for adults [1]. Therefore, this study is aimed at determining a reference range for the defined age group and to find out, if any, difference in total serum homocysteine (tHcy) levels between sexes at this age range.

Subjects and Methods

Subjects were secondary school pupils within the Jos town of the Plateau state of Nigeria. They were 182 in number and selected through a stratified, multistage probability design and aged 10–19 years. Consent was obtained from the parents and the research and ethical committee of the Jos University Teaching Hospital, Jos.

Result

The results obtained after analyses are as shown in the tables below.

Discussion

The results show that tHcy concentrations increased with age and higher in boys than girls within the same age range (Table 1, Fig. 1). The increase in tHcy with age is observed throughout the age range and more so in the 19\textsuperscript{+}–23 years age group school children in Jos, Nigeria. This finding is in agreement with those of Must, \textit{et al}. where children aged 4–19 years were studied [2]. Beynum, \textit{et al}. also established from 234 white Dutch children between 0–19 years that tHcy increased with age [3]. This finding was also observed in the study of tHcy in children in Taiwan [4]. Going through the report of Reddy while establishing reference ranges for children in 1996, one can also see that there is an increase in tHcy with age [5]. Not only were there increases in mean tHcy but these investigators also observed a higher level in males than females in all the age groups studied [2–4, 6]. Atabek, \textit{et al}. [6] found the mean plasma level of Hcy to be $5.6 \pm 2.9$ mol/l among controls aged 6–19 years in a study in Turkey and the result of this study ($3.3 \pm 3.0$ mol/l) is a favourable one comparatively (Fig. 2).

\textbf{Table 1}

<table>
<thead>
<tr>
<th>Sex</th>
<th>Age (years)</th>
<th>Numbers(n)</th>
<th>Mean(mol/l)</th>
<th>2SD</th>
<th>SEM</th>
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<tr>
<td>Male</td>
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<td>5.8</td>
<td>3.6</td>
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</tr>
<tr>
<td>Female</td>
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<td>28</td>
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<td>2.4</td>
<td>0.45</td>
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<tr>
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<td>3.5</td>
<td>3.2</td>
<td>0.41</td>
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<tr>
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<td>5.1</td>
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