Spectrum of infections in children with nephrotic syndrome

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Background: Infection remains an important complication in children with nephrotic syndrome. Besides being the commonest cause of mortality, infections result in significant morbidity and may also be responsible for a poor response to steroid therapy or induce relapse in a child who has already attained remission. The study was undertaken to observe the type of infection in children with nephrotic syndrome and to study the relation of infection to relapse.

Methods: A prospective study was done in children diagnosed to have nephrotic syndrome (satisfying ISKDC Criteria) and treated in the Department of Paediatrics, Kastuba Hospital, Manipal, India from August 2005- July 2007. Children with steroid resistant nephrotic syndrome were excluded from this study. Those who satisfied the inclusion criteria were monitored for infectious complications. Relevant investigations were carried out during the episode of infection. Data was analyzed using SPSS 11 data editor and the Z test for proportions.

Relapses (n=101)

<table>
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<tr>
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<th>Off steroid therapy (n=66)</th>
<th>On steroid therapy (n=35)</th>
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<tbody>
<tr>
<td></td>
<td>Only antibiotics</td>
<td>Start steroid± antibiotics</td>
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<td>n %</td>
<td>n %</td>
<td>n %</td>
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<tr>
<td>With Infection (n=78)</td>
<td>8 10.2</td>
<td>45 57.6</td>
</tr>
<tr>
<td>With Infection (n=23)</td>
<td>— —</td>
<td>13 56.5</td>
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Treatment of relapses of Nephrotic Syndrome

Results: There were 101 episodes of relapse in 73 children with steroid sensitive nephrotic syndrome. Of these episodes, relapse was precipitated by an infection in 77.2% (n=78) of cases. Hence it was found that infections were associated with increased risk of relapses (p<0.005) which was statistically significant. Upper respiratory tract infection (50.4%) was the commonest infection followed by lower respiratory tract infection (22.3%), UTI (10.7%), acute gastroenteritis (9%), skin infections(4.1%), tuberculosis and peritonitis in 1.65% respectively. In children who were off steroid therapy, prompt control of infection with antibiotics induced remission in 8 episodes of relapse. In 45 episodes, children were started on steroids in addition to the use of antibiotics. Remission induction did not warrant modification of steroid dose as the infection was promptly controlled with appropriate antibiotic therapy during 17episodes. Majority of the episodes of relapse occurred while children were off steroids (66/101) whereas 35 out of 101 episodes of relapses occurred while children were on steroid treatment.

Conclusion: Children with nephrotic syndrome are vulnerable for recurrent infections, which play a significant role in relapse. Prompt control of infection plays a crucial role in inducing remission in children with steroid sensitive nephrotic syndrome.

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Multicenter study of meningococcal disease in children in pediatric hospitals in Argentina

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Background: Neisseria meningitidis infections are an important cause of morbidity and mortality in children of all ages. Latinoamerican studies of this infection are scarce.

Methods: Retrospective reviews of medical and microbiologic records from Hospital de Niños Juan P Garrahan (HJPG) and Hospital de Niños Ricardo Gutierrez (HNRG), both in Buenos Aires, Argentina were done to identify patients with invasive N. meningitidis infections between 1998 and 2008. Demographic and clinical data were reviewed. OBJECTIVES. To analyse the epidemiology, clinical features and outcome of invasive infections caused by N. meningitidis.

Results: One hundred and twenty-six cases (HJPG: 77; HNRG: 49) of invasive meningococcal infection were analyzed during the study period. The median age at presentation was 33 months (range, 1 to 180). Fifty-two percent had male and 15% had underlying disease. Eleven percent had previous antibiotic treatment. The median time of symptoms previously to admission was 1.5 days. The most common signs and symptoms at admission included fever (96%) (> 39 C: 40%; median duration: 3.5 days), rash (61%), nuchal rigidity (37%), vomiting (51%), irritability (59%) and lethargy (64%). The final diagnosis were: meningitis (86%), meningococcemia without meningitis (10%), septic arthritis (10%) and occult bacteremia (1.5%). Twenty-four children (19%) required ICU hospitalization. The median time of ICU admission was 5 days (range: 1-45). Four patients died (3.1%) (serotype C: 2 and without typification (WT): 2). Long term sequelae were seen in 15 patients (12%) (serogroup B: 6,
The association between vitamin D deficiency, folate deficiency and seropositivity to persistent pathogens among U.S. children

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Background: Studies have documented the association between vitamin deficiency and immune system dysfunction. Few studies have examined the relationship between vitamin deficiencies and infection with specific pathogens. The purpose of this study was to investigate whether vitamin D and/or folate deficiency (levels < 20 ng/ml and < 362.6 nmol/L, respectively) are associated with seropositivity to persistent pathogens including cytomegalovirus (CMV), herpes simplex virus-1 (HSV-1) and helicobacter pylori (H. pylori) as well as with total pathogen burden (total number of the above pathogens for which a subject is seropositive, range 0-3).

Methods: We used data from the National Health and Nutrition Examination Survey III, including subjects 12-19 years of age who were tested for seropositivity to each pathogen and serum levels of vitamin D or folate (N=1275). Logistic regression was conducted to generate the odds ratio (OR) and 95 percent confidence intervals (CI) for seropositivity to each pathogen and serum levels of vitamin D or folate. Multivariable adjusted logistic regression was used to generate the OR and 95% CI for seropositivity to an additional pathogen (i.e., increasing total pathogen burden).

Results: In crude models, vitamin D deficiency was associated with CMV seropositivity (OR 2.09, 95% CI (1.60, 2.74)), HSV-1 (OR 1.53, 95% CI (1.14, 2.05)) and seropositivity to an additional pathogen (OR 1.64, 95% CI (1.10, 2.44)). Only the association between vitamin D deficiency and CMV remained after controlling for gender, race/ethnicity and poverty income ratio (OR 1.38, 95% CI (1.01, 1.89)). Folate deficiency was associated with seropositivity to HSV-1 (OR 1.32, 95% CI (1.04, 1.68)) in the crude model, however this association was no longer significant after controlling for confounders.

Conclusion: Vitamin D deficiency was associated with CMV seropositivity in this U.S. representative sample of children age 12-19. Vitamin supplementation could serve to lower the prevalence of CMV infection in children in the U.S.

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Pilot study to determine feasibility of development of an influenza clinical diagnostic tool

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Background: Influenza is a costly healthcare burden worldwide. Diagnosing influenza in a timely and accurate manner allows the proper appropriation of scarce healthcare resources and antiviral medications. Unfortunately, current testing technologies are either insensitive (rapid antigen tests), nonspecific (clinical diagnosis) or untimely and expensive (rt-PCR). Ultimately, treatment and management decisions for influenza are suboptimal due to lack of diagnostic accuracy. The need for differentiating influenza from other viral infections led us to the hypothesis that influenza may have a large affect on certain vital signs allowing development of a clinical diagnostic tool.

Methods: We prospectively collected data, including demographics, vital signs and rapid influenza antigen testing results from patients who presented to primary care clinics with fever and a cough or fever and a sore throat (influenza like illness) of 2 days or less duration. A total of 38 children were included in this analysis. Subjects’ heart rates were converted to a uniform unit (heart rate ratio) by dividing their heart rate by the median heart rate for age. Likelihood ratios (LR) were determined for apparently significant vital sign thresholds.

Results: 14 children were influenza A positive by rapid antigen testing. Compared to rapid antigen negative controls, clinically significant likelihood ratios were determined for heart rate ratio greater than 1.4 (Positive LR = 10 (CI 1.4-76.9)) and a combination of current temperature less than 38C with a heart rate ratio less than 1.25 (Negative LR = 0.24 (CI 0.06-0.99)). Other vital signs yielded no predictive significance.

Graphs of Likelihood Ratios

Conclusion: Although limited by its small size and the use of the rapid antigen test as a proxy to a gold stan-