A prospective cohort study in 3 pediatric emergency departments.

Patients: A convenience sample of 100 febrile children aged 2 years or younger with either laboratory-documented bacterial infections (n = 31; 24 with urinary tract infections, 7 with bacteremia) or laboratory-documented respiratory viral infections (n = 69). Each patient received a clinical appearance score using the Yale Observation Scale prior to laboratory evaluation. A complete blood cell count was obtained from all patients and manual differential count of the peripheral blood smear was performed by 1 senior technician masked to clinical information.

Main Outcome Measure: Band counts, represented as a percentage of white blood cells in the peripheral blood smear, the absolute band count, and band-neutrophil ratio. Logistic regression analysis was performed to determine whether the band count helps to distinguish bacterial infections from viral infections after adjusting for age, temperature, Yale Observation Scale score, and absolute neutrophil count.

Results: Patients with bacterial infections had a higher mean absolute neutrophil count (11.3 vs 5.9 × 10^9/L; P < .01) than patients with respiratory viral infections. There was no difference, however, in percentage band count (13.5% vs 13.3%; P = .90), absolute band count (2.2 vs 1.9 × 10^9/L; P = .31), or band-neutrophil ratio (0.24 vs 0.33; P = .08, bacterial vs viral, respectively); the band count did not help to distinguish bacterial and viral infections after adjusting for age, temperature, Yale Observation Scale score, and absolute neutrophil count in the regression analysis.

Conclusion: The band count in the peripheral blood smear does not routinely help to distinguish bacterial infections from respiratory viral infections in young febrile children.

PATIENTS AND METHODS

PATIENT POPULATION

The data were derived from a cohort of young febrile children enrolled in a study of unsuspected bacterial infections.35 In that study, we prospectively enrolled a convenience sample of febrile children younger than 2 years seen in the emergency departments of 3 pediatric referral hospitals between November 1994 and April 1995, and between November 1995 and February 1996. Patients were included in the study if they had fevers determined rectally in the emergency department, or at home within 4 hours of presentation, of temperature of 38°C or higher for patients younger than 3 months and temperature of 39°C or higher for patients 3 to 24 months old. Patients were excluded from the study if they (1) were immunized or had received antibiotics within 48 hours of presentation to the emergency department, (2) had a clearly identifiable infection apparent on physical examination (ie, varicella, croup, gingivostomatitis, cellulitis, or septic arthritis), (3) had a chronic illness or known immunodeficiency, (4) were currently taking immunosuppressive medication, or (5) if a parent or legal guardian was unable to refuse or to give written informed consent. The study was approved by the institutional review boards of each participating institution.

Patients with clearly evident viral syndromes known to be associated with high fevers (ie, croup, gingivostomatitis, and varicella) were excluded because ethical considerations precluded obtaining laboratory tests on these patients. Patients with less specific signs of viral illness (ie, diarrhea or wheezing), however, were included. Otitis media was not considered an exclusion criterion because febrile infants with and without otitis media have a similar risk of bacteremia.23,36

as opposed to the determination of the total neutrophil count, which only requires the use of an automated cell counter. It would therefore be important to ascertain whether band counts differ between young febrile children with documented viral and bacterial infections. If differences in the band count between children with these infections did exist, it would also be important to determine whether the band count adds additional information for distinguishing bacterial and viral infections after adjusting for clinical information, as well as information available from an automated CBC (ie, ANC).

The objectives of this study were (1) to determine whether the percentage band count, the absolute band count (ABC), or the band-neutrophil ratio (BNR) in the peripheral blood smear differs between young febrile children with documented bacterial or respiratory viral infections, and (2) to determine whether the band count helps to distinguish young febrile children with bacterial infections from those with respiratory viral infections after adjusting for readily available clinical information (age, temperature, clinical appearance) and hematologic information available from an automated CBC (ie, ANC).

CLINICAL AND LABORATORY EVALUATION

An attending physician obtained a history and performed a physical examination on each patient. Prior to laboratory investigation, a study investigator evaluated the general appearance of each patient using the Yale Observation Scale (YOS), with a score of 10 or less representing well appearance.37,38 A CBC, manual differential count, and blood culture were then obtained from all patients. Total WBC was determined using an electronic cell counter, and 100 cells of the Wright-stained peripheral blood smear were evaluated by 1 senior technician unaware of clinical and laboratory information. Catheterized urine cultures were obtained from girls of all ages and from boys younger than 6 months, according to the guidelines by Baraff et al.1 Lumbar punctures were performed on patients younger than 2 months and on any other patient for whom it was believed to be clinically indicated by the responsible physician. Nasopharyngeal specimens were obtained for detection of RSV, adenovirus, influenza, and parainfluenza viruses by immunofluorescence from all patients whose guardians consented to this procedure (parents were also given the option to participate in the original study without having nasopharyngeal specimens obtained). Specimens were obtained by scrapings of the nasopharynx using a plastic spoon-tipped curette (Rhino-probe; Arlington Scientific, Inc, Arlington, Tex). The results of these tests were not immediately available to the physician caring for the patient. In cases where the responsible physician required immediate results of the nasopharyngeal specimen analysis for diagnostic or therapeutic purposes, an enzyme-linked immunosorbent assay was performed. These results were also included in the data analysis.

Chest radiographs were obtained for patients with signs of lower respiratory tract illness (wheezes, rales, crackles), and all radiographs were interpreted by a single pediatric radiologist masked to patient and laboratory information. Patients with lobar infiltrates were excluded from the present

STUDY POPULATION

A total of 432 patients were prospectively evaluated and enrolled in the study. Nasopharyngeal specimens were obtained for viral analysis from 226 patients (52%), 75 of whom had documented respiratory viral infections (64 with RSV, 6 with parainfluenza, 3 with influenza, and 2 with adenovirus infections; 57 of these patients had clinical bronchiolitis). Of the 432 enrolled patients, 31 had documented bacterial infections (24 with UTI, 7 with bacteremia) (Table 1). No patient had bacterial meningitis.

Chest radiographs revealed lobar pneumonias in 15 of the 432 patients, who were subsequently excluded from analysis. One RSV-positive patient had a UTI and was also excluded from the analysis. The remaining 69 patients with laboratory-documented viral infections were compared with the 31 patients with documented bacterial infections (Table 1). Fourteen (45%) of the 31 patients with bacterial infections and 28 (41%) of the 69 patients with viral infections were girls ($P = .67$). Of the 100 patients with laboratory-documented infections, 14 were Afri-
analysis owing to the inability to distinguish viral from bacterial etiology. Patients with documented simultaneous viral and bacterial infections were also excluded.

DEFINITIONS AND OUTCOME VARIABLES

Respiratory viral infection was defined as the detection of any of the previously mentioned respiratory viruses on either immunofluorescence or enzyme-linked immunosorbent assay. A bacterial infection was defined as growth of a known bacterial pathogen from the blood (bacteremia) or pure growth of at least 10^5 colony-forming units per milliliter of a bacterial pathogen from a catheterized or suprapubic specimen of urine. Hematogenous isolates considered pathogens included Haemophilus influenzae type b, Streptococcus pneumoniae, Neisseria meningitidis, Salmonella species, Streptococcus pyogenes, Streptococcus agalactiae (group B streptococcus), Moraxella catarhalis, Escherichia coli, or Staphylococcus aureus.

STATISTICAL ANALYSIS

Univariable Analysis

We compared patients with respiratory viral infections with those with bacterial infections with regard to age, temperature, YOS score, WBC, ANC, ABC, percentage band count, and BNR. The ANC was calculated by multiplying the total WBC by the sum of the percentage mature neutrophils and percentage band forms seen on the peripheral blood smear. The ABC was calculated by multiplying the total WBC by the percentage band forms; the BNR was calculated by dividing the percentage band count by the percentage total neutrophil count. Continuous variables were compared between patients with viral and bacterial infections using the Student t test, except in subanalyses in which there were fewer than 20 patients in each group, in which continuous variables were compared using the Wilcoxon rank sum test. Categorical variables were compared using the Fisher exact test, and YOS scores were compared using the Wilcoxon rank sum test. All tests were based on 2-tailed alternatives. P ≤ .05 was considered significant.

Multivariable Analysis

A logistic regression analysis was performed with bacterial infection as the dependent variable and the following independent variables: age (grouped in categories of ≤3 or >3 months), YOS score (grouped as well-appearing [YOS score ≤10] or ill-appearing [YOS score >10]), temperature, ANC, and band count. The purpose of this analysis was to determine whether the band count (represented as the percentage band count, the ABC, or BNR) added significant information after adjusting for important clinical variables (ie, age, temperature, clinical appearance) and hematologic information available from an automated CBC (ie, ANC).

In addition, we performed 3 abbreviated subanalyses. In the first subanalysis, we assumed all patients with negative blood and urine cultures had viral infections. The intent of this subanalysis was to determine whether our findings for patients with documented respiratory viral infections could be generalized to all culture-negative patients with presumed viral infections. In an additional subanalysis, we excluded patients with positive urine cultures who had fewer than 5 WBC per high-powered field on urinalysis, because these results could be interpreted as asymptomatic bacteriuria. In the last subanalysis, we compared patients with RSV infections with those with UTIs (with pyuria ≥5 WBC per high-powered field), as these represented the most common infections in the viral and bacterial groups, respectively.

The statistical analyses were performed using Stata statistical software, version 5.0.39

can American, 18 were white, 50 were Latino, 16 were Asian, and 2 were of other ethnicity, with no significant difference in ethnic or racial distribution between bacterial and viral groups (P = .10).

The 316 patients who had negative bacterial cultures and either did not have respiratory specimens obtained or had negative respiratory viral studies were excluded from the primary analysis.

PRIMARY ANALYSIS

Univariable Analysis

Patients with bacterial infections were significantly older, and had significantly higher temperatures, WBCs, and ANCs than patients with respiratory viral infections (Table 1). There were no significant differences in YOS score, percentage band counts, ABC, or BNR between patients with bacterial and viral infections (Table 1). Otitis media was identified in 6 (9%) of 69 patients with viral infections and 4 (13%) of 31 patients with bacterial infections (P = .50). There were 30 patients aged 2 months and younger (7 with bacterial infection, 23 with viral infection). In this youngest age group, patients with bacterial infections had significantly higher ANCs than patients with viral infections (10.3 vs 3.3 × 10^9/L; P < .01). There were no significant differences in percentage band counts (14.7% vs 12.6%; P = .66), ABC (2.1 vs 1.5 × 10^9/L; P = .25), or BNR (32.5% vs 40.7%; P = .42, bacterial vs viral, respectively); however, there were insufficient patients in this youngest age group to make statistically powerful comparisons.

Multivariable Analysis

In the primary multivariable analysis, after adjusting for age, temperature, YOS score, and ANC, the band count (represented in 3 separate regression analyses as the percentage band count, the ABC, or BNR) did not add significant discriminatory information (Table 2). Only temperature (P < .01) and ANC (P < .01) retained significant associations with bacterial infection in this analysis. The adjusted odds ratios (ORs) for the band parameters in the multivariable analysis denote the change in odds of bacterial infection per unit increase in the band parameter after adjusting for age, temperature, YOS score, and ANC. Therefore, an OR less than 1 for the band parameter represents a decrease in the adjusted odds of bacterial infection with increasing band count.
In the first subanalysis, we compared patients with bacterial illness (bacteremia or UTI) with all patients with negative blood and urine cultures, regardless of whether nasopharyngeal specimens had been obtained for respiratory viral identification. Mean band counts were 13.5% in the bacterium group and 13.3% in the respiratory viral group (difference, 0.2 percentage points; 95% CI, −4.1 to 4.6; P = .99). The percentage band counts (adjusted OR = 0.99 for every 1 × 10^9/L increase in ABC; 95% CI, 0.91 to 1.04; P = .43), ABC (adjusted OR = 0.74 for every 1 × 10^9/L increase in ABC; 95% CI, 0.48 to 1.15; P = .19), and BNR (adjusted OR = 0.99 for each increase of 1 percentage point in BNR; 95% CI, 0.95 to 1.02; P = .41) did not add significant predictive information after adjusting for the age, temperature, YOS score, and ANC.

In this second subanalysis, we excluded the 5 patients with positive urine cultures who had less than 5 WBC per high-power field on urinalysis, because we could not exclude the possibility that they had asymptomatic bacteriuria. Mean band counts were 14.8% in the bacterium group and 13.3% in the respiratory viral group (difference, 1.5 percentage points; 95% CI, −3.1% to 6.1%; P = .52). The results of the multivariable analysis were unchanged from the primary analysis.

In the last subanalysis, we compared patients with RSV infections with those with UTIs (with pyuria ≥ 5 WBC per high-power field), as these represented the most common infections in the viral and bacterial groups, respectively. Mean band counts were 15.2% in the UTI group and 13.4% in the RSV group (difference, 1.8 percentage points; 95% CI, −5.4% to 7.0%; P = .49). The percentage band count (adjusted OR = 0.97 for each increase of 1 percentage point in band count; 95% CI, 0.91 to 1.04; P = .43), ABC (adjusted OR = 0.74 for every 1 × 10^9/L increase in ABC; 95% CI, 0.48 to 1.15; P = .19), and BNR (adjusted OR = 0.99 for each increase of 1 percentage point in BNR; 95% CI, 0.95 to 1.02; P = .41) did not add significant predictive information after adjusting for the age, temperature, YOS score, and ANC.

**Table 1. Univariable Comparisons of Patients With Bacterial and Respiratory Viral Infections**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Bacterial Infection (n = 31)</th>
<th>Respiratory Viral Infection (n = 69)</th>
<th>Difference Between Means or Percentages (95% CI)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean (± SD), mo</td>
<td>6.2 (5.4)</td>
<td>4.1 (4.4)</td>
<td>2.1 (0.1 to 4.1)</td>
<td>.04</td>
</tr>
<tr>
<td>Aged &lt; 3 mo, No. (%)</td>
<td>11 (35)</td>
<td>39 (57)</td>
<td>−22 (−43 to 0)</td>
<td>.08</td>
</tr>
<tr>
<td>Median YOS score (range)</td>
<td>10 (6-18)</td>
<td>8 (6-18)</td>
<td>Not applicable</td>
<td>.67</td>
</tr>
<tr>
<td>YOS score &gt; 10, No. (%)</td>
<td>5/31 (16)</td>
<td>11/69 (16)</td>
<td>0 (−16 to 16)</td>
<td>&gt;.99</td>
</tr>
<tr>
<td>Temperature, mean (± SD), °C</td>
<td>39.7 (0.9)</td>
<td>39.9 (0.7)</td>
<td>0.7 (0.4 to 1.1)</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>WBC, mean (± SD), 10^9/L</td>
<td>18.0 (5.8)</td>
<td>13.3 (5.5)</td>
<td>4.7 (2.3 to 7.1)</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>WBC ≥ 15 × 10^9/L, No. (%)</td>
<td>21/31 (68)</td>
<td>18/69 (26)</td>
<td>42 (21 to 63)</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>ANC, mean (SD), 10^9/L</td>
<td>11.3 (5.1)</td>
<td>5.9 (4.2)</td>
<td>5.4 (3.5 to 7.4)</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>ANC ≥ 10 × 10^9/L, No. (%)</td>
<td>19/31 (61)</td>
<td>10/68 (15)</td>
<td>46 (27 to 65)</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>ABC, mean (± SD), 10^9/L</td>
<td>2.2 (1.5)</td>
<td>1.9 (1.7)</td>
<td>0.3 (−0.3 to 1.1)</td>
<td>.31</td>
</tr>
<tr>
<td>ABC ≥ 0.5 × 10^9/L, No. (%)</td>
<td>27/31 (87)</td>
<td>52/68 (76)</td>
<td>11 (−6 to 28)</td>
<td>.29</td>
</tr>
<tr>
<td>Percentage band count, mean (± SD)</td>
<td>13.5 (9.6)</td>
<td>13.3 (10.3)</td>
<td>0.2 (−4.1 to 4.6)</td>
<td>.90</td>
</tr>
<tr>
<td>Band-neutrophil ratio, mean (± SD)</td>
<td>0.24 (0.19)</td>
<td>0.33 (0.24)</td>
<td>−0.09 (−0.18 to 0.01)</td>
<td>.08</td>
</tr>
<tr>
<td>Band-neutrophil ratio ≥ 0.20, No. (%)</td>
<td>16/31 (52)</td>
<td>46/68 (68)</td>
<td>−16 (−37 to 0)</td>
<td>.18</td>
</tr>
</tbody>
</table>

* CI indicates confidence interval; YOS, Yale Observation Scale; WBC, white blood cell count; ANC, absolute neutrophil count; and ABC, absolute band count.
† There were 24 patients with urinary tract infections (20 due to Escherichia coli; 3 Klebsiella species; and 1 Enterococcus species) and 7 patients with bacteremia (4 due to Streptococcus pneumoniae, 1 each due to Streptococcus agalactiae, Salmonella species, and Moraxella catarrhalis).
‡ There were 59 patients with respiratory syncytial virus, 6 with parainfluenza, 2 with influenza, and 2 with adenovirus infections.

**Table 2. Marginal Contribution of the Band Count After Adjusting for Age, Temperature, YOS, and ANC in 3 Separate Multivariable Analyses**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Adjusted Odds Ratio†</th>
<th>95% Confidence Interval</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage band count</td>
<td>0.97</td>
<td>0.92-1.03</td>
<td>.37</td>
</tr>
<tr>
<td>ABC</td>
<td>0.72</td>
<td>0.49-1.05</td>
<td>.09</td>
</tr>
<tr>
<td>BNR</td>
<td>0.99</td>
<td>0.96-1.02</td>
<td>.40</td>
</tr>
</tbody>
</table>

* YOS indicates Yale Observation Scale; ANC, absolute neutrophil count; ABC, absolute band count; and BNR, band-neutrophil ratio.
† The odds ratios denote the change in odds of bacterial infection per 1 percentage point increase in band count, 1 × 10^9/L increase in ABC, and 1 percentage point increase in BNR, after adjusting for age, temperature, YOS, and ANC. An odds ratio < 1 represents a decreasing odds of bacterial infection with increasing value of the independent variable after adjusting for age, temperature, YOS, and ANC.

**COMMENT**

In this study of young febrile children with laboratory-documented bacterial or respiratory viral infections, several variables were significantly associated with bacterial infection, including age, temperature, WBC, and ANC. The band count, however, whether represented as the percentage band count, the ABC, or the BNR, was similar between children with bacterial and respiratory viral infections. In the univariable analysis, the point estimate of the difference in percentage band count between groups was 0.20%. Not only is this value clinically unimportant, but the extremes of the 95% CI for this estimate (4.1% favoring viral infection or 4.6% favoring bacterial infection), are likely clinically unimportant as well. More important, the band count did not help distinguish bacterial infections from respiratory viral infections in the multivariable analysis after adjusting for readily available clinical information (age, temperature, clinical appearance) and hematologic information available from...
an automated CBC (ie, ANC). The results did not significa-

nantly differ in our subanalyses in which we as-

sumed all culture-negative patients had viral infections, 

when we limited our definition of UTI to culture-

positive urine and pyuria, or when we compared only pa-

tients with RSV infections with those with UTIs.

Some investigators have previously studied the role 

of the CBC and its different components in identifying 

febrile children with occult bacterial infections. The band 

count has been used and/or evaluated as one of several 

criteria to assess the risk of bacterial illness in young fe-

brile children.* Studies of the predictive value of the CBC, 

however, vary in many ways, including the age group ex-

amined, the presence of overt focal infections, and the 

statistical methods used.

It is well known that an increased number of bands 

is commonly seen in the peripheral blood smears of chil-

dren with bacterial illnesses. Several studies have used 

and/or supported the use of band counts to identify fe-

brile infants younger than 3 months with bacterial infec-

tions.4-10,44,45 Only one of these studies, however, evalu-

ated the marginal contribution of the band count for the 

prediction of bacterial illness in a multivariable analy-

sis.12 In that study, a band count of 0.5 × 10^9/L or higher 

was correlated with bacterial infection by stepwise dis-

criminant analysis. Other investigators have not found 

the band count to be useful in identifying bacterial infections 

in these young infants.10,11,40 In pediatric patients 3 months 

and older, there is also disagreement regarding the utility 

of bands counts for the evaluation of fever.5,20,22-29,41-43

Our study differs from these previous studies in some 

important ways. All of the peripheral blood smears in our 

study were evaluated by one senior technologist, thus elimi-

nating the issue of interobserver differences in interpret-

ing band counts.46 In addition, previous studies have un-

commonly used multivariable statistical methods, and thus 

lack adjustment for the presence of other important as-

sociated and confounding variables. In the present study 

we used multivariable statistical methods to determine 

whether the band count offered any significant addi-

tional information regarding the prediction of bacterial ill-

ness after adjusting for important clinical information (age, 

temperature, clinical appearance) and hematologic infor-

mation available from an automated CBC with total neu-

rophil count (ie, ANC). With these methods, we found 

that the band count did not add additional information 

distinguishing bacterial and viral infections.

Several previous investigators have noted elevated 

band counts in patients with viral infections as ob-

served in many of the patients in the present study. One 

study reported that leukocytosis and elevated band counts 

were seen in patients with severe viral lower respiratory 

tract infections compared with those with asymptom-

atic infections with the same viruses.44 Additional stud-

ies have reported elevated band counts in children with 

influenza infections23 as well as in hypoxic children with 

RSV infections.27 Elevated band counts in viral disease 

do not appear to be limited to patients with lower res-

piratory tract infections. One group of investigators found 

that many patients with proven enterovirus and rotavi-

*References 5, 10-14, 16-18, 20, 22-25, 27-29, and 40-43.

rus infections, as well as patients with influenza and RSV 

infections, had elevation of their band counts31 and would 

have been considered to be at high risk for bacterial ill-

ness based on band criteria advocated by some.20

T

HERE ARE SOME Limitations to this study. The 

study was conducted during the winter months and the majority of the patients with 

laboratory-documented viral illness had RSV 

infections. We excluded patients with clearly 

evident viral syndromes known to be associated with high 

fevers (ie, croup, gingivostomatitis, and varicella), because 

ethical considerations precluded obtaining laboratory tests 

on these patients. We therefore cannot necessarily gener-

alize our findings to all viral pathogens. Presumably, many 

of the patients with both negative bacterial cultures and nega-

tive respiratory viral antigen studies (as well as patients who 

did not have nasopharyngeal specimens obtained) also had 

viral illnesses. These other viruses might have been detected 

if sites other than the nasopharynx had been sampled for 

viral detection. Because these patients did not have a proven 

viral or bacterial diagnosis, we excluded them from our pri-

mary analysis. In the subanalysis in which we assumed all 

patients with negative blood and urine cultures had viral 

infections, however, the results were unchanged, as the band 

count did not contribute significant predictive information. 

Although it is possible that some of the culture-negative pa-

tients may have actually had clinically occult bacterial in-

fections, this is unlikely for several reasons. All of these pa-

tients had negative blood cultures and all of those with signs 

of lower respiratory tract infections had chest radiographs 

with no evidence of lobar pneumonias. Finally, urine samples 

were obtained from more than 90% of girls in this study, 

as well as more than 90% of boys younger than 6 months 

of age as recommended by guidelines for the evaluation of 

young febrile children.3

Most of the patients with bacterial infections in our 

study had UTIs rather than bacteremia. The results of this 

study, however, reflect the typical prevalence of UTIs and 

bacteremia in young febrile children evaluated as out-

patients. The results of this study did not appreciably 

change in the subanalysis in which we included only pa-

tients with UTIs in the bacterial infection group. The data 

in this study concur with those of a large study of occult 

pneumococcal bacteremia, in which the band count did 

not add significant predictive information after adjusting 

for age, temperature, and ANC.7 Although there were no 

patients with meningococcal infections in this study, clini-

cally unsuspected meningococcal infections in young fe-

brile pediatric outpatients are very uncommon.47 There-

fore, despite the fact that band counts are frequently 

elevated in children with meningococcal infections,48 the 

utility of routinely using the band count as a screen for 

clinically unsuspected meningococcal disease is low.49

The number of patients with documented bacterial 

and respiratory viral infections was insufficient to stratify 

the analysis for patients younger and older than 3 months. 

Although we did not find significant differences in band 

counts between patients with bacterial and viral infections 

in the younger age group, there was insufficient statisti-

cal power to detect differences of small magnitude because
of the small number of patients in this age group. It has been previously reported that the percentage and absolute band counts are similar in normal, healthy children between the ages of 15 days and 2 years. The band response to infection, however, may be different in young children of different ages. In the multivariable analysis, therefore, we adjusted for age younger or older than 3 months. In addition, when we assumed all culture-negative patients had viral infections and therefore had greater power to detect small differences, the results and conclusions were the same. A larger study of the utility of band counts in febrile patients younger than 3 months would be useful.

In conclusion, the band count does not routinely help to distinguish young febrile children with respiratory viral infections from children with UTI and bacteremia after taking into account readily available clinical information (age, temperature, clinical appearance) in addition to the ANC, which can be measured with an automated cell counter. These results suggest that if the clinician obtains a CBC in the evaluation of the young febrile child, routine manual inspection of the peripheral blood smear to determine the band count is unnecessary.

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REFERENCES


