

Original Research

Analysis of bacterial infections in children

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ABSTRACT:

Background: Fever is one of the most common conditions that children with pediatric emergencies present with. The present study was conducted to assess serious bacterial infections (SBI) in children. **Materials & Methods:** 92 children having serious bacterial infections (SBI) of both genders were selected. When a child had signs of dyspnea and a positive blood culture, or when the child's chest radiograph revealed consolidation and their C reactive protein (CRP) level was more than 1000 µg/dl, it was determined that the child had bacterial pneumonia. **Results:** Out of 92 children, males were 50 and females were 42. Common bacterial infections were dysentery in 15, upper respiratory tract infection in 18 patients, bronchopneumonia in 3, urinary tract infection in 14, severe acute malnutrition in 9 cases, enteric fever in 16, bacterial meningitis in 7, and bronchiolitis in 10 cases. The difference was significant ($P < 0.05$). **Conclusion:** Bronchopneumonia, urinary tract infections, severe acute malnutrition, enteric fever, bacterial meningitis, and bronchiolitis were among the prevalent bacterial infections detected in children.

Key words: Bacterial meningitis, children, urinary tract infections

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INTRODUCTION

Fever is one of the most common conditions that children with pediatric emergencies present with. Few studies have been conducted in developing countries, although in the United States, fever is the reason for more than 20% of pediatric emergency room visits.¹ Fever can be caused by non-infectious (autoimmune, environmental, or drug-related) as well as infectious (bacterial, viral, or parasite) sources. Young newborns (0-90 days) are more susceptible to severe bacterial infections (SBI), which include bacteremia, meningitis, pneumonia, and urinary tract infections. This is because of their immature immune systems and lack of localizing symptoms. Reports state that 7–11% of premature newborns have SBI.²

SBI in children is associated with a significant risk of morbidity and death. Meningococcal disease (MCD), often known as septicaemia or meningitis caused by *Neisseria meningitidis*, is the most common and frequently fatal bacterial infection in children in the United Kingdom. The UK still has a higher incidence of it than other European countries, notwithstanding a decline since the serogroup C12 conjugate immunization was implemented. Delays in receiving treatment for MCD and other severe sepsis increase

the chance of long-term disability and mortality rates.³ Pneumonia and urinary tract infections are the most common SBIs observed in pediatric emergency rooms (UTI). The introduction of effective immunizations against *Streptococcus pneumoniae* and *Haemophilus influenzae* type b (Hib) has reduced the incidence of bacterial pneumonia; yet, consequences from pneumonia still occur.⁴ The present study was conducted to assess serious bacterial infections (SBI) in children.

MATERIALS & METHODS

The present study comprised of 92 children having serious bacterial infections (SBI) of both genders. Parental consent was obtained before starting the study.

Data such as name, age, gender etc. was recorded. When a child had signs of dyspnea and a positive blood culture, or when the child's chest radiograph revealed consolidation and their C reactive protein (CRP) level was more than 1000 µg/dl, it was determined that the child had bacterial pneumonia. Five milliliters of venous blood were drawn for biochemical and haematological analysis. Every patient's clinical profile was kept on file. Results thus

obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of children

Total- 92		
Gender	Males	Females
Number	50	42

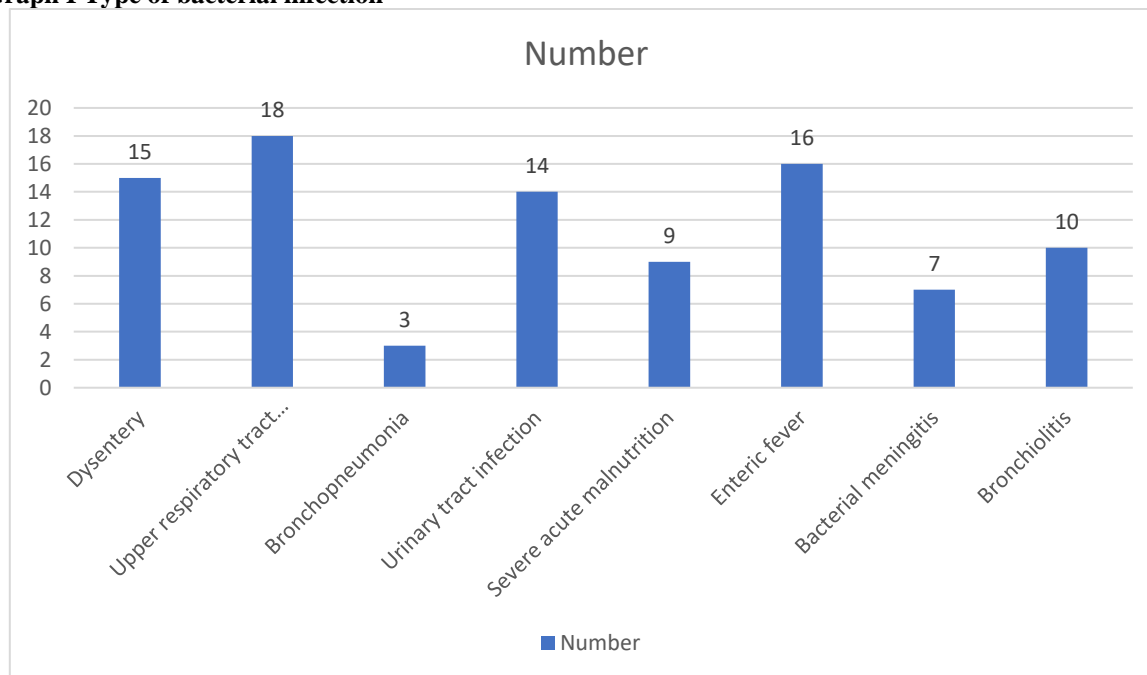
Table I shows that out of 92 children, males were 50 and females were 42.

Table II Type of bacterial infection

Bacterial infection	Number	P value
Dysentery	15	0.04
Upper respiratory tract infection	18	
Bronchopneumonia	3	
Urinary tract infection	14	
Severe acute malnutrition	9	
Enteric fever	16	
Bacterial meningitis	7	
Bronchiolitis	10	

Table II, graph I shows that common bacterial infections was dysentery in 15, upper respiratory tract infection in 18 patients, bronchopneumonia in 3, urinary tract infection in 14, severe acute malnutrition in 9 cases, enteric fever in 16, bacterial meningitis in 7, and bronchiolitis in 10 cases. The difference was significant (P< 0.05).

Graph I Type of bacterial infection



DISCUSSION

Pneumonia remains the primary cause of death for children globally. Pediatric UTIs are placing a significant and increasing strain on hospital services. The UK saw a 39% increase in hospital admission rates for children with UTIs between 2001 and 2011. A UTI may increase the risk of septicemia and meningitis, especially in young children or newborns with weakened immune systems.⁵ About one-third of children with upper urinary tract infections develop kidney scarring. The foundation of sepsis therapy is the early diagnosis and treatment of SBI, which improves outcomes. Clinical guidelines often refer to

the 'golden hour' of sepsis therapy.⁶ Antibiotics should be begun as soon as severe sepsis is suspected, as evidenced by research demonstrating that every hour that treatment is postponed increases mortality. Antibiotics are usually given more than two hours after a child who appears in the emergency room with suspected sepsis. In the case of MCD, prehospital antibiotics reduce mortality, but delays in antibiotic delivery are associated with higher mortality.⁷ Early in the course of the illness, MCD signs and symptoms are nonspecific and develop rapidly. A little more than half of children with MCD are not diagnosed when they first seek medical

attention.^{8,9}The present study was conducted to assess serious bacterial infections (SBI) in children.

We found that out of 92 children, males were 50 and females were 42. Trautner et al¹⁰ have investigated whether clinical indicators can identify children who have hyperpyrexia, who are at risk for serious bacterial infections. Prospectively, data was gathered from all children under the age of eighteen who visited a pediatric emergency room within a two-year period and had rectal temperatures below 106°F. A complete blood cell count, physical examination, blood cultures, nasopharyngeal viral cultures, and medical histories were done on each patient. Thirty-three children out of them had hyperpyrexia. Out of the 103 individuals, 22 had viral illnesses that had been diagnosed in a lab environment, and one had a coinfection of bacteria and viruses. Twenty of the patients had serious bacterial infections.

We observed that common bacterial infections was dysentery in 15, upper respiratory tract infection in 18 patients, bronchopneumonia in 3, urinary tract infection in 14, severe acute malnutrition in 9 cases, enteric fever in 16, bacterial meningitis in 7, and bronchiolitis in 10 cases. In a study by Elzouki et al¹¹ a group of children (112) at different phase of development, i.e. neonates, infants, preschool and school children were studied for symptomatic UTI. The most common clinical presentations were loin pain (56.4%), fever (50.0%), diarrhea and vomiting (47.4%) in school, preschool and infant groups respectively. In the neonatal group all patients presented with sepsis. In school children fever was more common in those with radiological abnormalities vs those without. In neonates, intrauterine growth retardation was more common in those with radiological abnormalities (p less than 0.012). Radiological abnormalities were more common in male school children than in female. Renal scarring occurred mainly in school children whereas VUR occurred mainly in infants. As male children advance in age there is increased risk of radiological abnormalities. There is an increased percentage of E. coli as causative organism as age

increases; from 48.3% in neonates to 74.5% in school children.

CONCLUSION

Authors found that bronchopneumonia, urinary tract infections, severe acute malnutrition, enteric fever, bacterial meningitis, and bronchiolitis were among the prevalent bacterial infections detected in children.

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