

Original Research Article

Seasonal variations among admitted paediatric patients at tertiary care hospital, Gadap Town, Karachi, Pakistan

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ABSTRACT

Background: In pediatrics, the season is one of the elements contributing to the etiological factors of community based diseases. Awareness of this variation can help the physicians for prevention and counseling of the patients. A cross-sectional observational study was designed with non-probability convenient sampling technique to determine the frequency of patients admitted to the paediatric ward of the hospital in a whole calendar year and to ascertain which disease presentation is most common.

Methods: Study conducted at paediatric ward of Al-Tibri Medical College and Hospital Karachi, Pakistan having patients admitted during May 2018 to April 2019. After ethical approval and informed consent from their parents/guardian, a total of 734 paediatric patients that were admitted from paediatric OPD/ emergency were selected for the study. Paediatric patients that were referred, in emergency/ ICU and surgical paediatric patients were excluded from the study. Chi-square test was applied to evaluate the statistical variation among the patients.

Results: From the 734 patients, 357 (48.6%) patients were of acute gastroenteritis, 104 (14.2%) of respiratory illness, 86 (11.7%) of viral fever, 67 (9.1%) of urinary tract infection, 36 (4.9%) of neurological illness, 29 (4.0%) of protein calorie malnutrition, 25 (3.4%) of enteric fever, 20 (2.7%) of haematological illness and 10 (1.4%) patients were admitted due to sepsis.

Conclusion: Our study concluded that majority of the patients admitted were of acute gastroenteritis / admitted due to gastric issues, therefore further studies in the vicinity would help to better understand the issues and help plan a strategy to combat the diseases.

Keywords: Acute gastroenteritis, Pediatrics, Pediatric illnesses, Seasonal

INTRODUCTION

Due to extensive drug-resistant organisms, the prevalence and management of infectious disease in children, particularly infants, is increasingly difficult. Inflammatory diseases (68 %) including pneumonia (18 %), diarrhoea (15%), and malaria (8%) are the most common causes of neonatal / pediatric deaths worldwide.

About two-thirds of pediatric no neonatal deaths in this region are the result of pneumonia, diarrhea and malaria.¹ The clinical management of children admitted into the hospital requires nutritional support.² In most children, the median duration of hospital stay is only a few days, but in some children with chronic or underlying conditions can be significantly longer. The focus of attention is mainly on the primary medical problem

during your short stay. The child's nutritional status is still low, while the prevalence of acute and chronic malnutrition in children admitted to hospital was well known since the early 1980s to depend heavily upon the criteria applied to it.³ The acute, chronic or mixed type can be malnutrition. Acute malnutrition is really the form commonly seen in disease, but children who are admitted to the hospital as a result of acute disease may also suffer from chronic malnutrition.⁴ Emergency admission rates and short stay admissions for minor diseases in children throughout the UK are on the rise.⁵ The mean hospital length in the UK has dropped from 3.9 to 1.9 days in comparison over the past 30 years.⁶ There is a significant variation in the mean LOS for children and young people across the United Kingdom in 2009 reported between 0, 1 and 4, 4 days.⁷ Adverse clinical events are linked to long lasting LOS and evidence suggests that shorter stays do not compromise the quality of care.⁸

Adverse clinical events are associated with prolonged LOS, and there is evidence to suggest that shorter length of stay does not compromise care quality.⁹ Few studies investigated LOS-related factors for acute pediatrics, mainly with a view to the link with socio-economic position (SEP).^{10,11} These were not concluded, possibly because the definition of LOS, age, diagnostic groups and SEP measurement were different.¹² Latest research has clear evidence that admission in the hospital and stay days are suitable for adults, but very few studies have assessed this use in general pediatric stay environments.¹³⁻¹⁵

The objective of this study was to determine the prevalence of the patients admitted to the paediatric ward of the hospital in a whole calendar year. Determining the highest rate of disease admission as well as the most patients presenting in each and every month would help in better providence of facilities to the patients and help in improving the outcomes of patients that are admitted.

METHODS

A Prospective observational study using nonprobability convenient sampling technique was carried out at the Paediatric ward of Al-Tibri Medical College and Hospital Karachi, Pakistan in which the patients admitted during the period January 2018 to December 2018. Approval for collecting of data was taken from the ethical review board of the hospital. After taking informed consent from their parents/ guardian, a total of 734 paediatric patients that were admitted from paediatric OPD/ emergency were selected for the study. Patient more than one month of age and under 12 years, either admitted through OPD or emergency were included in this study. Paediatric patients less than one month of age and more than 12 years, patients that were referred from the OPD to other hospitals, under observation in emergency or day-care unit and ICU. Patients from surgical department of paediatric were excluded from this study. Data was analysed using SPSS version 20.0. Data was collected and analysed by trained healthcare professionals. Descriptive statistics included age, gender, duration of hospital stay, month of admission, season, outcome of admitted patients, mode of discharge and diagnosis. Frequency and percentages were calculated and presented.

RESULTS

Among the 734 patients admitted in the paediatric ward during the year 2018-2019, 284 (38.7%) of the patients were infants, 289 (39.4%) patients were between the age group of 1-4 years, 106 (14.4%) were between the ages 5-8 and 55 (7.5%) were between 9-12 years of age. From the 734 patients, 423 (57.6%) were males and 311 (42.4%) were females. 577 (78.6%) of the patients were discharged between 1-3 days while 146 (19.9%) between 4-7 days and only 11 (1.5%) patients were discharged after 7 days (Table 1).

Table 1: Baseline demographics of patients admitted in paediatric ward.

Variables	N= 734		P value
Age (years)	Infant	284 (38.7%)	0.01
	1-4	289 (39.4%)	
	5-8	106 (14.4%)	
	9-12	55 (7.5%)	
Gender	Male	423 (57.6%)	0.08
	Female	311 (42.4%)	
DOHS (days)	1-3 days	577 (78.6%)	0.13
	4-7	146 (19.9%)	
	>7	11 (1.5%)	

In January, 56 (7.6%) patients were admitted. In February, 55 (7.5%) were admitted, in March 70 (9.5%), in April 62 (8.4%), in May 88 (12%), in June 55 (7.5%), in July 95 (12.9%), in August 86 (11.7%), in September

54 (7.4%), in October 39 (5.3%), in November 26 (3.5%) and in December 48 (6.5%) patients were admitted to the paediatric ward (Table 2).

Table 2: Frequency of patients admitted in each month in 2018-2019.

Months	Frequency (%) n=734	P value
January 2019	56 (7.6%)	0.14
February 2019	55 (7.5%)	
March 2019	70 (9.5%)	
April 2019	62 (8.4%)	
May 2018	88 (12%)	
June 2018	55 (7.5%)	
July 2018	95 (12.9%)	
August 2018	86 (11.7%)	
September 2018	54 (7.4%)	
October 2018	39 (5.3%)	
November 2018	26 (3.5%)	
December 2018	48 (6.5%)	

From the 734 admitted patients, 357 (48.6%) patients were of acute gastroenteritis, 104 (14.2%) were due to respiratory illness, 86 (11.7%) due to viral fever, 67 (9.1%) due to urinary tract infection, 36 (4.9%) due to neurological illness, 29 (4.0%) due to protein calorie malnutrition, 25 (3.4%) due to enteric fever, 20 (2.7%)

due to haematological illness and 10 (1.4%) patients were admitted due to sepsis. (Table 3).

There were 431 (58.7%) patients among 734 were discharged on doctor’s advice, 241 (32.8%) were discharged on request, 51 (6.9%) patients left against medical advice, 07 (1.0%) patients were referred and only 04 (0.5%) of patients died during hospital stay (Table 4).

Table 3: Diagnosis of admitted patients in paediatric ward in 2018-2019.

Diagnosis (n=734)	Frequency (%)	P value
AGE	357 (48.6%)	<0.001
Respiratory Disease	104 (14.2%)	
Viral Fever	86 (11.7%)	
Urinary Tract Infection	67 (9.1%)	
Neurological disease	36 (4.9%)	
Protein calorie malnutrition	29 (4.0%)	
Enteric Fever	25 (3.4%)	
Haematological disease	20 (2.7%)	
Sepsis	10 (1.4%)	

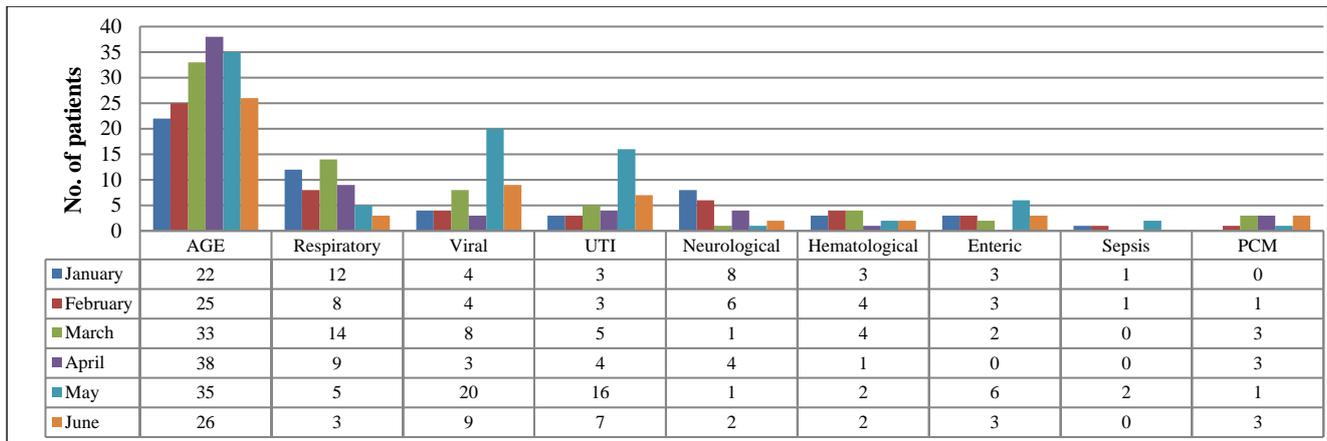


Figure 1: Diagnosis vs month of admission from May June 2018 and January April 2019.

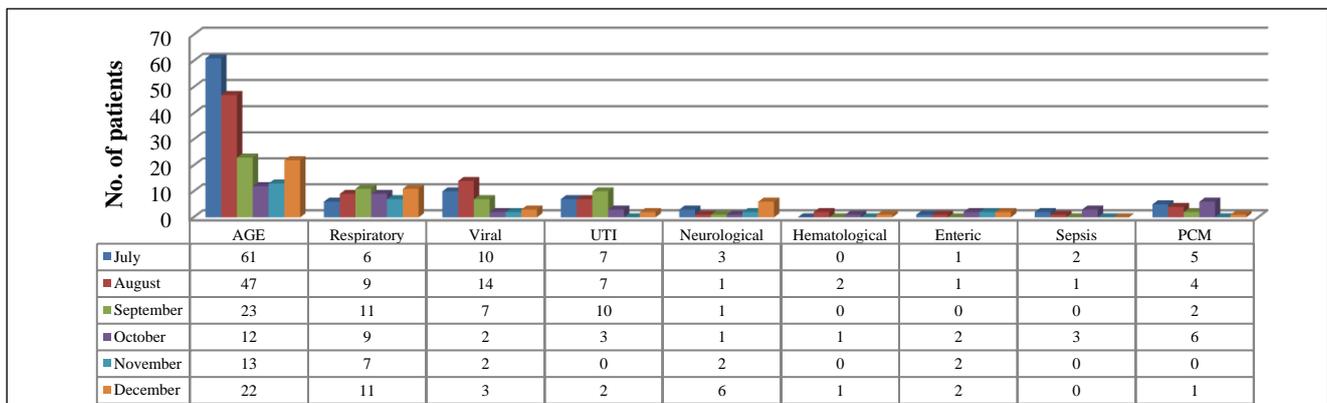


Figure 2: Diagnosis vs month of admission from July 2018 till Dec 2018.

Table 4: Mode of Discharge of paediatric ward patients in 2018-2019.

Mode of Discharge	Frequency (%) n=734	P value
Discharged	431 (58.7%)	<0.001
Discharge on request	241 (32.8%)	
Left against medical advice	51 (6.9%)	
Referred	07 (1.0%)	
Death	04 (0.5%)	

The diagnoses of patients admitted from January-April 2019 and May-June 2018 and from July 2018 to December 2018 have been depicted in Figure 1 and 2. Chi-square test was applied to test the significance. A significant p-value of <0.001 was observed.

DISCUSSION

In our study, majority of the patients admitted to the paediatric ward were of acute gastroenteritis with peaks during July and August. Next patients with respiratory illnesses mostly presented in the month of January and March. Viral diseases had a peak during the month of May. In the same month, a peak of patients admitted for urinary tract infection was also observed. Overall majority of the patients were admitted during the months of July and August. During the whole duration of the study, only 04 deaths were observed, all of which were due to sepsis. A study by Gordon et al, in Gondar, Ethiopia reported that most of their admissions were due to respiratory, nutritional or infectious diagnosis (47.5, 46.8 and 36.5%, respectively). Conditions diagnosed most commonly (>200 cases) included community-acquired pneumonia (812 cases), severe acute malnutrition (381), anemia (274) and acute gastroenteritis (219). Peak of patients was seen in October and November. The median length of stay was 4.0 days (interquartile range 2-10 days).¹⁶ In a study by Ghafri et al, the prevalence of LAMA was 8.49% having no seasonal variations or any other significant difference between general and subspecialty wards.¹⁷ A study by Schrijver et al, the four diseases that fulfilled our definition of seasonality: respiratory tract infections (peak in January), gastroenteritis (peak in February– March), functional complaints (peak in March and November), and asthma (peak in March and October). Together, these four categories comprised 21.2% of all newly referred patients.¹⁸ Another study by Nelson et al on 3796 paediatric patients reported that out the 3796 paediatric patients, 245 (6.5%) had gastroenteritis, while majority were of minor trauma i.e 847 (22.3%) and then of respiratory infection i.e 761 (20%).¹⁹ A research by Pieścik-Lech et al, reported that in Europe, it is estimated that the incidence of diarrhoea ranges from 0.5 to 1.9 episodes per child per year in children up to 3 years of age. In low- and middle income countries, while the

incidence of acute diarrhoea has declined from 3.4 episodes/child year in 1990 to 2.9 episodes/child year in 2010, the incidence of AGE remains high, especially in infants aged 6-11 months (4.5 episodes/child year). Moreover, worldwide diarrhoea remains one of the leading causes of mortality among children younger than 5 years.²⁰

In another study by King et al demonstrated that among children in the United States, acute gastroenteritis remains a major cause of morbidity and hospitalization, accounting for >1.5 million outpatient visits, 200,000 hospitalizations, and approximately 300 deaths/year. Direct medical costs for rotavirus diarrhea, which represents approximately one third of all hospitalizations for diarrhea among U.S. children aged <5 years, have been estimated to be \$250 million/ year, with an estimated \$1 billion/year in total costs to society. Worldwide, diarrheal diseases are a leading cause of paediatric morbidity and mortality, with 1.5 billion episodes and 1.5-2.5 million deaths estimated to occur annually among children aged <5 years.²¹ From the point of view of studies done in Pakistan, most studies have been carried out in either the neonatal departments of various hospitals in Multan, Rahim Yar Khan, Faisalabad, Rawalpindi and Karachi. Similarly studies have been done in paediatric emergency department but next to none of the studies have focused solely on paediatric wards.²²⁻²⁴ Although we have studied the prevalence of diseases with which patients have been admitted in the paediatric ward, our study might not be immune from selection bias, observer bias, diagnostic bias as well as we did not cover the treatments given to the patients along with their recovery, which could have extended the length of stay of these patients.

CONCLUSION

Authors study concluded that majority of the patients admitted were of acute gastroenteritis/admitted due to gastric issues, therefore further studies in the vicinity would help to better understand the issues and help plan a strategy to combat the diseases.

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