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INCREASED HOSPITAL STAY;

RISK FACTORS ASSOCIATED WITH INCREASED HOSPITAL STAY IN CHILDREN.

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ABSTRACT… Objectives: This study aims to scientifically fill the gap and provide the scientific data regarding risk factors associated with prolonged length of hospital stay (PLOS) in children admitted at Isra University Hospital. **Study Design:** Descriptive case series study. **Setting:** Pediatric ward of Isra University Hospital Hyderabad. **Period:** 22 months from February 2016 till November 2017. **Material and Methods:** All the children having age ≥ one year and less than 10 years hospitalized due to any cause of either gender were enrolled under this study. A proforma was designed comprising of basic demographic variables like age and gender and relevant questions like cause of hospitalization, risk factors associated with PLOS, and duration of hospital stay. All the information was noted in proforma and analyzed using SPSS version 17.0. **Results:** In present study we collected data of 188 children. In group A (age >1 to 5 years) there were 109 children consisted of 57.97% and remaining group B (age >6 years to 10 years) there were 79 children consisted of 42.02%. The overall mean duration of hospital stay with SD was 12.21 ± 3.14. The mean age and SD of group A was 2.33 ± 1.09 years and group B was 7.01 ± 2.39 years. Children with Group A (age ≥1 year to 5 years), Females, late seeking of medical attention, children not responding on medical treatment, and those who get infected during hospitalization were significantly associated with prolonged length of hospital stay ($p < 0.05$). **Conclusion:** Younger children with age less than 5 years having female predominance and delayed seeking of medical attention were the most significant risk factors associated with PLOS in our population.

Key words: Prolonged Length of Hospital Stay, Risk Factors, Children, Pakistan.

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INTRODUCTION

Younger children are more prone to infections and allergies due to their weak and developing immune system which led them to hospitalize more frequently than adults. Increase in hospitalization rate ultimately results in hospital acquired infections also called as nosocomial infections which ultimately results in prolong length of hospital stay (PLOS).[1,2]

Worldwide nosocomial infections particularly in developing countries where lack of nutrition and low socioeconomic status contribute in an increased hospitalization rates due to preventable diseases. The hospitalization not only affects them financially but it also causes the family to suffer till the child get full recovered. The burden of nosocomial infections vary in different areas depending upon quality of life they are living, cause of hospitalization, and health care facility available at their areas.[3,4]

There are certain factors which may contribute in prolong length of hospital stay. These factors can be hospital acquired infections (upper or lower respiratory tract infections, gastroenteritis, infections of skin or subcutaneous tissues, pneumonia, and urinary tract infections), allergies (Asthma), related to misdiagnosis, parents willing to stay till their child fully recovered, fetal growth retardation or prematurity.[3,5-7]

Currently, in Pakistan there is no such study available at national level or in our area to scientifically provide the data in which the actual burden of factors which contribute in prolong length of hospital stay. Therefore this study will be conducted to scientifically fill the gap and

provide the scientific data regarding risk factors associated with prolonged length f hospital stay in children.

PATIENTS AND METHODS

All the children having age ≥ one year and less than 10 years hospitalized due to any cause of either gender after getting informed and written consent from their parents or guardian were enrolled in our study with the approval of ethical committee. The study was conducted in pediatric ward of Isra University Hospital Hyderabad for duration of 22 months from February 2016 till November 2017.

The children's age were categorized into two main categories to ascertain the actual cause of hospitalization and its relation with superimposed infection and prolong hospital stay. Group A comprises of children between 1 year to 5 year and group B between 6 years to 10 years. The children were diagnosed as nosocomial infection if they get superimposed infection other than the primary cause of admission. Prolong hospital stay will be labeled when duration of hospital stay was exceeded more than 7 days.

DATA COLLECTION AND ANALYSIS

A proforma was designed comprising of basic demographic variables like age and gender and relevant questions like cause of hospitalization, superimposed infection, and duration of hospital stay.

After collection of data analyses were conducted by using Statistical Package for the Social Sciences (SPSS) version 16. Mean and standard deviation were calculated for quantitative variables like age, and duration of hospital stay. Frequency and percentages were computed for qualitative variables like gender, Age Categorization, cause of hospitalization and superimposed infection.

RESULTS

A total of 188 children were admitted during the mentioned period after meeting the inclusion criteria. In group A there were 109 children consisted of 57.97% and remaining group B there were 79 children consisted of 42.02%. The mean age and SD of group A (age >1 year to 5 years) was 2.33 ± 1.09 years and group B (age >6 years to 10 years) was 7.01 ± 2.39 years. There were 99 (52.65%) female children and 89 (47.34%) male children. The overall mean duration of hospital stay with SD was 12.21 ± 3.14. Table-I.

The most common risk factor associated with prolonged duration of hospital stay was delayed presentation of children at hospital (N = 72, 38.29%) followed by children not responding to medical treatment (N = 38, 20.21%), children gets infected with hospital infections (N = 32, 17.02%), delay in diagnosis (N = 18, 9.57%), Parents willing to stay more until their child get fully recovered (N = 17, 9.04%), and lest common risk factor was invasive procedure done on children (N = 11, 5.85%). Figure-1.

Figure-1: shows risk factors associated with prolonged length of hospital stay. Children with Group A (age ≥1 year to 5 years), Females, late seeking of medical attention, children not responding on medical treatment, and those who get infected during hospitalization were significantly associated with prolonged length of hospital stay ($p < 0.05$).

Variables	Mean	Standard Deviation
Age - Years	4.77	3.89
≥1 - 5 Years	2.33	1.09
≥6 - 10 Years	7.01	2.39
Duration of Hospital Stay - Days	9.08	3.14
Age Groups	**Frequency**	**Percentage**
Group A - ≥1 - 5 Years	109	57.97
Group B - ≥6 - 10 Years	79	42.02
Gender		
Male	89	47.34
Female	99	52.65

Table-I. Descriptive statistics of baseline variables (N=188)

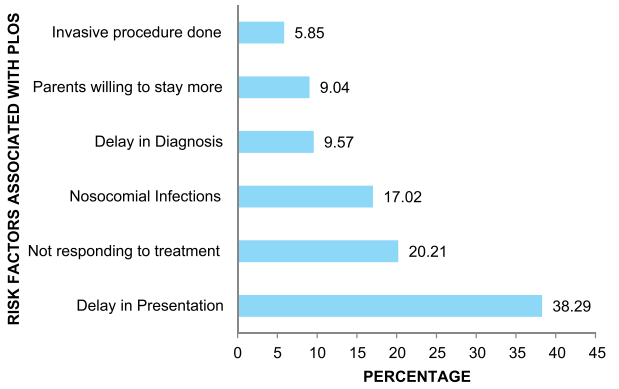

Figure-1. Risk factors of prolong hospital stay

Baseline Data	Mean	PLOS - Mean	P-Value
Age - Years	4.77		
≥1 - 5 Years	2.33	9.22	0.001*
≥6 - 10 Years	7.01	6.12	0.07
Gender	**Frequency**		
Male	89	7.11	0.4
Female	99	11.21	0.01*
Risk Factors	**Frequency**		
Delay in Presentation	72	10.54	0.02*
Not responding to treatment	38	9.02	0.04*
Nosocomial Infections	32	9.01	0.04*
Delay in Diagnosis	18	7.84	0.21
Parents willing to stay more	17	7.09	0.5
Invasive procedure done	11	6.14	0.7
PLOS - Prolonged Length Of Stay			
p- value <0.05 is statistically significant			

Table-II. Comparison of baseline data and risk factors with PLOS (N=188)

DISCUSSION

Our study is the first study to observe the actual burden of factors which contribute in prolong length of hospital stay in children admitted at hospital due to any cause. There are certain factors which may contribute in prolong length of hospital stay. These factors can be hospital acquired infections (upper or lower respiratory tract infections, gastroenteritis, infections of skin or subcutaneous tissues, pneumonia, and urinary tract infections), allergies (Asthma), related to misdiagnosis, parents willing to stay till their child fully recovered, fetal growth retardation or prematurity.[3,8-11]

The observation from our study has shown that most of the children who's length of hospital stay were increased belongs to Group A (1 year to <5 years). Multiple reasons can be associated with early age related to increased in-hospital duration like poor nutritional status among these children as most of our study subjects belongs to poor socioeconomic class along with maternal educational status would have been not more than primary. On the other hand, children less than 5 years old have already weaken immune system and takes time to recover from illness as compared to children whose age more than 5 years and same goes to female gender which were significantly associated with increased length of stay compared with male children.[12-14]

In our study the most significant ($p < 0.05$) risk factors causing prolong length of stay (PLOS) were delayed presentation of children at hospital (N = 72, 38.29%) followed by children not responding to medical treatment (N = 38, 20.21%), and children gets infected with hospital infections (N = 32, 17.02%). Delay in presentation in most often seen in those parents who do not understand how sick is their child is and they mostly use home remedies to treat their children until they get deteriorated hence it all affects children's outcome and ultimately leads to prolonged length of hospital stay this happens due to lack of knowledge when to seek medical attention and what not to use at home to treat their children.[15]

The ultimate sequelae in seeking medical attention late is disease related complications and it takes multiple drugs to treat the primary cause and associated complications which sometimes associated with non-responding on primary drug therapy and needs atypical coverage of the underlying infection causes the children to stay at hospital for a longer duration, as observed in our study.[16]

Those children who were admitted in late stage of disease with complications sometimes require invasive procedures or admission in ICU, these two highly associated with increases susceptibility on nosocomial infections[5,17], which is the third most important causes of prolonged length of hospital stay observed in our study. In a multicentred study conducted in the United States has shown the burden of nosocomial infection in paediatric population is 80,000 which is associated with high number of mortality rates which need to be highlighted and measures should be taken to reduce the burden of nosocomial infections.[18]

CONCLUSION

Scientifically recognition of risk factors associated with PLOS was extremely needed in Pakistan to properly recognize the underlying possible reason and manage accordingly. Younger children with age less than 5 years having female predominance and delayed seeking of medical attention were the most significant risk factors associated with PLOS in our population.

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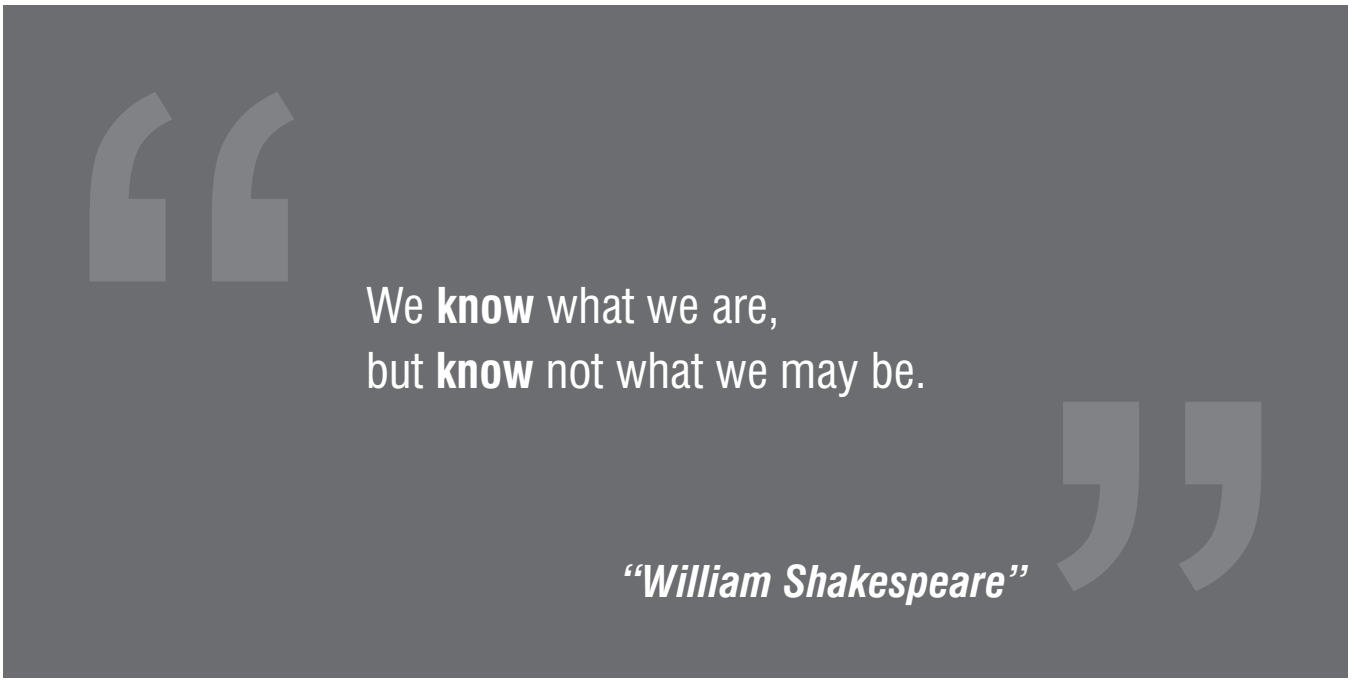

AUTHORSHIP AND CONTRIBUTION DECLARATION

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