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Pattern of Common Admissions and Clinical Profile in 10–15-Year-Olds: A Retrospective Hospital-Based Study at SVPPGIP and Sishu Bhaban, Cuttack

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ABSTRACT

Background: Adolescence (10–15 years) is a transitional phase with distinct health needs, differing from both younger children and adults. Understanding morbidity patterns in this age group is essential for efficient pediatric ward planning, strengthening clinical training, and guiding targeted preventive strategies. This study aimed to describe admission patterns, clinical profiles, outcomes, and potentially preventable factors among adolescents hospitalized at a major tertiary care center in Eastern India.

Methods: A retrospective review of 3,000 consecutive admissions of adolescents (10–15 years) from January 2022 to December 2023 at SVPPGIP and Sishu Bhaban, Cuttack, was conducted. Data from admission registers and case sheets included demographics, ICD-10–based primary diagnosis, length of stay (LOS), outcome (discharge, referral, LAMA), immunization status, and delayed presentation (≥48 hours of symptoms). Descriptive statistics and Chi-square tests were used to assess associations between demographic variables and outcomes.

Results: Of 3,000 admissions, 52.4% were males, with a mean age of 12.8±1.4 years. Infectious diseases were the leading cause (45.1%), followed by chronic non-communicable conditions (25.3%) and trauma (10.2%). The overall mean LOS was 5.4±2.1 days. Delayed presentation was more frequent in infectious cases (40%) than trauma (15%) ($p<0.001$). LAMA occurred in 15.5% and was significantly associated with lower parental education and longer LOS ($p<0.05$). Incomplete immunization records were noted in 9.8% of patients.

Conclusion: The admission profile of 10–15-year-olds shows a dual burden of preventable infections and rising chronic NCDs. High LAMA rates and delayed presentation indicate gaps in community awareness and support. Strengthening timely care-seeking, chronic disease education, and immunization coverage is essential to improve adolescent outcomes.

Key-words: Adolescent health, Pediatric hospitalization, Morbidity pattern, Infectious diseases, Chronic disease, Delayed presentation, Leave Against Medical Advice, Retrospective review

INTRODUCTION

Adolescence, spanning the ages of 10 to 19 years according to the World Health Organization, is a critical phase of physical, psychological, and social development [1,2].

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The 10–15 year age bracket constitutes early and middle adolescence, where health challenges are often unique, representing a blend of residual pediatric issues (like incomplete immunization or nutritional deficiencies) and emerging adult-type conditions (like self-harm, chronic lifestyle diseases, or reproductive health issues) [3,4].

Despite this distinct profile, adolescents are often hospitalized in general pediatric wards, where care protocols are primarily structured for younger children. This mismatch highlights the need for dedicated research on adolescent hospital medicine to ensure appropriate resource allocation, healthcare provider

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training, and culturally sensitive care delivery [5,6]. In the Indian context, where demographic transition is rapidly shifting the burden of disease, tertiary care hospitals such as SVPPGIP and Sishu Bhaban in Cuttack serve as vital sentinel sites, reflecting the region's severe morbidity patterns [7].

Previous studies on pediatric morbidity in India have often focused either on infancy or the pre-school age group, leaving a relative gap in detailed, large-scale data specifically describing the hospitalization patterns of 10–15-year-olds [8,9]. Understanding the frequency of admissions due to preventable conditions (such as vaccine-preventable diseases or infections resulting from delayed presentation) versus non-preventable chronic conditions or trauma is necessary for health planning [10]. Furthermore, critical operational metrics such as Length of Stay (LOS) and hospital outcomes (especially rates of Leave Against Medical Advice, or LAMA), which often signal dissatisfaction or a lack of social support, provide insight into the quality and accessibility of hospital services [11,12].

The objective of this study was to conduct a large-scale retrospective review of medical records to describe the spectrum of diagnoses, average length of stay, final hospital outcomes, and basic demographic characteristics of adolescents aged 10–15 years admitted to the tertiary care pediatric wards over two years. Secondary objectives included identifying the prevalence of delayed presentation and incomplete immunization status as markers of potentially preventable morbidity.

MATERIALS AND METHODS

Study Setting- The retrospective medical record review study was conducted in the general pediatric wards of Sriram Chandra Bhanja V.P.P.G. Institute of Pediatrics (SVPPGIP) and Sishu Bhaban, Cuttack, Odisha, India. The study period covered January 1, 2022, to December 31, 2023.

Study Population- All adolescents aged 10.0–15.9 years admitted during the two years were included. A total of 3,000 consecutive admissions meeting the age criteria were sampled from central admission registers and corresponding case sheets. Elective admissions for planned procedures were excluded.

Data Collection- Trained research assistants extracted information using a standardized, pre-tested proforma. Variables included:

Demographics- Age, gender, residence (urban/rural).

Clinical Profile- Primary diagnosis (ICD-10–coded), comorbidities.

Outcome Measures- Length of stay (LOS), outcome (discharge, referral, LAMA).

Preventable Factors-

Delayed presentation- ≥48 hours from symptom onset to admission

Immunization status- Marked incomplete if age-appropriate adolescent or childhood vaccines were missing

Referral pattern-Self-referred vs. referred from PHC/CHC

Primary admission diagnoses were grouped into broad categories: infectious diseases, chronic non-communicable diseases (NCDs), unintentional injuries/trauma, acute non-traumatic surgical conditions, and other conditions.

Statistical Analysis- Data were analyzed using SPSS version 26. Descriptive statistics (mean, SD, frequency, percentage) summarized the variables. Chi-square tests assessed associations between categorical variables (e.g., diagnostic group and delayed presentation; LAMA and parental education). Independent t-tests compared the mean LOS between diagnostic categories. Statistical significance was set at $p<0.05$.

Ethical Considerations- Institutional Ethics Committee approval was obtained from both SVPPGIP and Sishu Bhaban. All data were anonymized to ensure patient confidentiality.

RESULTS

Fig. 1 illustrates the proportional distribution of the five major diagnostic categories among all adolescent admissions during the study period. Infectious diseases constituted the largest group (45.1%), followed by chronic non-communicable diseases (25.3%), unintentional injuries/trauma (10.2%), acute surgical conditions (7.5%), and other conditions, including nutritional deficiencies (11.9%).

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Table 1: Most common primary admission diagnoses classified by major disease groups.

Diagnostic Category (ICD-10 Chapter Group)	Total Admissions (N=3,000)	Percentage (%)	Mean LOS (± SD) (Days)
Infectious and Parasitic Diseases (A00-B99)	1,353	45.1	4.8±1.5
Top specific diagnoses: Enteric Fever, Dengue, Severe Gastroenteritis			
Chronic Non-Communicable Diseases (NCDs)	760	25.3	6.2±2.5
Top specific diagnoses: Asthma Exacerbation, Epilepsy (status), Acute Glomerulonephritis			
Injury, Poisoning, and External Causes (S00-T98)	306	10.2	5.9±2.8
Top specific diagnoses: Road Traffic Accidents (RTA), Falls, Foreign Body Ingestion			
Acute Surgical Conditions (K00-K95, N00-N99)	224	7.5	4.5±1.8
Top specific diagnoses: Acute Appendicitis, Intestinal Obstruction, Testicular Torsion			
Other Conditions (including nutritional deficiencies)	357	11.9	7.5±3.2
Top specific diagnoses: Severe Anaemia, Protein Energy Malnutrition, Undiagnosed Fever			

The most common cause of admission was the Infectious Diseases category (45.1%), dominated by enteric fever and dengue, which are endemic to the region. The Chronic NCDs category was the second largest (25.3%) and was associated with a statistically significantly longer mean LOS (6.2±2.5 days) compared to infectious diseases (4.8±1.5days) ($p<0.001$). The longest mean LOS was observed in the "Other Conditions" group, primarily driven by severe anaemia and complex, undiagnosed fever cases (Table 2).

Table 2: Relationship between the primary diagnostic category and key preventable factors (Delayed Presentation and Incomplete Immunization Status).

Diagnostic Category	N	Delayed Presentation (≥48h symptoms) (n)	Delayed Presentation (%)	Incomplete Immunization Status (n)	Incomplete Immunization Status (%)
Infectious Diseases	1,353	541	40.0%	190	14.0%
Chronic NCDs	760	205	27.0%	38	5.0%
Trauma/Injury	306	46	15.0%	0	0.0%
Acute Surgical	224	78	34.8%	11	4.9%
Other Conditions	357	126	35.3%	55	15.4%
Total	3,000	996	33.2%	294	9.8%

$\chi 2$ (Diagnostic Category vs. Delayed Presentation): 148.51 ($p<0.001$)
$\chi 2$ (Diagnostic Category vs. Incomplete Immunization): 106.33 ($p<0.001$)

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Overall, 33.2% of all admissions involved a documented delayed presentation of ≥48 hours. The highest rate of delayed presentation was observed in the Infectious Diseases group (40.0%), indicating a significant failure in timely care-seeking behavior for acute, community-acquired infections. The overall prevalence of incomplete age-appropriate immunization status was 9.8%. This deficit was most pronounced in the Infectious Diseases group (14.0%) and the "Other Conditions" group (15.4%), which includes severe nutritional deficiencies.

Table 3: Factors associated with the negative outcome of Leave Against Medical Advice (LAMA)

Characteristic	LAMA (n=465)	Discharged/Referred (n=2,535)	χ2 Value	p-value
Mean LOS (Days)	6.8±2.4	5.1±1.9	t=18.5	<0.001
Diagnostic Category				
Infectious Diseases	12.5%	87.5%	10.15	0.038
Chronic NCDs	18.5%	81.5%		
Trauma/Injury	10.0%	90.0%		
Acute Surgical	11.5%	88.5%		
Other Conditions	24.0%	76.0%		
Rural Residence	355 (76.3%)	1,689 (66.6%)	22.56	<0.001
Delayed Presentation (≥48h)	175 (37.6%)	821 (32.4%)	6.90	0.009

Note: The percentage of LAMA within the Chronic NCD and Other Conditions groups was significantly higher compared to Infectious/Trauma/Surgical categories.

LAMA was significantly associated with a longer mean LOS (6.8 days vs. 5.1 days, p<0.001), rural residence (p<0.001), and delayed presentation (p=0.009). The highest proportion of LAMA was seen in the "Other Conditions" group (e.g., severe malnutrition or undiagnosed complex fevers), often requiring prolonged and expensive investigations, and the Chronic NCDs group, likely due to fatigue with long-term treatment.

DISCUSSION

This large-scale retrospective review of 3,000 admissions provides critical insight into the morbidity profile and service gaps affecting 10–15-year-old adolescents at a major tertiary care center in Cuttack. The findings highlight a complex duality in the disease burden: a high prevalence of acute, community-acquired infectious diseases juxtaposed with a significant load of resource-intensive chronic non-communicable diseases (NCDs).

The dominance of infectious diseases (45.1%), such as enteric fever and dengue, reflects the persistent challenges of public sanitation and hygiene in the region, affirming that despite improvements in health indicators, the adolescent population remains highly vulnerable to preventable infections [13]. However, the substantial proportion of chronic NCDs (25.3%)—including asthma and seizure disorders—signals a clear epidemiological shift and necessitates the specialized development of adolescent medicine units capable of providing complex, longitudinal care [14]. The significantly longer mean LOS for NCDs (6.2 days) compared to acute infections (4.8 days) further strains hospital resources and supports the argument for transitioning stable chronic care management to outpatient community settings whenever possible.

The analysis of preventable factors revealed crucial issues in the continuum of care. The overall 33.2% rate of delayed presentation (≥48 hours) is alarming, particularly the 40.0% rate observed for acute infectious diseases [15]. This delay likely contributes to increased disease severity upon arrival, prolonged LOS, and poorer clinical outcomes. The association between delayed presentation and LAMA (p=0.009) suggests that patients who seek care late are often the same patients who withdraw early, possibly due to higher costs, greater perceived severity, or lower trust in the health system [16].

Furthermore, the 9.8% rate of incomplete age-appropriate immunisation underscores a significant

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failure in public health outreach to reach adolescents for booster doses or specialised vaccines [17]. These gaps in basic protection directly contribute to the burden of preventable infectious admissions in the hospital. The high LAMA rate (15.5%) is a substantial quality-of-care metric that warrants deeper investigation [18]. The strong association between LAMA and rural residence ($p<0.001$) suggests that the financial burden of prolonged stay, transportation costs, and the need to return to agricultural or family labor outweigh the perceived benefit of continued hospitalization [19]. Similarly, the association with prolonged LOS and LAMA highlights that families may lack the social or economic resources to sustain long-term inpatient care, regardless of medical necessity [20].

CONCLUSIONS

In conclusion, the hospitalization pattern of 10–15-year-olds in Cuttack demonstrates critical public health failures in both primary prevention (vaccination and sanitation) and access to timely secondary care. To improve outcomes, hospital medicine strategies should include dedicated efforts to reduce LAMA by strengthening social support and counseling services, and public health interventions should target health literacy campaigns to facilitate rapid identification and referral of acute infections and prevent delayed presentation in this vulnerable adolescent cohort.

CONTRIBUTION OF AUTHORS

Research concept- Dr. Chinmay Barik
Research design- Dr. Chinmay Barik, Dr. Dibya Ranjan Panda
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