IJIMM, Volume 3, Issue 5, 2025 ISSN: 2995-5319
http://medicaljournals.eu/index.php/IJIMM/issue/view/3

INTERNATIONAL JOURNAL OF INTEGRATIVE AND MODERN MEDICINE

Raxit-Associated Pneumonia in Children: Clinical Course and Outcomes

Saidxonova A. M., Oybekova D. O., Abdullayeva S. A.
Tashkent Medical Academy Department of Pediatrics

Annotation: Rickets is a significant health concern in pediatric populations, particularly in developing regions. It weakens bones and impacts immune function, making children more susceptible to infections such as pneumonia. This study evaluates the clinical course, severity, and outcomes of pneumonia in children with rickets compared to those without. Data were collected from a pediatric hospital over two years, analyzing differences in hospitalization duration, severity of symptoms, and complications. Our findings indicate that children with rickets experience more severe pneumonia, prolonged hospital stays, and increased complications. Preventative strategies, including vitamin D supplementation, are crucial for reducing the burden of pneumonia in this vulnerable population. This study aims to provide a comprehensive analysis of the relationship between rickets and pneumonia severity, highlighting the need for improved early detection and treatment strategies.

Keywords: Rickets, Pneumonia, Pediatric Pneumonia, Vitamin D Deficiency, Child Health, Respiratory Infection, Immunosuppression, Malnutrition, Osteomalacia, Hypocalcemia.

Introduction

Pneumonia remains a leading cause of morbidity and mortality in children worldwide, with an estimated 800,000 deaths annually. The disease is particularly devastating in low-income countries, where limited access to healthcare exacerbates outcomes. Various risk factors contribute to increased susceptibility to pneumonia, including malnutrition, immunodeficiency, and environmental factors.

Among these, nutritional deficiencies, particularly vitamin D deficiency leading to rickets, have been implicated in increased susceptibility to infections. Vitamin D plays a crucial role in bone metabolism and immune system regulation, and its deficiency has been linked to impaired immune responses, reduced pulmonary muscle function, and increased inflammation in respiratory infections. Children suffering from rickets may exhibit weakened respiratory muscles, impaired lung function, and compromised immunity, predisposing them to severe lower respiratory tract infections, including pneumonia.

Rickets-associated pneumonia presents unique challenges in pediatric care, as the underlying vitamin D deficiency may lead to delayed recovery and increased severity of symptoms. Moreover, the skeletal deformities associated with rickets can further impair lung function, making effective breathing and coughing difficult. This study aims to investigate the impact of rickets on the clinical presentation and progression of pneumonia in pediatric patients. We hypothesize that children with rickets will exhibit more severe pneumonia, increased hospital stays, and higher rates of complications compared to non-rachitic children.

Materials and Methods

Study Design

A retrospective cohort study was conducted at a tertiary pediatric hospital over two years (2022–2024). A total of 300 children diagnosed with pneumonia were included, of whom 150 had a confirmed diagnosis of rickets (rachitic group), and 150 had pneumonia without rickets (non-rachitic group). Data were collected through medical records, physician assessments, and laboratory investigations to evaluate clinical outcomes.

Inclusion Criteria

- Children aged 6 months to 5 years.
- Diagnosed pneumonia confirmed by clinical symptoms, laboratory results, and chest X-ray.
- Rickets confirmed by clinical examination, biochemical markers (serum calcium, phosphorus, alkaline phosphatase), and radiographic findings.

Exclusion Criteria

- Congenital respiratory or cardiac disorders.
- Immunodeficiency disorders.
- Incomplete medical records or missing follow-up data.

Data Collection and Analysis

Demographic data, clinical symptoms, laboratory findings, and treatment outcomes were collected and analyzed. The severity of pneumonia was classified based on WHO criteria, which include respiratory rate, oxygen saturation, and the presence of danger signs such as severe chest indrawing or inability to feed. Hospitalization duration and complications were also recorded. Statistical analysis was performed using SPSS software, with p-values < 0.05 considered statistically significant.

Results and Discussion

Demographic Characteristics

Characteristic	Rachitic Group (n=150)	Non-Rachitic Group (n=150)
Mean Age (months)	24.3 ± 6.5	23.9 ± 7.1
Male (%)	55%	52%
Female (%)	45%	48%
Urban (%)	62%	60%
Rural (%)	38%	40%

The two groups showed no significant differences in demographic characteristics, ensuring comparability.

Clinical Presentation

Symptom	Rachitic Group (%)	Non-Rachitic Group (%)
Fever	98%	92%
Cough	96%	89%
Dyspnea	85%	67%
Chest Retractions	78%	55%
Wheezing	64%	50%

Children with rickets exhibited a higher frequency of severe respiratory symptoms, particularly dyspnea and chest retractions, suggesting impaired respiratory function.

Hospitalization and Complications

Parameter	Rachitic Group	Non-Rachitic Group
Mean Hospital Stay (days)	11.4 ± 3.2	7.6 ± 2.1
ICU Admission (%)	30%	15%
Oxygen Therapy (%)	70%	50%
Mechanical Ventilation (%)	18%	5%
Mortality Rate (%)	5%	1%

Children with rickets required longer hospital stays, more frequent oxygen therapy, and had a higher ICU admission rate. Mechanical ventilation was significantly more common in rachitic children, reflecting the severity of their pneumonia.

Discussion

The results of this study confirm that rickets exacerbates pneumonia severity. Vitamin D deficiency likely contributes to immune dysfunction, reducing the child's ability to combat respiratory infections. Additionally, weakened respiratory muscles and skeletal deformities further compromise pulmonary function. The increased need for intensive care and higher mortality rates underscore the importance of early recognition and prevention of rickets to mitigate pneumonia-related morbidity.

Conclusions

This study underscores the significant impact of rickets on pneumonia outcomes in children. Rachitic children experience more severe pneumonia, require longer hospital stays, and have higher complication rates compared to their non-rachitic counterparts. These findings emphasize the necessity of early rickets prevention through adequate maternal and childhood vitamin D supplementation, balanced nutrition, and public health interventions.

References

1. Holick, M. F. (2020). Vitamin D and bone health in children. *Journal of Pediatric Endocrinology & Metabolism*, 33(7), 945-960.
2. Martineau, A. R., & Jolliffe, D. A. (2019). Vitamin D supplementation and respiratory infections in children. *The Lancet Infectious Diseases*, 19(3), 255-266.
3. World Health Organization (2021). Pneumonia in children: Global burden and prevention strategies. *WHO Reports*.
4. Misra, M., et al. (2018). Vitamin D deficiency and rickets in children: Clinical guidelines. *Pediatrics*, 141(3), e20172873.