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# Clinical Profile of Acute Bronchiolitis

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**Abstract:- Acute respiratory tract infections are one of the leading causes of death in infants under the age of five worldwide, accounting for 16% of infants under 5 years old who pass away in India. The most frequent lower respiratory tract illness in children under two is acute bronchiolitis, which accounts for two out of every 100 infant hospitalizations. Symptoms include acute inflammation, edema, necrosis of the epithelial cells lining the tiny airways, and increased mucus secretion. The history and clinical examination are the primary bases for diagnosis and severity rating, and the illness is typically self-limiting and lasts 3 to 7 days. Pulse oximetry was used to assess saturation at admission, and the Emergency Department's SpO2 measurement was the greatest predictor of respiratory distress.**

**Demographic information, exam information, and history were gathered and entered into a proforma that had been specially created for the research. Corrected gestational age was taken into account for the infants who were delivered prematurely. This research examined the need and duration of oxygen supplementation IVF requirement in 70 infants admitted with acute bronchiolitis to the paediatric section of the KMC in Manipal. Out of 70 infants, 29 (41.4%) were female and 41 (58.6%) were male. 1 month to 6 months was the most prevalent age range (60%) engaged, and 17 (24%) of the 70 kids had atopy in the family.**

**Males were more likely to be affected than females in the less than six-month-old age category, and there was a spike in instances from August to November. Common symptoms at presentation were cough, feeding difficulty, and iron deficiency anemia.**

***Keywords***:- *Oxygen Saturation, Acute Bronchitis, Emergency Department, Admission, Infants.*

## I. INTRODUCTION

Acute respiratory tract infections are one of the leading causes of death in infants under the age of five worldwide1.Acute respiratory infections are to blame for 16% of infants under 5 years old who pass away in India2.

The most frequent lower respiratory tract illness in children under two is acute bronchiolitis, which also accounts for two out of every 100 infant hospitalizations3.

Acute inflammation, edema, necrosis of the epithelial cells lining the tiny airways, and increased mucus secretion are the hallmarks of bronchiolitis. Rhinitis and cough are frequently the first signs and symptoms, followed by tachypnea, wheezing, the use of auxiliary muscles, and/or nasal flaring3.

- Typically seasonal, with the winter months (India, September to March) having the highest occurrence rate.
- primarily connected to viral illness. (RSV, which is between 50 and 80% prevalent)3.
- The history and clinical examination are the primary bases for diagnosis and severity rating.
- The illness is typically self-limiting and lasts 3 to 7 days.

Among the causes of hospitalisation are:

- Requirement for careful observation
- Oxygen supplementation treatment
- Concern for upcoming respiratory collapse and rehydration

Pulse oximetry was frequently used to observe children who had been admitted with bronchiolitis because it is an effective and non-invasive way to measure oxygen saturation.

In diseases with a V/Q mismatch, such as acute bronchitis and acute exacerbation of asthma5, oxygen saturation is an especially sensitive indicator of disease severity.

The Emergency Department's SpO2 measurement was the greatest predictor of respiratory distress, according to Shaw et al.

SpO2 at admission had the strongest relationship with hospitalisation and length of stay among patients, according to Corneli et al. 7's evaluation of 598 infants.

## II. MATERIALS & METHODS

Demographic information, exam information, and history were gathered and entered into a proforma that had been specially created for the research. Corrected gestational age was taken into account for the infants who were delivered prematurely.

Using a paediatric probe and an awake and quiet infant, a Philips Sure Sign monitor VM8 pulse oximeter was used to assess saturation at admission.

Children were divided into three categories for the study's purposes based on their saturation levels upon admission. Groups A (90%), B (91–95%), and C (>95%).

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Based on clinical characteristics at admission, a clinical severity score (Downe's score8) was determined and classified as mild (score 4), moderate (score 4–7), or severe/imminent failure (score >7).

- Details of the laboratory data and the chest x-ray were acquired.
- Need & duration of oxygen supplementation IVF requirement were the results that were observed.
- length of medical stay and PICU stay.
- Mortality

The S.P.S.S. version 20 programme was used to input the data and analyse it for statistical purposes. Frequency tables were used to present the statistics.

All children between the ages of one month and two years old who are admitted with acute bronchiolitis to the paediatric section of the KMC in Manipal must meet the inclusion criteria.

Exclusion Standards: Cardiopulmonary or Congenital anomaly, recurring pulmonary conditions, developmental and neuromuscular diseases, DAMA.

Examination

- Downe's score and its interpretation

| Score | RR/min | Cyanosis | Air entry | Grunt | Retractions |
|---|---|---|---|---|---|
| 0 | <60 | Nil | Normal | Nil | NIl |
| 1 | 60-80 | In room air | Mild decrease | Audible with Stethoscope | Mild |
| 2 | >80 | In >40%Fio2 | Marked decrease | Audible without Stethoscope | Moderate |

Interpretation: <4 mild ,4-7 moderate,>7 severe/impending failure

- PA :
- CVS :-
- CNS :-

Fig 1 Examination

One of the most significant developments in patient monitoring is pulse oximetry, which is now commonly referred to as the fifth vital sign in paediatrics. Thus, the current research has been conducted5 in this context.

## III. RESULTS & DISCUSSION

- Out of 70 infants, 29 (41.4%) were female and 41 (58.6%) were male.(M:F = 1.4:1)
- 1 month to 6 months is the most prevalent age range (60%) engaged.
- 5 months old on average at debut (IQ R 8,1.3)
- 17 (or 24%) of the 70 kids had atopy in the family.
- In a research by Chalipat SS et al. 11, the M:F ratio was 1.3:1 and the mean age of presentation was 6.9 3.4 months.
- In a research by Saleh et al. (12), 38.6% of cases had family history of atopy.

Nine kids were delivered prematurely (13%) in total. According to a research by Wang et al. 13, 20% of the cases involved prematurity.

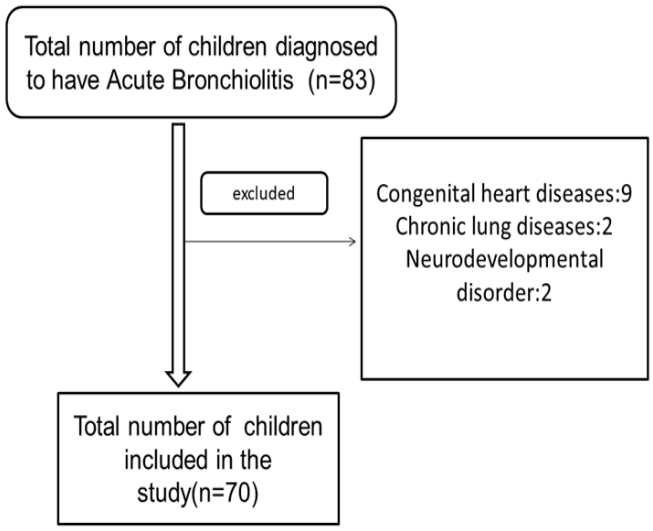


Fig 2 Flow Chart

Table 1 Demographic parameters(n=70)

| Characteristic | n(%) |
|---|---|
| **Gender** | |
| Male | 41(58.6) |
| Female | 29(41.4) |
| **Age** | |
| 1m-6 months | 42(60) |
| 7m- 12 months | 24(34) |
| 13m- 24 months | 4(6) |
| **Birth weight** | |
| ≥2500 grams | 53(76) |
| <2500 grams | 17(24) |
| **Gestational age** | |
| Term | 61(87) |
| Pre-term | 9(13) |
| **Family history of atopy** | |
| Yes | 17(24) |
| No | 53(76) |

- Incidence is more during the months of August to November. Similar observation was found in a study done by Cherian et al in Tamilnadu.

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Fig 3 Seasonal Variation

## Table 2:Clinical presentation

| Symptoms & signs | Number (%) |
|---|---|
| Cough | 70(100) |
| Rhinitis | 66(94) |
| H/O Fever | 60(86) |
| Feeding difficulty | 43 (61) |
| Wheeze | 60(85) |
| Crepitations | 44(63) |
| No Distress<br>Distress:<br>Mild<br>Moderate<br>Severe | 24(34.5)<br><br>27 (38.5)<br>19 (27)<br>0(0) |

All of the kids' main problem was coughing. Wheeze was connected to 70 (100%) in 60 infants (85%).

60% of the children who had h/o temperature and 66 (94%) children who had rhinitis.43 (61%) of the toddlers had feeding issues.

According to a research by Syed Amir Ahmad15, cough was present in 96.5% of cases, wheeze in 75.9%, h/o fever in 36.2%, and feeding issues in 11.3% of cases.

In a study by Iqbal S. 14, wheeze, h/o fever, and poor feeding were all noted in 72%, 64%, and 32% of the cases, respectively.

At presentation, 24 (or 34% of the infants) had a Downes score of 0, and none had a Downes score greater than 6.

Out of 70 kids, 15 (21%) had a spo2 of under 90% at admittance, 14 (20%) had a spo2 of between 91 and 95, and 41 (58.6%) had a spo2 of over 95%.

## Table 3: Distribution of oxygen saturation at admission

| Spo2 | n | % |
|---|---|---|
| <90%(Group A) | 15 | 21.4 |
| 91-95(GroupB) | 14 | 20 |
| >95(GroupC) | 41 | 58.6 |

- Table 4: Lab parameters & Chest x ray findings

| parameter | |
|---|---|
| Total count (cell/mm3)<br>Mean ±SD(67) | <br>14183.5 ±4079 |
| hsCRP(mg/l) (49)<br>Median (IQR) | 4.8(1.1-10) |
| Chest x-ray (38)<br>Normal<br>Hyperinflation<br>Infiltrates<br>Peribronchial cuffing | <br>13(34%)<br>17(45%)<br>5(13%)<br>3(8%) |

## Table 5:Treatment received

| Modality of treatment | |
|---|---|
| Oxygen therapy n(%)<br>Duration of oxygen therapy in hours, mean± SD | 23(33%)<br>62.7( 22.4) |
| IV fluid requirement, n(%)<br>Duration of IV fluid in hours ,mean ± SD | 29(41%)<br>60(26.7), |
| Antibiotics n(%) | 60(85) |
| Nebulized corticosteroidsn(%) | 62(88) |
| Systemic corticosteroids n(%) | 6(8.6) |
| Nebulized Salbutamol+Ipratropium bromide n(%) | 51(73) |
| Saline nebulisations(0.9% saline ) n(%) | 20(28.5) |
| Inhaled epinephrine n(%) | 10(14) |

Days spent in the infirmary (n = 70) and PICU admittance (n=31) averaged 6.32±2.3 and 3.08±1.14 respectively. Range: 1-6 days.

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Table 6: Outcome

| outcome | GROUP A ( n=15) | GROUP B (n=14) | GROUP C (n=41) | p value |
|---|---|---|---|---|
| Severity of illness<br>No distress<br>Mild<br>Moderate | <br>0<br>2<br>13 | <br>3<br>7<br>4 | <br>20<br>18<br>3 | |
| Downe's score, Median(IQR), Range | 4 (5,4)<br>3-6 | 1.5(3.25.0)<br>0-4 | 1(2,0)<br>0-4 | 0.000 |
| ICU admission(n=31) | 15 | 6 | 10 | 0.000 |
| Need for oxygen therapy, n =23 | 15 | 4 | 4 | 0.000 |
| hrs of received in hrs (mean ± SD) | 68.26±22.28 (34-108) | 61±21.54 (42-86) | 44±16.24 (20-54) | 0.155 |
| Need of IVF, n=29 received in hrs(mean ±SD) | 15 | 5 | 9 | 0.000 |
| Length of hospital stay in days (mean+/- SD) | 8.33±2.55 | 6.15± 1.95 | 5.6± 1.9 | 0.00 |

## IV. CONCLUSION

Males were more likely to be affected than females in the less than six-month-old age category.

There was a spike in instances from August to November.

Children who were under 90% oxygen saturation at the time of admission had greater clinical severity, a higher likelihood of needing intensive care, and longer oxygen requirements.

The majority of children suffering from acute brochiolitis were less than 6 months age, with male predominance and monsoon months. Common symptoms at presentation were cough, feeding difficulty, and iron deficiency anaemia. Clinical parameters were recorded, including respiratory and heart rates, wheeze, crackles, intercostal recession, sternal retraction and/or cyanosis. The outcome measure was the need for supplemental oxygen, determined by the independent caring medical team.

Limitations include small sample size and need for population-based research.

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