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Study of Nebulization with Hypertonic Saline and Other Nebulizing Agents with or With Out Antibiotics in Bronchiolitis Patients Aged 2 Months to 2 Years Admitted In RMMCH

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Abstract : *Bronchiolitis is an acute lower respiratory tract infection that occurs in children younger than two years old. It is generally a self-limiting condition usually caused by virus. Based on this a cross-sectional prospective observational study performed in Department of Paediatrics, at RMMCH, Annamalai University, TamilNadu, period of study 6 months; Between November 2015 and April 2016. Totally 81 patients in paediatrics ward with bronchiolitis who satisfy the inclusion and exclusion criteria were enrolled. The objective of this study is to observe the action of nebulizing agents and antibiotics used in treatment of Bronchiolitis, to observe the effective nebulizing agents to get expected outcomes, to observe the mean length of stay in hospital. Our study shows that male patients and patients of age > 2 months -6 months were affected mostly with bronchiolitis. Almost 65% had risk factors due to seasonal changes, environmental changes- dust, and aspiration of milk. The major antibiotics prescribed came under the category of broad spectrum penicillin's, among this amoxicillin-clavulanic acid was the most common antibiotic prescribed for age group > 2 months to 1 year[1]. 62 patients were treated with other nebulizing agents like bronchodilators[2], corticosteroids and decongestant. Among these 40 patients were treated with hypertonic saline with single nebulizing agents. Combination therapy includes hypertonic saline with Dual nebulizing agents- 20 patients and Triple nebulizing agents- 2 patients. The mean length of stay in hospital was 5-6 days.*

Keywords: *Antibiotics, Bronchiolitis, Hypertonic saline, Nebulizing agents, Paediatrics*.

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I. Introduction

Bronchiolitis is an acute lower respiratory tract infection that occurs in children younger than two years old which is characterized by inflammation, edema and necrosis of the small airway epithelium with associated bronchospasm and increased mucous production. Bronchiolitis occurs most frequently in the first year of life and is the commonest cause for hospital admission of infants (Wohl,1978), challenging both economy (Stang 2001) , area and staffing in paediatric departments. The objective of our study is to observe the action of hypertonic saline nebulization with other nebulizing agents and antibiotics used in treatment of Bronchiolitis to observe the mean length of stay in hospital. This study was undertaken to study the effectiveness of nebulization with hypertonic saline and other nebulizing agents with or without antibiotics in bronchiolitis patients aged 2 months to 2 years admitted in RMMCH. So that current trend can be identified which will be useful for the paediatric health professionals in understanding how the available supportive treatment with hypertonic saline nebulization alone or with antibiotics and other nebulizing agents can be best put to use practically.

II. Materials And Methods

This study was conducted in ward of Paediatrics, Rajah Muthiah medical college hospital, Annamalai Nagar, TamilNadu, which is 1260 bedded multi-speciality tertiary care teaching hospital from the period of 2015 to 2016. Required data collected from patient case sheet and recorded in specially designed proforma. Ethically approved.

Inclusion criteria:
Patients admitted in paediatric wards with diagnosis of Bronchiolitis aged 2 months to 2 years of age.

Exclusion criteria:
Patients with co-morbidities such as cardiac disorders.
Patients not willing to participate.
Patient diagnosed with Bronchial pneumonia and other respiratory distress.
Patients with SpO2 <94.
Low birth weight and preterm patients.

III. Results

The results were obtained from 81 patients with bronchiolitis in paediatrics ward, who were enrolled into the study after fulfillment of the selection criteria and after obtaining their consent.

TABLE: 1 Gender Wise Distribution

SL.NO	GENDER	NO OF PATIENTS	% of patients
1	Male	47	58.02
2	Female	34	41.98
3	TOTAL	81	100

FIGURE: 1 Genderwise Distribution

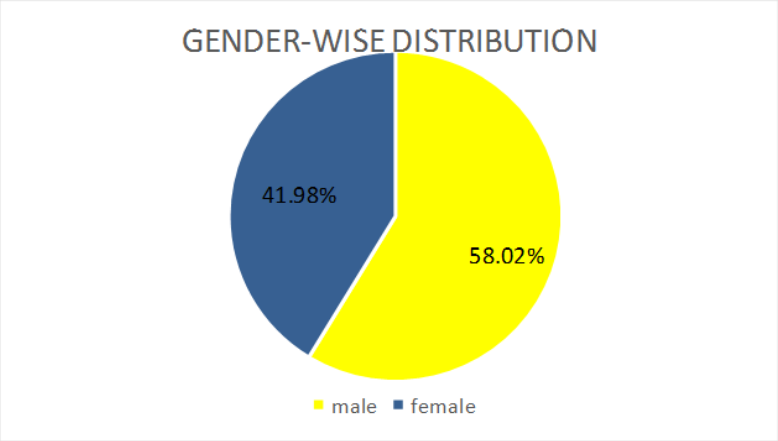

TABLE: 2 Age Wise Distribution

SL.NO	AGE	NUMBER OF PATIENTS	% OF PATIENTS
1	>2 months to 6 months	52	64.19
2	>6 months to 1 year	27	33.33
3	> 1 year to 1.5 years	1	1.23
4	> 1.5 years to 2 years	1	1.23
5	TOTAL	81	100

FIGURE 2: Agewise Distribution

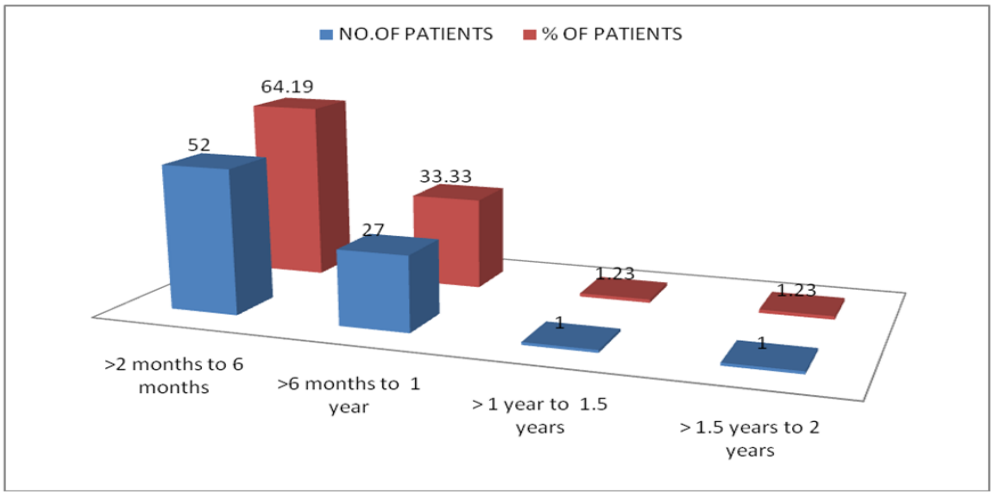

TABLE 3: Agewise Distribution Of Hypertonic Saline Nebulization With And Without Antibiotics

AGE	ONLY HYPERTONIC SALINE	HYPERTONIC SALINE WITH ANTIBIOTIC
>2 months-6months	1	51
>6months-1year	1	26
>1year-1.5years	1	NIL
>1.5years-2years	NIL	1

FIGURE 3: Age Wise Distribution Of Hypertonic Saline Nebulization With And Without Antibiotics

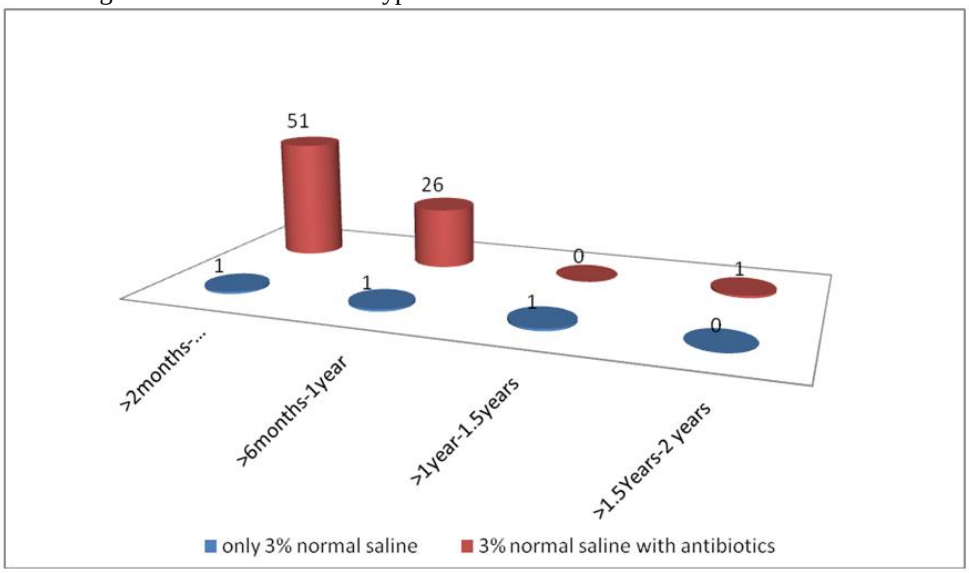

TABLE 4: Age Wise Distribution Of Broad Spectrum Pencillins

AGE	AMOXICILLIN	AMPICILLIN	AMOXICIILIN-CLAVULANIC ACID	AMPICILLIN-CLOXACILLIN
>2M-6M	1	4	29	2
>6M-1Y	3	1	12	1
>1Y-1.5Y	Nil	Nil	Nil	Nil
>1.5Y-2Y	Nil	1	Nil	Nil

TABLE 5: Age Wise Distribution Of Cephalosporins Antibiotics

AGE	CEFOTAXIME	CEFTRIAXONE	CEPHALEXIN
>2-6	2	2	Nil
>6-1	1	Nil	1
>1-1.5	Nil	Nil	Nil
>1.5-2	Nil	Nil	Nil

TABLE 6: Age Wise Distribution In Combination Of Antibiotics

Age	1	2	3	4	5	6
>2-6	1	1	Nil	1	7	2
>6-1	Nil	Nil	1	1	3	Nil
>1-1.5	Nil	Nil	Nil	Nil	Nil	Nil
>1.5-2	Nil	Nil	Nil	Nil	Nil	Nil

Key to chart: 1.AMPICILLIN-GENTAMICIN; 2.AMPICILLIN-CEFOTAXIME; 3.AMPICLOX-CEFOTAXIME; 4.AMOXICLAV-AMIKACIN; 5.CEFOTAXIME-AMIKACIN; 6.CEFTRIAXONE-AMIKACIN

TABLE 7: Antibiotic Therapy Regimen

TYPE OF THERAPY	NO OF PRESCRIPTIONS	% OF PRESCRIPTIONS
Single antibiotic therapy	60	74.07%
Dual antibiotic therapy	17	20.98%
No antibiotics	4	4.93%
TOTAL	81	100

FIGURE 4: Antibiotic Therapy Regimen

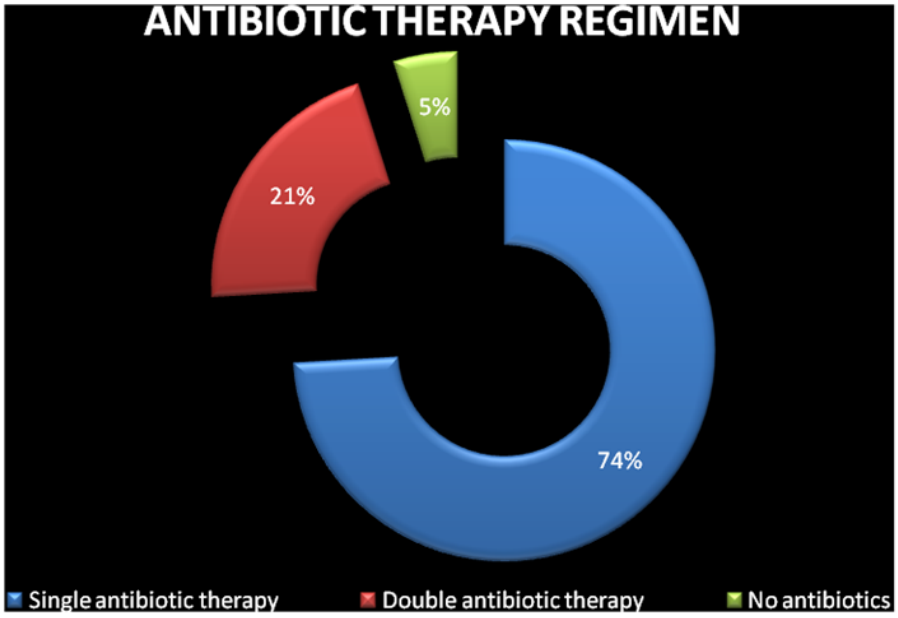

TABLE 8: Age Wise Distribution In Combination Of Other Nebulizing Agents Key To Chart:

AGE	1	2	3	4	5	6	7	8	9
>2-6	1	1	Nil	2	1	1	1	1	2
>6-1	Nil	Nil	1	1	3	2	Nil	Nil	Nil
>1-1.5	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
>1.5-2	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

1. SALBUTAMOL-AMBROXOL; 2.SALBUTAMOL-BUDESONIDE; 3.BUDESONIDE-AMBROXOL;
4.BUDESONIDE-LEVOSALBUTAMOL+IPATROPIUM BROMIDE;
5.LEVOSALBUTAMOL+IPATROPIUMBROMIDE-AMBROXOL;
6.LEVOSALBUTAMOL –AMBROXOL; 7.ADRENALINE-LEVOSALBUTAMOL;
8. ADRENALINE-BUDESONIDE; 9.BUDESONIDE-AMBROXOL-LEVOSALBUTAMOL

TABLE 9: Nebulization Therapy Regimen

TYPE	NO OF PRESCRIPTIONS	% PRESCRIPTIONS
SINGLE THERAPY	40	49.38
DOUBLE THERAPY	20	24.69
TRIPLE THERAPY	2	2.46
ONLY HYPERTONIC SALINE	19	23.45
TOTAL	81	100

FIGURE 5: Nebulization Therapy Regimen

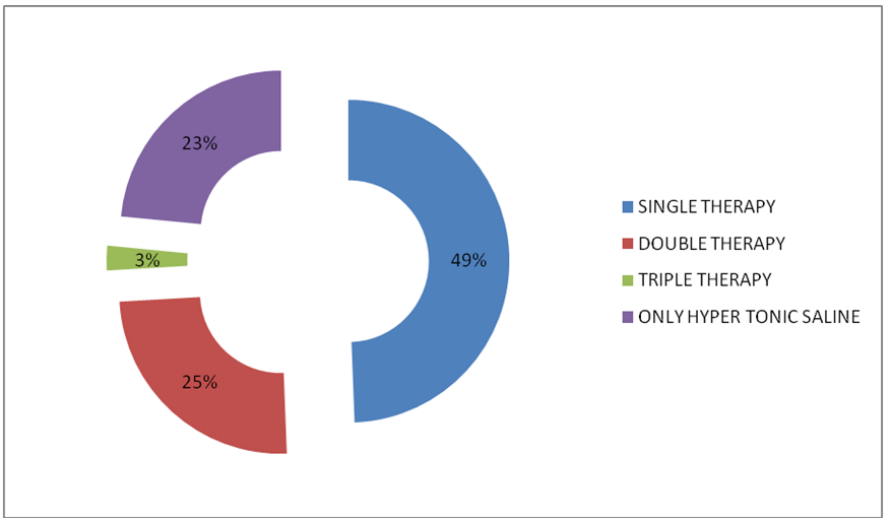

TABLE 10: Age Wise Distribution Of Hypertonic Saline Nebulization With And With Out Other Nebulizing Agents

AGE	ONLY HYPERTONIC SALINE	HYPERTONIC SALINE WITH OTHER NEBULIZING AGENTS
>2 months-6months	15	42
>6months-1year	3	20
>1year-1.5years	1	Nil
>1.5years-2years	NIL	Nil
TOTAL	19	62

FIGURE 6: Age Wise Distribution Of Nebulization With And With Out Other Nebulizing Agents

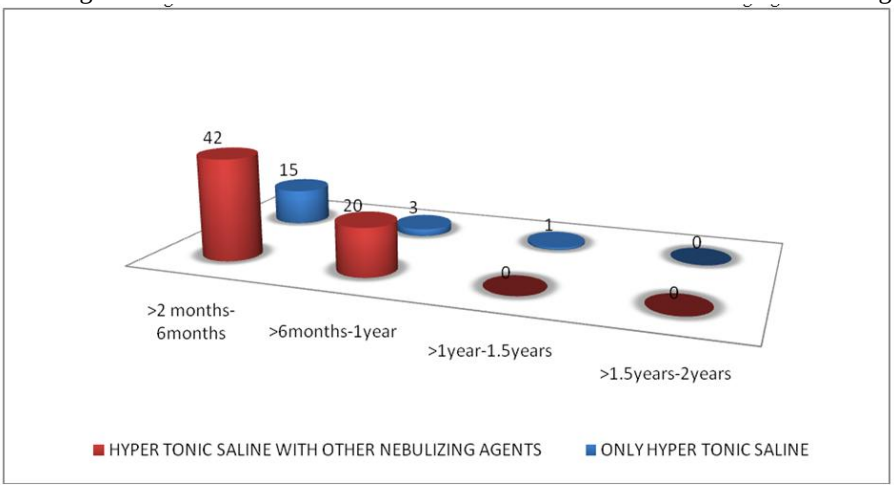

TABLE 11: Risk Factors In Bronchiolitis

PATIENTS WITH RISK FACTORS	PATIENTS WITH LIFESTYLE RISK FACTORS	BOTH
65	20	15

Key to chart:

Risk factors: seasonal changes, environmental changes, aspiration of milk.

Lifestyle risk factors: passive smoking, environmental smoke, transmission via siblings, mother to child infection

FIGURE 7: Distrubtion Of Risk Factors

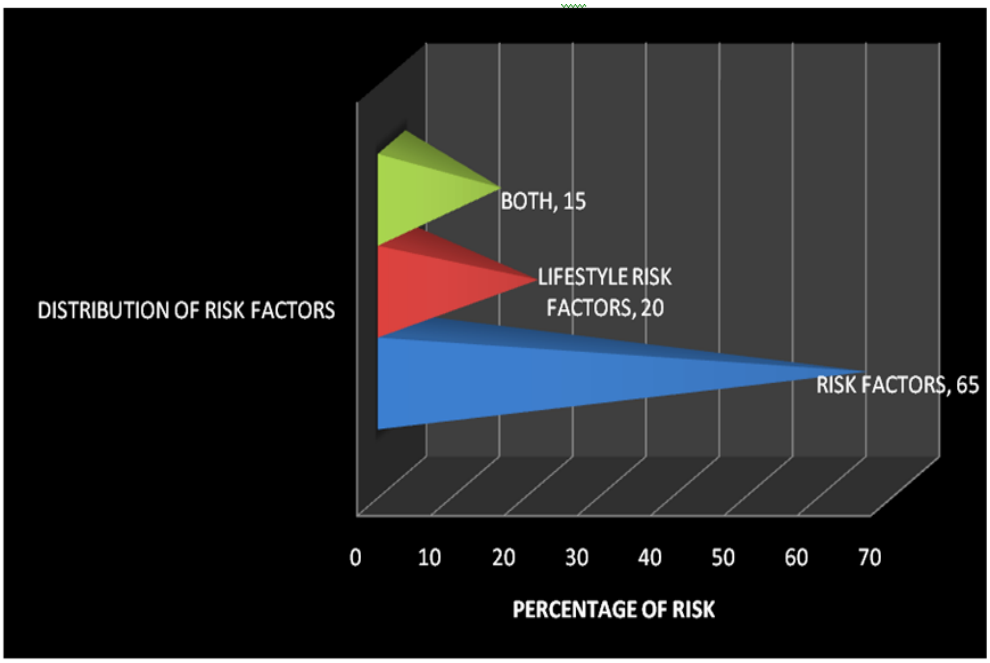

TABLE 12: Mean Length Of Hospital Stay In Days

TREATMENT REGIMEN	NUMBER OF PRESCRIPTIONS	MEAN LENGTH OF HOSPITAL STAY
HYPER TONIC SALINE ONLY	3	5 DAYS
HYPER TONIC SALINE +ANTIBIOTICS	16	5 DAYS
HYPER TONIC SALINE +OTHER NEBULIZING AGENTS	1	5 DAYS
HYPER TONIC SALINE + ANTIBIOTICS+ OTHER NEBULIZING AGENTS	61	6 DAYS

IV. **Conclusion**

The study describes the nebulization with hypertonic saline with or without antibiotics and other nebulizing agents (corticosteroids and bronchodilators) in 81 bronchiolitis patients aged between 2 months to 2 years. The aim of study was to observe the action of nebulization with hypertonic saline and other effective nebulizing agents used in bronchiolitis and to educate patient's mother on the risk factors and preventive steps.

Patient demographics:

A total of 81 patients were enrolled in the study, out of this 47 patients (58.02%) were male and 34 patients (41.98%) were female. Higher prevalence of bronchiolitis was seen in the age group > 2 month – 6 months (64.19%)

Drug use pattern of nebulisation:

All 81 patients enrolled In the study were given nebulization with hypertonic saline (3% NaCl) along with antibiotics and other nebulizing agents

- Among 81 patients 3 patients were treated with hypertonic saline nebulization only.
- 78 patients were treated with hypertonic saline and antibiotics. Majority of the antibiotics were prescribed[1] for age group > 2 months to 6 months and was least prescribed in > 1 year to 2 years. The major antibiotics prescribed came under the category of broad spectrum penicillin's, cephalosporin's and combination antibiotics. Among this amoxicillin-clavulanic acid was the most common antibiotic prescribed for age group > 2 months to 1 year.

  Despite bronchiolitis is a viral cause antibiotics are often prescribed maybe for expecting benefits from anti-inflammatory effects attributed to some antibiotics or to be concerned about secondary bacterial infections (Fitzgerald 2004; Lozano 2002).
- Among 81 patients, 62 patients were treated with other nebulizing agents like bronchodilators, corticosteroids and decongestants and 19 patients were treated with only hypertonic saline (no other nebulizing agents). Among these 40 patients were treated with hypertonic saline with single nebulizing agents.

  Combination therapy includes hypertonic saline with Dual nebulizing agents- 20 patients and triple nebulizing agents- 2 patients

Risk factors of bronchiolitis:

The risk factors of bronchiolitis vary from patient to patient. It can occur due to lifestyle conditions too. In this study 20% of patients had risk due to lifestyle conditions. Lifestyle conditions include transmission via siblings, mother to child infection, passive smoking, environmental smoking etc. and about 65% of patients had risk factors like seasonal changes, environmental changes- dust, aspiration of milk etc.

Mean length of hospital stay:

The mean length of stay in hospital was 5-6 days. There is no significant difference in LOS while administering hypertonic saline only or in combination with antibiotics or other nebulizing agents. This study did not find sufficient evidence to support the use of antibiotics for bronchiolitis, although research may be justified to identify patients who may benefit from antibiotics (Vogel 2003; Kabir 2003; Christakis 2005; Halna 2005; Thorburn 2006).

References

Journal Papers:

[1] Wohl ME, Chernick V. State of the art bronchiolitis. American Review of Respiratory Disease 1978;118:759–81

[2] Stang P, Brandenburg N, Carter B. The economic burden of respiratory syncytial virus-associated bronchiolitis hospitalizations. Arch PediatrAdolesc Med. 2001; 155:95–6.

[3] Fitzgerald DA, Kilham HA. Bronchiolitis: assessment and evidence-based management. Medical Journal of Australia 2004; 180:399–408.
[4] Lozano J, Wang E. Bronchiolitis. Clinical Evidence 2002;8: 291–303.
[5] Vogel AM, Lennon DR, Harding JE, Pinnock RE, Graham DA, Grimwood K, et al. Variations in bronchiolitis management between five New Zealand hospitals: can we do better?. Journal of Paediatric Child Health 2003; 39:40–5.
[6] Kabir M, Haq N, Hoqu M, Ahmed F, Amin R, Hossain A, et al. Evaluation of hospitalised infants and young children with bronchiolitis - a multi-centre study. Mymensingh Medical Journal 2003; 12(2):128–33.
[7] Christakis D, Cowan C, Garrison M, Molteni R, Marcuse E, Zerr D. Variation in inpatient diagnostic testing and management of bronchiolitis. Pediatrics 2005; 115:878–84.
[8] Halna M, Leblond P, Aissi E, Dumonceaux A, Delepoulle F, El Kohen R, et al. Impact of consensus conference on the ambulatory treatment of bronchiolitis in infants. Presse Medicale 2005; 34(4):277–81.
[9] Thorburn K, Harigopal S, Reddy V, Taylor N, van Saene H. High incidence of pulmonary bacterial co-infection in children with severe respiratory syncytial virus bronchiolitis. Thorax 2006;61 (7):611–5.

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