

Incidence of Bronchiolitis in Breast Fed Infants Below 2 Years of Age

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ABSTRACT:

BACKGROUND:

Acute viral bronchiolitis is a common respiratory infectious disease of children.

OBJECTIVE:

To study the relationship between bronchiolitis and breastfeeding in children below 2 years of age.

MATERIAL AND METHODS:

A prospective study was carried out with 100 children aged up to 24 months to evaluate their breastfeeding status as possible risk factors for unfavourable evolution in department of pediatric in AL-Kahdimiya Teaching Hospital during the period from first of October 2008 to the end of March 2009.

RESULTS:

Hundred cases of bronchiolitis were included in this study. Most of them (78%) were below one year. Male children were 70%, female children were 30%. Fifty-four of the children were exclusively breastfeeding. Eighty of the children were admitted to the hospital because of severe attack. The median length of hospital stay was four days and of oxygen-use was three days.

CONCLUSION:

The duration of exclusive breastfeeding was inversely related to the length of oxygen-use and the length of hospital stay. Shorter exclusive breastfeeding was observed in children who were assigned to a pediatric ward or to an intensive care unit. Longer duration of breastfeeding was associated with better clinical outcomes.

KEY WORD: breastfeeding; bronchiolitis, children.

INTRODUCTION :

Acute viral bronchiolitis is a common infectious disease of the lower small airways that affects mostly children aged less than 2 years⁽¹⁾. Approximately 2.2 cases of acute viral bronchiolitis occur per 100 children annually, and 1% of these are hospitalized⁽²⁾. The disease is characterized by a diffuse bronchiolar inflammation induced by viruses (respiratory syncytial virus—responsible for 60-90% of cases, parainfluenza, influenza, rhinovirus, adenovirus, coronavirus, enterovirus and others)^(2,4).

Malnutrition and infection are among the most frequent causes of morbidity and mortality in children, especially in developing countries, where frequency, duration and severity of the infection are related to the nutritional status of the children^(5,6). Breastfeeding provides protection against infection in newborns and infants, and it is associated with low levels of morbidity and mortality in developing countries^(7,9). This effect can substantially decrease when

the child is fed other than maternal milk, including even water or tea. The reason for this is that the child who is not exclusively breast-fed receives less protective factors that exist in mother's milk, besides receiving food or water that are frequently contaminated^(9,11).

MATERIAL AND METHODS:

A prospective study was carried out with previously 100 healthy children aged 0-24 months, with a clinical diagnosis of acute viral bronchiolitis and first episode of wheezing, who were attended or admitted to the emergency ward of pediatric of AL-Kahdemia Teaching Hospital during the period from 1st of October 2008 to the end of the March 2009.

Infants were selected when they arrived at the hospital and were diagnosed by the on-duty emergency paediatrician as having acute viral bronchiolitis based on the symptoms, such as respiratory distress, tachypnea, wheezing, or crackles in pulmonary auscultation, and coughing with a history of upper airway infection with signs and symptoms no longer than seven days.⁽⁴⁾

Prematurely-born (<37 weeks) or low-birth

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weight (<2,500g) infants, those with congenital malformation, inborn errors of metabolism, heart, neurological or liver diseases, other chronic or intercurrent respiratory diseases, and diseases that could influence the nutritional status (pathological gastroesophageal reflux, acute gastroenteritis, diarrhea, or others) were excluded.

If the children met the inclusion criteria and the parents signed the consent term, a form was filled in with clinical evaluation and with data from the patient records. Data on type of breastfeeding, duration of exclusive breastfeeding.

In the classification of types of breastfeeding, the categories defined by WHO were adopted⁽¹²⁾: Exclusive breastfeeding was considered when the child receives only maternal milk, either directly from the breast or extracted and no other liquid or solid, with the exception of drops or syrups of vitamin, mineral, and/or medicine. Predominant breastfeeding referred to the child who received together with maternal milk water or water-based drinks, such as fruit juices and tea.

RESULTS:

For this study, 100 children who met the inclusion criteria were enrolled. Data from these 100 children are presented below.

Table 1. Describes the general characteristics of the children with acute viral bronchiolitis before hospital admission. Of the cases presented, 22% of the hospitalized infants evaluated were three months or less old, 20% were 3-6 months, and 36% were 6-12 months old.

Table 2. Shows the sex distribution, male children 70% outweigh the female in number 30%.

Table 3. Shows the relationship between acute viral bronchiolitis and type of feeding, so patients with acute viral bronchiolitis and who was on breastfed 54%, 30% on bottle feed, and 16% on mixed feeding.

Table 4. Shows the relationship between age and severity of disease, 80% of cases were admitted. All cases improved with time (mean time was 4 days). Interestingly one case from each of the three patients needed intervention and was treated by broad spectrum antibiotic and one patient received steroid. No patient died during treatment.

Table 1: Age distribution for patients with bronchiolitis.

Age in months	No.	percentage
0-3	22	22
3-6	20	20
6-12	36	36
12-18	16	16
18-24	6	6
Total	100	100

No. : number

Table 2: Distribution of Age and sex for patients with bronchiolitis.

Age in months	Male	%	Female	%
0-3	18	18	4	4
3-6	14	14	6	6
6-12	24	24	12	12
12-18	8	8	8	8
18-24	6	6	0	0
Total	70	70	30	30

% : percentage

Table 3 : Distribution of Age and type of feeding for patient with bronchiolitis.

Age in months	Breast	%	Bottle	%	Mixed	%
0-3	16	16	0	0	6	6
3-6	6	6	8	8	6	6
6-12	18	18	16	16	2	2
12-18	14	14	0	0	2	2
18-24	0	0	6	6	0	0
Total	54	54	30	30	16	16

% : percentage

Table 4: Distribution of Age and severity for patients with bronchiolitis.

Age in months	In patient	%	Out patient	%
0-3	22	22	0	0
3-6	12	12	8	8
6-12	28	28	8	8
12-18	12	12	4	4
18-24	6	6	0	0
Total	80	80	20	20

% : percentage

The longer the duration of exclusive breastfeeding was associated with shorter length of hospital stay and oxygen-use.

DISCUSSION:

In the present study , the age at which bronchiolitis occurred was mainly below one year, especially between 6-12 months (36%). seventy percentage of the children were males, most of them below one year of age, possibly because of smaller airways present in boys. These results are similar to other studies ^(12,16).

The type of breastfeeding did not affect the clinical course of previously-healthy infants with acute viral bronchiolitis. On the other hand, the duration of exclusive breastfeeding was inversely related to the length of oxygen-use and the length of hospital stay.

The decision to restrict the inclusion of patients to the first twenty fourth months of life was made because, during this age range acute viral bronchiolitis was the main cause of wheezing and not asthma or reactive airway disease. Furthermore, it is during this age that exclusive breastfeeding is recommended, which makes it possible to compare it with other types of feedings that are considered to be less adequate ^(11,13).

In different studies ^(8,9,17,20), a strong association was evident for the protection of exclusive or predominant breastfeeding against respiratory morbidity as opposed to the introduction of formula milk. In the present study, the longer the duration of exclusive breastfeeding was

associated with shorter length of hospital stay and oxygen-use. Breastfeeding for less than one month increased the incidence of respiratory syncytial virus-associated infection. It is reasonable to speculate that human milk may confer several effects on the development of the respiratory tract and its subsequent ability to fight infections and illnesses. The specific nutritional immunoregulatory and immunomodulatory factors in maternal milk may promote maturation of the infants immune competence ^(19, 20). The optimal duration of exclusive breastfeeding recommended by WHO is six months ^(18,21,23). Given this recommendation, it is important to stress the role of exclusive breastfeeding in the prevention of childhood illnesses and infection in the infants.

In relation to the length of oxygen-use and the length of hospital stay, the duration of exclusive breastfeeding and the presence of virus were determinants in the clinical evolution. These findings suggest that infants with respiratory syncytial virus and those with shorter duration of exclusive breastfeeding present more severe clinical outcomes⁽²⁴⁾.

These results are in disagreement with Muhi study who found that the mean duration of hospitalization was 3.2 days(ranging between 1-8 days) and with Nazar et al who found that the mean duration of hospitalization in those under 6 months was 3.3 days and 2.8 days for those over 6 months

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This study was limited because it evaluated the children in hospital setting i.e. it include only the more severe cases.

CONCLUSION:

The short duration of exclusive breastfeeding was a risk factor for the unfavourable clinical evolution of acute viral bronchiolitis in previously healthy infants. Shorter exclusive breastfeeding was observed in infants who were assigned to the pediatric ward or to an intensive care unit. These findings emphasize the importance of promoting exclusive breastfeeding up to six months of life, not only because of prevention of infectious diseases but also because of the lesser aggressive course of bronchiolitis in breastfed children.

REFERENCES:

1. Denny FW, Clyde WA, Jr. Acute lower respiratory tract infections in nonhospitalized infants. *J Pediatr* 1986;108:635-46.
2. Wright RB, Pomerantz WJ, Luria JW. New approaches to respiratory infections in infants. Bronchiolitis and croup. *Emerg Med Clin North Am* 2002;20:93-114.
3. Ebihara T, Endo R, Kikuta H, Ishiguro N, Ishiko H, Kobayashi K. Comparison of the seroprevalence of human metapneumovirus and human respiratory syncytial virus. *J Med Virol* 2004;72:304-6.
4. Pitrez PM, Stein RT, Stuermer L, Macedo IS, Schmitt VM, Jones MH et al. (Rhinovirus and acute bronchiolitis in young infants). *J Pediatr(Rio J)* 2005;81:417-20.
5. Lesourd BM, Mazari L. Immune responses during recovery from protein- energy malnutrition. *Clin Nutr* 1997;16(Suppl 1):37-46.
6. Organizacao Pan- Americana de Saude- Opas. Atencion integrada a las enfermedades prevalente e la infancia (AIEPI) em las Americas. *Bol Epidemiol* 1998;19:1-9.
7. Effect of breastfeeding on infant and child mortality due to infectious diseases in less developed countries: a pooled analysis. WHO Collaborative Study Team on the Role of breastfeeding on the Prevention of Infant Mortality. *Lancet* 2000;355:451-5.
8. Betran AP, De Onis M, Lauer JA, Villar J. Ecological study of effect of breast feeding on infant mortality in Latin America. *BJM* 2001;323:303-6.
9. Oddy WH, Sly PD, de Klerk NH, Landau LI, Kendall GE, Holt PG et al. Breast feeding and respiratory morbidity in infancy: a birth cohort study. *Arch Dis Child* 2003;88:224-8.
10. Dewey KG, Cohen RJ, Brown KH, Rivera LL. Effects of exclusive breastfeeding for four versus six months on maternal nutritional status and infant motor development: results of two randomized trials in Honduras. *J Nutr* 2001;131:262-7.
11. Giugliani ERJ. Breast feeding in clinical practice. *J Pediatr (Rio J)* 2000;76:238-52.
12. World Health Organization. Indicators for assessing breastfeeding practices. Geneva: World Health Organization. 1991. (WHO/CDC/SER/01.14).
13. Kramer MS, Kakuma R. The optimal duration of exclusive breastfeeding: a systematic review. Geneva: World Health Organization, 2001. 47p. (WHO/NHD/01,08; who/fch/cah/01.23).
14. Tepper RS, Morgan WJ, Cota K, Wright A, Taussig LM. Physiologic growth and development of the lungs during the first year of life. *Am Rev Respi Dis* 1986;134:513-19.
15. Albernaz EP, Menezes AMB, Cesae JA, Victora CG, Barros FC, Halpern R. Risk factors associated with hospitalization for bronchiolitis in the post- neonatal period. *Rev Saude Publica* 2003;37:285-93.
16. Rubin FM, Fischer GB. Clinical and transcutaneous oxygen saturation characteristics in hospitalized infants with acute viral bronchiolitis. *J Pediatr (Rio J)* 2003;79:435-42.
17. Pelletier DL. Potentiating effects of malnutrition on child mortality: epidemiologic evidence and policy implications. *Food Nutr Bull* 1995;16:206-13.
18. Victora CG, Smith PG, Vaughan JP, Nobre LC, Lombardi C, Teixeira AM et al. Evidence for protection by breast -feeding against infant deaths from infections diseases in Brazil. *Lancet* 1987;2:319-22.
19. Victora CG. Breast-feeding, morbidity and mortality. In: Chandra RK, editor. Proceeding of the conference on nutrition and immunology. St. John's, Newfoundland: Biomedical Publisher and Distributors, 1992:63-72.

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20. Bachrach VRG, Shwarz E, Bachrach LR. Breastfeeding and the risk of hospitalization for respiratory disease in infancy. A meta-analysis. *Arch Pediatr Adolesc Med* 2003;157:237-43.
21. Pan American Health Organization. Guiding principles for complementary feeding of the breastfed child. Washington, DC: Pan American Health Organization, 2003:40.
22. World Health Organization. Global strategy for infant and young child feeding. Geneva: World Health Organization, 2003:30.
23. Marques RFSV, Lopez FA, Braga JAP. Growth of exclusively breastfed infants in the first 6 months of life. *J Pediatr (Rio J)* 2004;80:99-105.
24. American Academy of pediatrics. Respiratory syncytial virus. In: Pickering LK, editor. *Red book: 2003. Report of the Committee on Infectious Diseases*. 26th ed. Elk Grove Village, IL: American Academy of Pediatrics, 2003:524.
25. Muhi K. Acute bronchiolitis. *IPMJ* 2002; 2: 77-82.
26. Nazar A, Naji A. Bronchiolitis. Thesis submitted for the fellowship of Iraqi Commission for Medical Specialization in Pediatrics 1993.