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ASSOCIATION OF BRONCHIOLITIS AND BREAST FEEDING IN INFANTS BELOW 6 MONTHS OF AGE AT AL-KHANSAA TEACHING HOSPITAL

***[1]Dr. Mohammed Essmat Ahmed Albudawlah, [2]Dr. Emad Yassin Mohammed Mastoo and [3]Dr. Abduljabbar Abdulrahman Khalaf Essa**

[1]M.B.Ch.B., F.I.B.M.S., C.A.B.M.S. Al-Khansaa Teaching Hospital.
[2]M.B.Ch.B., C.A.B.P. Al-Khansaa Teaching Hospital.
[3]M.B.Ch.B., F.I.B.M.S. Al-Khansaa Teaching Hospital.

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***Corresponding Author: Dr. Mohammed Essmat Ahmed Albudawlah**
M.B.Ch.B., F.I.B.M.S.,C.A.B.M.S. Al-Khansaa Teaching Hospital.

ABSTRACT

Background: Bronchitis, a common respiratory illness in newborns and early children, is caused by various viruses, with risk factors including prematureness, low income, and passive cigarette smoke exposure. Breastfeeding is effective in protecting infants from RTIs, but its long-term effects beyond that age remain unclear. **Aim:** To study the association of the bronchiolitis among the infants below 6 months with different types of feeding. **Patients and Methods:** This hospital-based cross-sectional study at Al-Khansaa Teaching Hospital in Mosul, Iraq between January and February 2022 was examined the impact of feeding patterns on infection contraction in 99 infants with bronchiolitis, examining factors such as age, gender, birth weight, mode of delivery, and prematurity. **Results:** The study analyzed 99 infants diagnosed with bronchiolitis and divided them into breast feeding, artificial milk formula, and mixed feeding. The most common age group was 2-4 months, with male predominance. Breastfed infants and mixed fed infants were at 2-4 months old, while artificial milk formula infants were at 4-6 months. Males were more frequent than females, and most infants were delivered with normal vaginal delivery. Prematurity was found in 2.3%, 7.7%, and 3.4% of infants. **Conclusion:** Breastfeeding type and duration significantly influence bronchiolitis risk in infancy. Exclusive or mixed breastfeeding, compared to infant formula, protects against bronchiolitis, making it an economical and easy-to-implement measure.

KEYWORDS: Artificial Milk Formula, Breast Feeding, Bronchiolitis, Infants, Mixed Feeding.

INTRODUCTION

The most common cause of respiratory illness in newborns and early children globally is bronchiolitis, a viral lower respiratory tract infection that is characterized by acute inflammation, edema, and necrosis of the epithelial cells lining the small airways, as well as increased mucus production.[1]

The majority of bronchiolitis among the infants are brought on by the respiratory syncytial virus (RSV). On the other hand, a similar clinical picture can also be caused by other viruses, such as influenza, rhinovirus, adenovirus, parainfluenza, and human metapneumovirus (HMPV).[1,2]

Between 14% and 44% of young hospitalized children had multiple viral coinfection. Re-infections happen throughout adulthood, although they are usually milder than the initial infection. Primary infection does not provide protective immunity.[3] In Iraq, the infection rate of RSV is common among 46.15% of the infants with high frequencies were noticed among patients live in an urban area and during the winter season from December to February and Spring season that usually extends from March to May.[4] More than one-third of infants suffer from bronchiolitis in their first two years of life, and it is the most frequent reason for hospital admission during that time. Hospitalization rates for all neonates have risen from 1% to 3% over the last 30 years. Growing numbers of hospitalizations have a huge financial burden on the health care system, as well as considerable morbidity and effects on families.[5, 6]

The first wheezing episode associated with bronchiolitis usually occurs before the child reaches 12 months of age. A two-to three-day viral prodromal phase characterized by fever, coughing, and rhinorrhea precedes the course, which then progresses to tachypnea, wheezing, crackling,

and varying degrees of respiratory distress. Indrawing, retractions, nasal flaring, grunting, and belly breathing are some indicators of respiratory distress. There might have been prior contact with someone who had a viral upper respiratory tract infection.[1,7] Prematurity, low income, the presence of siblings in school, passive cigarette smoke exposure, not nursing, and introducing infants to childcare or crèche at an early age are risk factors known to be associated with serious of the disease.[8] The lack of a reliable vaccine to prevent childhood RSV infections and the link between RSV and acute lower respiratory infections (ALRI), which primarily present as pneumonia, the bronchiolitis might clinically cause significant morbidity and mortality as well as a significant burden on healthcare systems around the globe.[9]

In newborns, breastfeeding offers protection against RTIs; however, it is unclear if this protection lasts until later in life. While some studies have indicated that protection ends shortly after weaning, others have discovered that it lasts for at least two years.[10] It is noteworthy that, rather than focusing on specific diseases, many prior studies classified RTIs broadly as upper or lower tract infections[11], and few adequately adjusted for confounding variables or looked into the possibility that sex could modify the effect, as suggested by multiple studies that found girls to be more protected from RTIs.[10, 11]

AIM OF THE STUDY

To study the association of the bronchiolitis among the infants below 6 months with different types of feeding**.**

Patients and Methods

Hospital based cross sectional study design was adopted for this study, in which infants aged less than 12 months who admitted to pediatric wards at Al-Khansaa Teaching Hospital in Mosul, Iraq between January and February 2022 and diagnosed as bronchiolitis were included in the study; the infants with underlying diseases were excluded.

The study sample included 99 infants with bronchiolitis that subdivided into 3 groups based on their feeding patterns; breast milk feeding (BMF), mixed feeding (MF), and artificial milk formula (AMF) groups. We investigated whether age, gender, birth weight, mode of delivery, and prematurity affected the association of feeding patterns on infection contraction. Verbal consent was taken from the accompanied parents before the inclusion in the study. The data was analyzed by SPSS 26.

RESULTS

The study sample included 99 infants below the 6 months of age who were diagnosed with bronchiolitis; the sample was divided according to the types of feeding into: 44 breast feeding, 26 artificial milk formula, and 29 mixed feeding. The difference of the age groups in relation to gender showed no statistically significance (p=0.438) although that the most frequent age group was 2-4 months with male predominance as shown in table (1).

Table 1: Age groups in relation to gender.

Age groups (months)	Gender		Total	p-value*
	Males	Females		
	No. (%)	No. (%)		
< 1month	7(10.3)	2(6.5)	**9**	0.438
1-2 months	13(19.2)	9(29.0)	**22**	
2-4 months	26(38.2)	14(45.1)	**40**	
4-6 months	22(32.3)	6(19.4)	**28**	
Total	68(100.0)	31(100.0)	**99**	
***Fisher Exact test has been used**				

The three types of feeding were compared in relation to age groups, gender, mode of delivery, and prematurity and showed that 43.2% of breast fed infants and 48.3% of mixed fed infants were at 2-4 months of old while the infant with artificial milk formula were at older age group (4-6 months); the difference was statistically significant (p=0.044). Males were more frequent than females in all studied groups but with no significant statistical difference (p=0.183). Moreover, most of the infants in each studied groups were delivered with normal vaginal delivery but the difference in relation to cesarean section was not significant. Prematurity was found in 2.3%, 7.7%, and 3.4% of the BNF, AMF, and MF respectively with no significant difference as shown in Table (2).

Table 2: Comparison of the feeding types concerning the studied variables.

Studied variables		BMF (n=44)	AMF (n=26)	MF (n=29)	p-value
		No. (%)	No. (%)	No. (%)	
Age groups (months)	< 1	1(2.3)	6(23.0)	2(6.9)	**0.044***
	1-2	14(31.8)	3(11.6)	5(17.2)	
	2-4	19(43.2)	7(26.9)	14(48.3)	
	4-6	10(22.7)	10(38.5)	8(27.6)	
Gender	Males	26(59.1)	20(76.9)	22(75.9)	0.183**
	Females	18(40.9)	6(23.1)	7(24.1)	
Mode of delivery	NVD	36(81.8)	18(69.2)	20(69.0)	0.350**
	CS	8(18.2)	8(30.8)	9(31.0)	
Prematurity	Yes	1(2.3)	2(7.7)	1(3.4)	0.687*
	No	43(97.7)	24(92.3)	28(96.6)	
Freeman-Halton Exact test; **Chi square test					

The correlation of the studied groups with the infant weight was demonstrated in Table (3) and showed that the weight was weak and indirectly (r=-0.011) associated with studied groups in that the lower weight was associated with those with mixed feeding but the association was statistically not significant (p=0.917).

Table 3: Spearman Correlation of types of feeding with Infants' weight.

Spearman Correlation of types of feeding with	Value	Asymp. Std. Error[a]	Approx. T[b]	p-value
Infants' weight	-0.011	0.095	-0.104	0.917[c]
a. Not assuming the null hypothesis.				
b. Using the asymptotic standard error assuming the null hypothesis.				
c. Based on normal approximation.				
d. Cannot be computed because there is insufficient memory.				

DISCUSSION

Lower respiratory tract disease incidence and severity are both known to be lowered in breastfeeding mothers. The association between the type of feeding and the length of breastfeeding and bronchiolitis in a child's first year of life, however, is not well understood.[12]

In the current study, no significant difference was found between the age groups between the gender although most of the study sample affected with bronchiolitis was males within the 2-4 months of age. The study conducted by Abduljabbar *et al.*,[13] in Iraq reported that the infection rate of RSV is more common in males 17(65.4%) than females 9(34.6%). Moreover, in Saudia Arabia, Alqahtani *et al.*, study[14] found that the sample distribution is approximately equally distributed between males and females with slight male predominance (54.6% and 45.4%, respectively). While Gómez-Acebo *et al*., study[12] in Spain found that about half of children were females.

Regarding the top age limit for bronchiolitis, which varies from 12 to 24 months, there hasn't been consensus up until now.[15] There is increasing data that suggests limiting the maximum age to six months.[16] Concerning the age of infant, the bronchiolitis was frequently diagnosed. The majority of severe cases that require critical care, for instance, involve infants younger than three months of age. Higher respiratory rates, more chest retractions and less wheezing, more crackles on auscultation, more feeding issues, and more infiltrations on chest radiographs are all linked to younger ages.[17]

The current study evaluate the difference among the three types of feeding among infants below 6 months in relation to age, gender, mode of delivery, and prematurity, only the age showed significant difference in such way that those infants as the age advanced to reach 4-6 months, 22.7% of BMF and 27.6% of MF had bronchiolitis while among the AMF, the rate increased from 23.0% below one months to 38.5% at 4-6 months. There were some age disparities between the BMF, MF, and AMF groups at admission in the study by Jang *et al.*,[18] The infants in the MF group were 4 months old when they were admitted, but the infants in the BMF (75 months) and AMF groups (6 months) were older. Regarding sibling, sex, birth weight, gestational period, and prior medical history, there were no variations seen between the groups. The results of the Gómez-Acebo *et al.*, study[12] demonstrated that both exclusive and mixed breastfeeding lower the frequency of bronchiolitis episodes. When compared to infant formula, exclusive breastfeeding at 4 months decreased the number of bronchiolitis episodes by 41% and mixed feeding by 37%. A decreased risk of unfavorable respiratory outcomes has also been noted in other studies that have evaluated the length of breastfeeding.[19–21] Even when combined with formula milk, breastfeeding decreased the infant's risk of bronchiolitis-related hospitalization in the first year of life, according to Lanari *et al.*,[22] Leung *et*

al.,[23] found no correlation between hospitalization for asthma, bronchitis, or bronchiolitis at age twelve and exclusive or partial breastfeeding for three months or longer, which runs counter to the current findings. Additionally, Nenna *et al.*,[24] observed that breastfeeding for longer than three months was linked to an increased incidence of bronchiolitis in their study of 213 hospitalized infants in Italy.

Concerning the correlation of the infants' weight with the different types of feeding, the current study found that although there was no statistically significant association, the lower weight was found among the infant with MF and the higher weight was associated with BMF. Mól *et al.*,[25] found that there was no difference in body weight or length between any of the three studied groups. Additionally, Jang *et al.*,[18]) discovered that age and weight influence the severity of RSV infection; yet, we were unable to provide an explanation for the lower weight and younger age of the infants in the MF group compared to those in the BMF and AMF groups.

First, the limited sample size is one of the study's limitations. We were unable to investigate the impact of prolonged nursing because, second, the feeding analysis only included the sixth month. Third, because information about breastfeeding is self-reported, there is a chance that we have biased the data because women may have reported in a way that was more in line with social norms than with their real practices.

CONCLUSION

The likelihood of getting one or more bronchiolitis in the first year of life depends on the type of breastfeeding utilized during the first six months of life and the length of breastfeeding. When compared to infant formula alone, breastfeeding and combination feeding help prevent the development of bronchiolitis. Consequently, encouraging exclusive or mixed breastfeeding is a cheap, simple, and efficient way to help avoid infantile bronchiolitis.

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