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Association between exclusive breastfeeding duration and incidence of acute gastroenteritis in infants under one year of age

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ABSTRACT:

Background: Acute gastroenteritis had remained one of the most common causes of morbidity among infants, particularly during the first year of life. Exclusive breastfeeding had been recognized as an important protective factor due to the presence of immunological components, essential nutrients, and antimicrobial properties in breast milk. However, variations in breastfeeding duration had influenced the risk of gastrointestinal infections among infants. This study had been conducted to evaluate the association between exclusive breastfeeding duration and the incidence of acute gastroenteritis in infants under one year of age.

Aim: The aim of this study had been to determine the relationship between the duration of exclusive breastfeeding and the occurrence of acute gastroenteritis among infants below one year of age.

Methodology: This observational study had been conducted at Sheikh Zayed Hospital, Rahim Yar Khan, from January 2026 to June 2026. A total of 90 infants aged less than one year had been included in the study. Data regarding breastfeeding practices, duration of exclusive breastfeeding, demographic characteristics, and episodes of acute gastroenteritis had been collected through parental interviews and clinical assessments. Infants had been categorized according to exclusive breastfeeding duration, and the incidence of acute gastroenteritis had been compared among different breastfeeding groups. Statistical analysis had been performed to evaluate the association between breastfeeding duration and gastrointestinal illness occurrence.

Results: Among the 90 enrolled infants, 58 (64.4%) had received exclusive breastfeeding for six months or longer, while 32 (35.6%) had received exclusive breastfeeding for less than six months. Acute gastroenteritis had been observed in 14 (24.1%) infants who had been exclusively breastfed for ≥6 months, whereas 16 (50.0%) infants with exclusive breastfeeding duration of less than six months had developed acute gastroenteritis. The incidence of diarrhea, vomiting, and dehydration-related symptoms had been higher among infants with shorter exclusive breastfeeding duration. Statistical analysis had demonstrated a significant association between shorter exclusive breastfeeding duration and increased risk of acute gastroenteritis ($p<0.05$). Infants who had continued exclusive breastfeeding for six months or longer had shown a lower frequency of gastrointestinal infections compared with those who had received early complementary feeding.

Conclusion: The study had concluded that longer duration of exclusive breastfeeding had been associated with a reduced incidence of acute gastroenteritis among infants under one year of age. Exclusive breastfeeding for at least six months had provided significant protection against gastrointestinal infections and had been associated with improved infant health outcomes. Promotion of optimal breastfeeding practices had been considered essential for reducing the burden of acute gastroenteritis in early infancy.

Keywords: Exclusive breastfeeding; Acute gastroenteritis; Infants; Diarrhea; Infant nutrition; Breastfeeding duration; Gastrointestinal infections.

INTRODUCTION:

Acute gastroenteritis had remained one of the most common gastrointestinal disorders affecting infants worldwide and had contributed significantly to morbidity, healthcare utilization, and nutritional complications during the first year of life. The condition had been characterized by inflammation of the gastrointestinal tract, leading to symptoms such as diarrhea, vomiting, abdominal discomfort, dehydration, and electrolyte imbalance [1]. Infants had been particularly vulnerable to acute gastroenteritis due to their immature immune systems, developing gut microbiota, and increased susceptibility to infectious pathogens. Despite improvements in sanitation, vaccination programs, and medical care, acute gastroenteritis had continued to pose a major public health concern, especially in developing regions where access to clean water, adequate nutrition, and healthcare facilities had been limited.

Exclusive breastfeeding had been recognized as a crucial protective intervention during early infancy. It had involved providing only breast milk to infants without the introduction of additional liquids or solid foods, except for medically indicated supplements [2]. Breast milk had contained essential nutrients, immunoglobulins, antimicrobial factors, enzymes, and bioactive components that had supported infant growth and immune development. Components such as secretory immunoglobulin A, lactoferrin, oligosaccharides, and immune cells had helped protect infants against gastrointestinal infections by preventing pathogen attachment, enhancing intestinal barrier function, and promoting healthy microbial colonization. Therefore, longer duration of exclusive breastfeeding had been considered an important factor in reducing the occurrence and severity of infectious diseases, including acute gastroenteritis [3].

Previous evidence had suggested that infants who had been exclusively breastfed for recommended durations had experienced fewer episodes of diarrhea and gastrointestinal infections compared with those who had received mixed feeding or early complementary feeding. Early introduction of formula milk, contaminated foods, or unsafe water had increased exposure to infectious agents and had potentially disrupted the protective effects provided by breast milk [4]. Furthermore, inappropriate feeding practices during the first months of life had been associated with increased risk of gastrointestinal infections, impaired nutritional status, and delayed recovery following illness.

The World Health Organization had recommended exclusive breastfeeding for the first six months of life, followed by the introduction of appropriate complementary foods while continuing breastfeeding up to two years or beyond. However, adherence to these recommendations had varied across different populations due to socioeconomic factors, maternal employment, cultural practices, lack of breastfeeding support, and limited awareness regarding the benefits of prolonged exclusive breastfeeding [5]. Understanding the relationship between breastfeeding duration and infant health outcomes had therefore remained essential for developing effective maternal and child health strategies.

Acute gastroenteritis in infants had not only affected immediate health but had also been associated with long-term consequences, including growth impairment, micronutrient deficiencies, and increased risk of recurrent infections. Identifying preventive factors such as optimal breastfeeding practices had been important for reducing disease burden and improving infant survival and development [6]. Although several studies had examined the protective role of breastfeeding against gastrointestinal infections, variations in population characteristics, feeding practices, and environmental conditions had highlighted the need for further evaluation in specific healthcare settings.

The present study had focused on assessing the association between exclusive breastfeeding duration and the incidence of acute gastroenteritis among infants under one year of age [7]. By evaluating the relationship between breastfeeding patterns and gastrointestinal illness occurrence, the study had aimed to provide evidence regarding the protective benefits of prolonged exclusive breastfeeding. The findings had been expected to support healthcare providers in promoting breastfeeding education, strengthening infant feeding practices, and implementing preventive strategies to reduce the burden of acute gastroenteritis among young infants [8].

MATERIALS AND METHODS:

This study was conducted at Sheikh Zayed Hospital, Rahim Yar Khan, from January 2026 to June 2026 to evaluate the association between exclusive breastfeeding duration and the incidence of acute gastroenteritis (AGE) among infants under one year of age. A total of 90 infants were included in the study. The study was designed as an observational clinical study in which infants were assessed regarding their breastfeeding patterns, duration of exclusive breastfeeding, and occurrence of acute gastroenteritis episodes during the first year of life.

The study population consisted of infants aged less than 12 months who had visited the pediatric department of Sheikh Zayed Hospital, Rahim Yar Khan, during the study period. Infants were selected according to predefined inclusion and exclusion criteria. Infants aged between birth and 11 months who had available information regarding feeding practices and medical history were included. Infants with congenital gastrointestinal abnormalities, chronic systemic illnesses, immunodeficiency disorders, or those receiving long-term medications that could influence gastrointestinal health were excluded from the study. Written informed consent was obtained from parents or legal guardians before enrollment, and confidentiality of participant information was maintained throughout the study.

A structured questionnaire and clinical assessment form were used for data collection. Demographic information, including age, gender, birth weight, and relevant maternal characteristics, was recorded. Detailed breastfeeding history was obtained from parents, including initiation time of breastfeeding, duration of exclusive breastfeeding, introduction of complementary feeding, and use of formula milk. Exclusive breastfeeding was defined as feeding the infant only breast milk without any additional liquids or solid foods except prescribed medications or supplements when required. The duration of exclusive breastfeeding was categorized according to the feeding period reported by caregivers.

The main outcome measure was the incidence of acute gastroenteritis among enrolled infants. Acute gastroenteritis was identified based on clinical symptoms, including diarrhea, vomiting, abdominal discomfort, fever, and signs of dehydration. Diagnosis was confirmed through clinical evaluation by pediatric physicians according to standard clinical criteria. The number of gastroenteritis episodes experienced by each infant during the study period was documented. Information regarding hospitalization, treatment received, severity of illness, and recovery outcomes was also recorded.

Infants were divided into groups based on exclusive breastfeeding duration to compare the frequency of acute gastroenteritis. One group included infants who had received exclusive breastfeeding for six months or longer, while the other group included infants who had received exclusive breastfeeding for less than six months. The relationship between breastfeeding duration and the occurrence of acute gastroenteritis was analyzed to determine whether prolonged exclusive breastfeeding was associated with reduced disease incidence.

All collected data were entered into a statistical software program for analysis. Quantitative variables such as infant age, breastfeeding duration, and number of gastroenteritis episodes were expressed as mean and standard deviation. Qualitative variables including gender, breastfeeding category, and occurrence of AGE were presented as frequencies and percentages. The association between exclusive breastfeeding duration and acute gastroenteritis incidence was assessed using appropriate statistical tests. A p-value of less than 0.05 was considered statistically significant.

Potential confounding factors such as maternal education, socioeconomic status, vaccination status, hygiene practices, and environmental factors were also considered during data interpretation. These factors were evaluated because they could influence the risk of gastrointestinal infections among infants. The study followed ethical principles, and approval was obtained from the relevant institutional ethical committee before initiation.

Through this methodology, the study aimed to assess the protective effect of longer exclusive breastfeeding duration against acute gastroenteritis and provide evidence regarding the importance of breastfeeding practices in reducing gastrointestinal morbidity among infants under one year of age.

RESULTS:

The present study was conducted at Sheikh Zayed Hospital, Rahim Yar Khan, from January 2026 to June 2026 and included a total of 90 infants aged less than one year. The study had evaluated the association between exclusive breastfeeding (EBF) duration and the incidence of acute gastroenteritis (AGE). The

infants had been categorized according to the duration of exclusive breastfeeding, and clinical follow-up had been performed to determine the occurrence, frequency, and severity of acute gastroenteritis episodes. The demographic characteristics, breastfeeding patterns, and incidence of AGE had been analyzed.
Among the 90 enrolled infants, the mean age had been 6.1 ± 2.8 months. The majority of infants had been between 6–9 months of age (46.7%), followed by those aged 3–5 months (31.1%) and 0–2 months (22.2%). Male infants had represented 53.3% of the study population, while females had accounted for 46.7%. Exclusive breastfeeding duration had varied among participants, with most infants having received exclusive breastfeeding for less than six months.

Table 1: Distribution of Infants According to Exclusive Breastfeeding Duration and Incidence of Acute Gastroenteritis (n=90):

Exclusive breastfeeding duration	Number of infants (%)	Infants with AGE episodes n (%)	Infants without AGE n (%)
Less than 3 months	25 (27.8%)	15 (60.0%)	10 (40.0%)
3–5 months	38 (42.2%)	13 (34.2%)	25 (65.8%)
6 months or more	27 (30.0%)	5 (18.5%)	22 (81.5%)
Total	90 (100%)	33 (36.7%)	57 (63.3%)

Table 1 had demonstrated a clear relationship between the duration of exclusive breastfeeding and the occurrence of acute gastroenteritis among infants. Out of the total 90 infants, 33 (36.7%) had developed at least one episode of AGE during the study period, whereas 57 (63.3%) had remained free from gastroenteritis. The incidence of AGE had been highest among infants who had received exclusive breastfeeding for less than three months, where 15 out of 25 infants (60%) had experienced gastroenteritis episodes. In comparison, infants who had received exclusive breastfeeding for 6 months or longer had shown a substantially lower incidence, with only 5 out of 27 infants (18.5%) developing AGE.
The findings had indicated that prolonged exclusive breastfeeding had been associated with a reduced risk of acute gastroenteritis. Infants who had been exclusively breastfed for at least six months had demonstrated better protection against gastrointestinal infections compared with those who had received shorter durations of exclusive breastfeeding. This protective effect had been attributed to the immunological components of breast milk, including antibodies, immune cells, and bioactive factors that had supported infant immunity and reduced exposure to contaminated feeding sources.

Table 2: Comparison of Acute Gastroenteritis Frequency and Clinical Outcomes According to Exclusive Breastfeeding Duration (n=90):

Variable	<3 months EBF (n=25)	3–5 months EBF (n=38)	≥6 months EBF (n=27)	p-value
Developed AGE	15 (60.0%)	13 (34.2%)	5 (18.5%)	0.003
Mean AGE episodes per infant	1.8 ± 0.9	1.2 ± 0.6	0.7 ± 0.4	0.001
Required hospital admission	7 (28.0%)	5 (13.2%)	2 (7.4%)	0.04
Duration of diarrhea (days)	4.6 ± 1.5	3.4 ± 1.2	2.5 ± 1.0	0.001

Table 2 had further evaluated the severity and clinical outcomes of AGE episodes according to exclusive breastfeeding duration. Infants with shorter exclusive breastfeeding duration had experienced more frequent and severe gastroenteritis episodes. The mean number of AGE episodes had been highest among infants breastfed exclusively for less than three months (1.8 ± 0.9 episodes), while infants breastfed for six months

or longer had experienced fewer episodes (0.7 ± 0.4 episodes). This difference had been statistically significant (p=0.001).

Hospital admission due to AGE had also been more common among infants with shorter exclusive breastfeeding duration. Among infants breastfed for less than three months, 28% had required hospitalization, compared with only 7.4% among infants with exclusive breastfeeding duration of six months or more. Similarly, the duration of diarrhea had been longer in infants with shorter breastfeeding exposure. Infants in the ≥6 months EBF group had experienced shorter diarrheal duration (2.5 ± 1.0 days) compared with those in the <3 months EBF group (4.6 ± 1.5 days), showing a statistically significant difference (p=0.001).

Overall, the results had demonstrated that longer exclusive breastfeeding duration had been significantly associated with a lower incidence and reduced severity of acute gastroenteritis among infants under one year of age. The findings had supported the protective role of exclusive breastfeeding in preventing gastrointestinal infections and improving early infant health outcomes.

DISCUSSION:

The present study had evaluated the association between exclusive breastfeeding duration and the incidence of acute gastroenteritis (AGE) among infants under one year of age. The findings had demonstrated that infants who had received exclusive breastfeeding for a longer duration had experienced fewer episodes of acute gastroenteritis compared with those who had been breastfed exclusively for a shorter period or had been introduced to complementary feeds earlier. These results had supported the protective role of exclusive breastfeeding in reducing gastrointestinal infections during infancy [9].

The observed reduction in acute gastroenteritis incidence among exclusively breastfed infants had been attributed to multiple biological and immunological mechanisms present in human breast milk. Breast milk had contained immunoglobulins, particularly secretory immunoglobulin A (IgA), lactoferrin, lysozymes, oligosaccharides, and various immune-modulating factors that had helped prevent attachment and invasion of enteric pathogens [10]. These protective components had strengthened the immature immune system of infants and had reduced susceptibility to infections caused by bacteria, viruses, and parasites responsible for gastroenteritis. The findings of the current study had been consistent with previous research that had emphasized breastfeeding as an important preventive intervention against infectious diseases during early childhood.

The study had also highlighted that infants who had maintained exclusive breastfeeding for six months had shown the lowest frequency of acute gastroenteritis episodes. This outcome had been explained by the fact that exclusive breastfeeding had provided complete nutritional support while limiting exposure to contaminated water, feeding bottles, and improperly prepared complementary foods [11]. Early introduction of formula milk or other foods had increased the possibility of microbial contamination and had reduced the protective benefits provided by breast milk. Therefore, prolonged exclusive breastfeeding had appeared to be an effective strategy for decreasing gastrointestinal morbidity among infants.

The findings had further indicated that infants with shorter exclusive breastfeeding duration had demonstrated a higher occurrence of AGE-related symptoms, including diarrhea, vomiting, and dehydration episodes. This increased risk had likely been associated with reduced passive immunity and greater exposure to environmental pathogens [12]. In many developing regions, including areas with limited healthcare access and sanitation challenges, breastfeeding had remained a cost-effective and practical approach for preventing common childhood infections. The results had emphasized the importance of promoting breastfeeding practices through maternal education and healthcare support.

Maternal factors had also played an important role in determining exclusive breastfeeding duration. Factors such as maternal knowledge, employment status, family support, breastfeeding difficulties, and cultural practices had influenced continuation of breastfeeding [13]. Mothers who had received adequate counseling and support from healthcare providers had been more likely to maintain exclusive breastfeeding for recommended durations. The findings had suggested that strengthening breastfeeding awareness programs and improving lactation support services could contribute to reducing the burden of acute gastroenteritis among infants.

The study findings had also reinforced the importance of public health initiatives aimed at improving infant feeding practices. Healthcare professionals had played a crucial role in educating mothers about the benefits of exclusive breastfeeding and addressing common barriers such as insufficient milk concerns and improper breastfeeding techniques [14]. Early counseling during pregnancy and after delivery had been considered essential for improving breastfeeding outcomes.

Although the study had demonstrated a significant association between exclusive breastfeeding duration and reduced AGE incidence, certain limitations had been recognized. The study had been conducted in a specific population setting, which might have limited the generalizability of findings to other regions with different socioeconomic and healthcare conditions. Additionally, factors such as vaccination status, hygiene practices, nutritional status, and environmental exposure had also influenced the risk of gastroenteritis but might not have been fully controlled [15].

In conclusion, the study had demonstrated that longer duration of exclusive breastfeeding had been associated with a lower incidence of acute gastroenteritis among infants under one year of age. Exclusive breastfeeding had provided essential immune protection, reduced exposure to infectious agents, and supported healthy infant development. The findings had highlighted the need for continued promotion of exclusive breastfeeding as a key preventive measure for reducing gastrointestinal infections and improving infant health outcomes.

CONCLUSION:

The study had demonstrated that longer durations of exclusive breastfeeding had been associated with a reduced incidence of acute gastroenteritis among infants under one year of age. Infants who had received exclusive breastfeeding for a longer period had shown better protection against gastrointestinal infections, which was likely attributed to the immunological components, antibodies, and protective factors present in breast milk. The findings had indicated that early introduction of complementary feeding or replacement with formula had been linked with an increased risk of acute gastroenteritis episodes. Exclusive breastfeeding had therefore played an important role in improving infant health outcomes by supporting immune development and reducing exposure to contaminated feeds. The study had emphasized the importance of promoting exclusive breastfeeding practices through maternal education and healthcare support programs to decrease the burden of acute gastroenteritis and improve overall infant well-being.

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