Rule of Prebiotics Comprising Infant Formula in Treatment of Acute Diarrhea

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ABSTRACT

Background Acute diarrhoea is a major contributor to infant morbidity and death. Prebiotics are indigestible dietary components that promote the development of beneficial microorganisms like bifidobacteria.

Method: Two hundred children between the ages of three and twelve months old were randomly assigned to one of two groups for an interventional, randomised investigation of acute diarrhoea. In Group 1, participants were given either prebiotics or a control group that did not receive prebiotics (kept on thier traditional formula).

Results: Once the diarrhoea ceased, the patients were followed up on again. The patient's temperature, the consistency of their stools, and the length of their diarrhoea are monitored throughout follow-up. When compared to the controls, who had diarrhoea for 3.4(1.4) days, the prebiotic considerably shortened that time to 2.7(1.9) days (P value =.0001). (0.04). After 24 hours, there was no significant difference between the prebiotis and control groups in terms of fever reduction, however a difference was observed on days 2 and 3. Mean temperatures for prebiotics were 37.9(0.7), 37.4(0.7), and 37.04(0.2) degrees Celsius, whereas those for controls were 37.8(0.7), 37.4(0.7), and 37.1(0.3) degrees Celsius.

Conclusion: Infants that were given prebiotics had far less diarrhoea and much firmer stools than their control group counterparts.

This study concludes that giving prebiotics to infants can be suggested as a viable strategy for shortening the length of diarrhoea **Aim of study:**.The purpose of this research is to determine whether or not infant formula containing prebiotics is effective in the treatment of acute diarrhoea.

Keywords: acute diarrhea, prebiotic, formula, nondigestible carbohydrates (NDC),

Introduction

Gastrointestinal flora influence health,1 but the composition of flora can be adapted by consuming prebiotics or probiotics.2 Prebiotics are nondigestible substances that stimulate the growth of health-promoting bacteria in the colon, such as bifidobacteria.3-5 They are live microbial feed supplements which improve the intestinal microbial balance. Immediately after birth, bacterial colonisation of the infant's gut begins with bifidobacteria and lactobacilli.These organisms are transferred from the maternal microbial flora in the genital tract and colon during delivery, and also from the environment.4 Gut-associated immune tissue comprise 80% of the immune system, making the composition of intestinal flora an important factor in the immune system. It is believed that the onset of many diseases possibly relates to disruption of the early colonisation of the gut. Preterm infants have delayed colonisation of the gut with beneficial flora by three to four weeks, but colonisation with pathogens occurs earlier and contributes to health problems, such as necrotising enterocolitis (NEC). Breastfed infants are often healthier than formula-fed infants and can fight infections better.9 Breast milk naturally contains prebiotics (oligosaccharides) at a level of 10-12 g/l. These oligosaccharides favour the growth of bifidobacteria in the colon. Exclusively breastfed infants have higher numbers of bifidobacteria and lower numbers of the *Escherichia coli* bacteria, while formula-fed infants harbour equal amounts of these different types of intestinal flora. There are various reasons for this, including the lower content and different composition of proteins in breast milk, the lower phosphorous content, and oligosaccharides and mediators of immune function that are found in human milk. Infant formula lacks these benefits.1 Breastfeeding protects against allergies and infections. This is thought to be partly due to the presence of more bifidobacteria in the gut. Therefore, breast milk stimulates the development of the infant's immune system. Bifidus-dominated flora is protective as it activates the immune system and inhibits invading pathogens that can cause infections. There is also some evidence that infants who suffer from allergies have less bifidobacteria and lactobacilli in their colons. Often, infant formula is supplemented with probiotics and prebiotics to help promote the development of a bifidusdominated flora, with the goal of creating an intestinal flora composition that is similar to that of a breastfed infant.

Important definitions

Probiotic: An oral supplement or a food product that contains a sufficient number of viable microorganisms to alter the microflora of the host and has the potential for beneficial health effects.

Prebiotic: A nondigestible food ingredient that benefits the host by selectively stimulating the favorable growth and/or activity of 1 or more indigenous probiotic bacteria.

Synbiotic: A product that contains both probiotics and prebiotics. Evidence for synergy of a specific prebiotic for a probiotic in the product is not essential. Synbiotics may be separate supplements or may exist in functional foods as food additives.

Postbiotic: A metabolic byproduct generated by a probiotic microorganism that influences the host's biological functions.

Functional food: Any modified food or food ingredient that provides a health benefit beyond that ascribed to any specific nutrient/nutrients it contains. It must remain a food, and it must demonstrate its effect in amounts normally expected to be consumed in the diet. Benefits may include functions relevant to improving health and well-being and/or reduction of risk of disease. Any food that contains probiotics or prebiotics is a functional food. An example of a functional food is live-culture yogurt that contains probiotic bacteria, prebiotics, and other dietary nutrients. Human milk may also be considered a functional food; it contains substantial amounts of oligosaccharides (prebiotics) and may contain some naturally occurring probiotic bacteria (103 of

bifidobacteria per mL of expressed human milk, as reported in 1 study).

What are prebiotics?

Prebiotics are usually in the form of oligosaccharides, which may occur naturally but can also be added as dietary supplements to foods, beverages, and infant formula . Although indigestible by humans, their presence in the digestive system selectively enhances proliferation of certain probiotic bacteria in the colon, especially Bifidobacteria species. Prebiotic oligosaccharides often contain fructose chains with a terminal glucose and typically consist of 10 or fewer sugar molecules. Examples of prebiotic oligosaccharides include fructo-oligosaccharides (FOSs), inulin, galacto-oligosaccharides (GOSs), and soybean oligosaccharides. Inulin is a composite oligosaccharide that contains several FOS molecules.The complex polysaccharides that constitute dietary fiber can also be considered to be prebiotic agents.

Although dietary nucleotides do not fit the exact definition of a prebiotic, they are prebiotic-like agents and have immunomodulating and direct intestinal biological properties. Some infant formulas contain a limited amount of added free nucleotides (7–20 mg/dL). Human milk, on the other hand, contains a substantial but variable amount of oligosaccharides (14 g/L) as well as free nucleotides (up to 20% of nonprotein nitrogen).Some infant-formula manufacturers now add prebiotic oligosaccharides to their products.

Beverages and nutritional supplements marketed for older infants, children, and adults contain oligosaccharides and nucleotide additives in varying amounts.

Mechanism of action

Prebiotics present in human milk, found in food, or supplemented to the diet (e.g., inulintype fructans, GOS) are not hydrolyzed by small intestinal enzymes, thus, they enter the colon and are fermented, resulting in a more acidic luminal pH and an increased concentration of short-chain fatty acids such as lactic, butyric, propionic and acetic acids. This in turn results in increased proliferation of certain commensal bacteria, mainly but not exclusively, bifidobacteria and lactobacilli, which function as probiotics to stimulate intestinal host defenses. Thus, prebiotics may be responsible indirectly for some of the beneficial effects of probiotics. In addition, the produced short-chain fatty acids provide an energy source for colonocytes as well as a stimulus for bacterial-Cepithelial cell 'cross-talk' cellular events, e.g. up-regulation of TLR expression, Several studies have demonstrated the specific effect of prebiotic oligosaccharides in achieving a lower luminal pH and increased concentration of short-chain fatty acids in the colon, as well as an increased concentration of bifidobacteria and lactobacilli; however, long-term studies demonstrating a sustained effect of prebiotics are lacking. In addition, one may deduce that since prebiotics stimulate an increase in bifidobacteria and lactobacilli, the effect of this stimulation on health is similar to that observed with use of probiotics. This assumption, however, needs to be proven in clinical trials. Prebiotics can interact with receptors on immune cells and, thus, provide direct effects that do not require the proliferation of commensal (probiotic) bacteria. Prebiotic carbohydrate properties are not limited to direct and indirect immunomodulation, but also include metabolic functions such as improved mineral absorption and influence on lipid metabolism. Animal studies have shown that inulin-type fructans increase mineral absorption, especially calcium absorption and bone mineralization.

Prebiotic oligosaccharides in infant formula

The use of nondigestible carbohydrates (i.e., oligofructosyl-saccharose and oligogalactosyllactose) in infant formulae and follow-on formulae has been commented on by the ESPGHAN Committee on Nutrition.To date, there are only limited published data on the evaluation of prebiotic substances in dietetic products for infants. No general recommendation on the use of oligosaccharide supplementation in infancy for preventive or therapeutic purposes can be made. During the time of their administration, prebiotic oligosaccharides in dietetic products have the potential to increase the total number of bifidobacteria in feces and to soften stools. The

available data on oligosaccharide mixtures in infant formulae do not demonstrate adverse effects. Validated clinical outcome measures of prebiotic effects in infants should be characterized in future well-designed and carefully conducted RCTs, with relevant inclusion/exclusion criteria and adequate sample sizes. Such trials should also define the optimal quantities, types and intake durations, and safety of different oligosaccharides.

Rule of prebiotics in treatment of acute infectious gastroenteritis

A randomized, double-blind, placebo-controlled multicenter study[42] was conducted to evaluate the efficacy and safety of administering a mixture of nondigestible carbohydrates (NDC), including soy polysaccharide 25%, α-cellulose 9%, gum arabic 19%, FOS 18.5%, inulin 21.5%, and resistant starch 7%, as an adjunct to oral rehydration therapy in the treatment of acute infectious diarrhea in children with mild to moderate dehydration. It was hypothesized that with the incorporation of NDC, some of them (e.g., FOS, GOS and inulin) with prebiotic effects might promote fermentation in the colon, and thus, decrease fecal volume and the duration of the diarrheal illness. One hundred forty-four boys aged 1 to 36 months with diarrhea defined as three or more watery stools per day for >1 day but <5 days with mild or moderate dehydration (World Health Organization criteria) were randomly assigned to receive hypotonic oral rehydration solution (ORS) (Na 60 mmol/L, glucose 111 mmol/ L) with or without a mixture of NDC. ITT analysis did not show a significant difference in mean 48-hour stool volumes. The duration of diarrhea after randomization was similar in both groups (82 ± 39 hours vs. 97 ± 76 hours; p= 0.2). There was no significant difference in the duration of hospital stay, and unscheduled intravenous rehydration was comparable in the two groups. No adverse effects were noted. An explanation for the negative results could originate from the type and the amount of NDC added to the ORS. An average dose of 10 to 15 g per episode in relatively mild diarrhea simply may be insufficient to achieve a shorter duration of diarrhea. Furthermore, it is possible that the timing of the intervention was inappropriate, making the addition of NDC to exclusive oral rehydration therapy an insufficient measure.

Oral rehydration solution with Zinc and Prebiotics in acute diarrhea

An interventional, double blind study was carried out by Federeco University in 2008. The authors randomised 119 Italian children, aged 3–36 months, with acute diarrhoea to receive ORS or 'super ORS' that was fortified with zinc and prebiotics. They did not include a group of children to receive the WHO-recommended treatment of ORS and zinc supplementation of 10 mg (0–5 months) and 20 mg (6–59 months), respectively. The authors observed that a higher proportion of children recovered within 72 h among those receiving the 'super ORS' (72.9%) compared with those receiving standard ORS (50%, p=0.01). Children receiving the 'super ORS' also consumed more ORS in the first 24 h and reported the need for fewer additional medications to treat the episode.[44]

Rule of prebiotics in prevention of antibiotic-associated diarrhea

In contrast to probiotics, there is a paucity of data on the use of prebiotics in the prevention of AAD. The only pediatric double-blind RCT involved 140 children (1 to 2 years of age) who were treated with amoxicillin for acute bronchitis. This study revealed no significant difference in the frequencies of diarrhea in children receiving oligofructose and inulin administered in a milk formula (4.5 g/L) for 21 days after completion of antibiotics compared with placebo (10% vs. 6%, RR 0.6, 95% CI 0.2-1.8). However, prebiotics in a milk formula increased fecal bifidobacteria early after amoxicillin treatment.

Uses and side effects of prebiotics

Although more research is needed, there's encouraging evidence that prebiotics may help:

I. Treat diarrhea, especially following treatment with certain antibiotics
II. Prevent and treat vaginal yeast infections and urinary tract infections
III. Treat irritable bowel syndrome
IV. Reduce bladder cancer recurrence
V. Speed treatment of certain intestinal infections
VI. Prevent and treat eczema in children

VII. Prevent or reduce the severity of colds and flu
VIII. Side effects are rare, and most healthy adults can safely add foods that contain prebiotics and probiotics to their diet.

Probiotic-supplemented formula

The overall health benefit and efficacy of adding probiotics to infant formula remains to be demonstrated in largerandomised clinical trials (RCTs). A clinical report by the American Academy of Paediatrics reviewed the currently known health benefits of probiotic and prebiotic products, including those that are added to commercially available infant formula and other food products for children.The report states that the use of probiotics has been shown to be modestly effective in RCTs in treating acute viral gastroenteritis in healthy children, and preventing antibiotic-associated diarrhoea in healthy children. There is some evidence that probiotics prevent NEC in very low birthweight infants (birthweight between 1 000-1 500 g), but
more studies are needed. The committee on nutrition of the European Society for Paediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN) systematically reviewed published evidence relating to the safety and health effects of the administration of formula that was supplemented with probiotics and/or prebiotics, and compared it to that on unsupplemented formula.The committee concluded that there currently are no safety
concerns regarding feeding probiotic- and/or prebioticsupplemented formula to healthy infants, but there are
insufficient data to recommend the routine use of probioticand/ or prebiotic-supplemented formula. They acknowledge the importance of more research in this field. An effective probiotic must be nonpathogenic and nontoxic and exert a beneficial effect on the host. Moreover, it should be capable of surviving passage through the gastrointestinal tract, particularly the harsh environmental conditions in the human stomach and small intestine.

Probiotic supplementation in infant formula has shown that some strains may persist in the infant gut and lower stool pH.4

Prebiotic- and probiotic-supplemented formula in preterm neonates

There is limited evidence that the supplementation of preterm formula with FOS/GOS is well tolerated, increases
the bifidobacteria stool colony counts, decreases the growth of pathogenic bacteria, improves gastrointestinal
transit time, and softens and acidifies stools to a degree that is similar to that in breastfed infants. Therefore,
supplementation with prebiotics is safe, but routine use is not recommended. Premature infants have inadequate colonisation of the gut for various reasons. It is suspected that the establishment and composition of intestinal flora in preterm infants plays a role in the development of NEC. Theoretically, administration of probiotics to preterm infants should reduce gut pathogens, improve the structure and function of the gut, reduce the need for parenteral nutrition, facilitate enteral nutrition, improve the gut mucosal barrier function, decrease sepsis and antibiotic use, and preventNEC.

Patients And Methods

Design of the study

In the karbala city, researchers conducted an interventional study. In the range of May 2020–April 2021. Two hundred infants, equal numbers of boys and girls, 3-12 months old, made up the total. There were 112 men and 88 girls affected. About 61% of the cases were found in urban regions, whereas 39% were found in rural areas. Children aged 3–12 months old who had a history of acute diarrhoea lasting less than 72 hours were included. The end of diarrhoea is defined in this study as the first occurrence of normal stool following the passage of the patient's final abnormal (loose or watery) stool. The patient's medical history and physical examination results were recorded using a standardised questionnaire.

. Criteria for participation in this study

Inclusion criteria

1.Acute diarrhoea lasting fewer than three days in children aged 3-12 months.
2.Bottle-feeding alone, without exception.

Exclusion criteria

* Infants and toddlers who are exclusively breastfed, or who are breastfed and also given a bottle. The consumption of pre/probiotics within the past three weeks.
• Diarrhea that lasts longer than three days. Patients who experienced severe vomiting for many days throughout the research.
• Undernourishment, as measured by a body mass index (BMI) below the 5th percentile. Serious dehydration is manifested in the patient's physical state.
• Symptoms of a severe acute systemic disease that is also present (meningitis, sepsis, pneumonia). Immunodeficiency disease.
• Preexisting severe chronic illness.

Data collection

I. One of the child's parents gave their permission for the kid to participate in the study. Specific information was collected from each patient's loved ones regarding the following .There should be a list of patients' names.
    - The patients' ages.
II. Patients' places of residence (the centre of cities regarded as urban).
III. •Bladder and bowel movement types (watery, bloody), length, consistency, and regularity.
IV. Meal Formats (breast, bottle, mixed and usual diet).
V. The whole body will be checked out.
VI. Dehydration Level (mild, moderate, and sever).
VII. The axilla was used to take the body temperature (with addition of 5c).
    - Monitor the patient's temperature, the length and consistency of diarrhoea, and the frequency of bowel movements until the diarrhoea is resolved or lasts longer than 7 days.

Investigations

The faeces were examined scientifically. The plastic tube containing the collected stool sample. The parents were given a comprehensive explanation of what would happen during the operation, and it was made sure that the child was capable of comprehending the procedure before the sample was taken. Every instance had at least 0.5g of faeces collected in a sterile container with a clear label. Aldour PHC's Department of Medical Microbiology received and processed samples for rotavirus detection within half an hour of collection. Each stool sample was analysed using a Rotavirus latex agglutination kit that was purchased from a medical supply store (Rota virus test kit manufactured by plasmatic products Ltd, U.K 7.2011). All of the tests were carried out in accordance with the manufacturer's specifications. Colon samples were prepared by mixing 0.2ml/0.2g of faeces with 2.0 ml of dilution buffer in centrifuge tubes. To incubate the mixture, the tubes were left out at room temperature for 5-10 minutes after being thoroughly mixed by vortex. After centrifugation at 1000 g for 10 minutes, the supernatant was collected from the samples. In order to check for agglutination, 50 l of supernatant from each sample was combined with rotavirus latex reagent, and the slide was rotated at 60-80 rpm for 2 minutes. A strong agglutination indicated the presence of rotavirus. All test batches went through a series of positive and negative controls. pH was also measured in the stool sample. Half a millilitre of poop is required, after which a strip of nitrazinepaper is dipped in the sample and compared to a colour scale. An acidic sample has a pH lower than 5.5.

Statistical analysis

Data was recorded on A3 paper (master table) before being transferred to computer for tabulation and descriptive presentation of questionnaire results. System No.17 for the SPSS Manager. The statistical significance of the various factors was determined through a Chi-square (X2) test performed on the collected data. The sample was calculated and described using counts and percentages. A p-value less than 0.05 was considered statistically significant, while a p-value greater than 0.05 was not.

Result

The total number of cases was 200 infants , (112) were males (56%) and (88) were females (44%) as , with male to female ratio 1.2:1. .Analysis of the residency of the children aged 3-12 months revealed that (61%) from urban

area and (39%) children from rural area.Distribution of the study sample in regard to their age groups reveled that most age group affected for both groups is 6-9 months. While 3-6 months is the least

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Table 1: Effect of prebiotic on duration of diarrhea.

Cases	No. of cases	Duration of diarrhea In days (mean ±SD)	% of Total
Taken prebiotics	100	2.7(±1.9)	50%
Control	100	3.4(±1.4)	50%
Total	200	3.06(±1.7)	100%

***P* value = 0.04 < 0.05 (significant)**

Table (2) effect of prebiotics on cure rate of diarrhea (in days) within the 1st 3 days after intervention.

Cases	No. of cases cure within 3days		No. of cases not cure within 3days			
	No	%	No	%	No	%
Taken prebiotics	64	34%	36	16%	100	50%
Control	42	19%	58	31%	100	50%
Total	106	53%	94	47%	200	100%

***X*² (chi-square) = 9.03 , df =1 , *P* value = 0.003 < 0.05 (significant)**

Table (3) effect of prebiotics on improvement of consistency of diarrhea within the 1st 3 days after intervention.

Cases	No. of cases improve consistency within 3days		No. of cases not improve consistency within 3days		Total	
	No	%	No	%	No	%
Taken prebiotics	70	38%	30	12%	100	50%

Control	**36**	**16%**	**64**	**34%**	**100**	**50%**
Total	106	**54%**	94	**46%**	200	**100%**

***X*² (chi-square) = 19.3 , df =1 , *P* value = 0.0001 < 0.05 (significant)**

Table (4) effect of prebiotics taken on improvement of fever within the 1st 3 days after intervention..

Cases	No. of cases	Fever in day 1 (mean ±SD)	Fever in day 2 (mean ±SD)	Fever in day 3 (mean ±SD)	% of Total
Taken prebiotics	100	37.9 ℃ (±0.7)	37.4 ℃ (±0.7)	37.04 ℃ (±0.2)	50%
Control	100	37.8 ℃ (±0.7)	37.4 ℃ (±0.7)	37.1 ℃ (±0.3)	50%
Total	200	37.8 ℃ (±0.7)	37.4 ℃ (±0.6)	37.08 ℃ (±0.2)	100 %
P value		0.5 >0.05 non significant	0.7 >0.05 non significant	0.1 >0.05 non significant	

Table (5) effect of prebiotics on improvement of stool frequency of prebiotics on improvement of fever.

Cases	No. of cases	Frequency in day 1 (mean ±SD)	Frequency in day 2 (mean ±SD)	Frequency in day 3 (mean ±SD)	% of Total
Taken prebiotics	100	9.8(±3.7)	6.5(±4.1)	3.9(±2.2)	50%
Control	100	8.8(±2.9)	8.1(±3.2)	5.4(±2.6)	50%
Total	200	9.3(±3.3)	7.3(±3.7)	4.7(±2.5)	100 %
P value		0.1 0.05 non significant	0.03 < 0.05 significant	0.003 < 0.05 significant	

Discussion

Two hundred children were included in this investigation of prebiotics and acute diarrhoea (50 %in experimental and 50 %in control groups). Three-to-twelve-month-old infants of both sexes were the intended victims. There is a mix of city and country living. The study's primary health care centre patients were likely representative of the general population, suggesting that the majority of cases originated in urban settings. The male to female ratio was 1.2 to 1, indicating a modest bias toward men. Consistent with research conducted at Iraq's Al-Nahrain University by Nasheit A. Nasheit. Rekan Sulaiman discovered more positive outcomes. Karbala hospital has a male majority (66.6%) and a female minority (33.2%). As well, it corroborated research conducted by Mona J. Ali. The peak age for diarrhoea, according to the distribution of all cases across age groups, is between 6-9 months. This might be owing to the fact that children's immune systems are still developing, making them more susceptible to gastroenteritis when solid foods are first introduced. That made sense, according to research by Muna Ali and Nasheit A. Nasheit. The use of prebiotics considerably shortened the time period during which diarrhoea was experienced, in comparison to the use of conventional formula. Diarrhea lasted an average of (2.7) days in individuals who took prebiotics. It took the regular formula group (3.4) days to recover. It was different by (16.8) hours (P = 0.04). There was some evidence that prebiotics helped cure acute gastroenteritis in babies (3-12 months old). There were no blatantly negative reactions to prebiotics. Considering how novel the issue of prebiotics as a rule in the treatment of severe diarrhoea is, there are just a handful of studies against which I can benchmark my own. There was concordance between these findings and a 2008 research by Annalisa Passariello and Terrin G et al. from the Department of Pediatrics at the University of Naples Federico II in Naples, Italy. Children (3–36 months old) with acute diarrhoea were randomly allocated to receive either the traditional hypotonic ORS (group 1) or a novel hypotonic ORS formulation (group 2), both of which contained electrolyte replacement solutions. prebiotics (group 2). (group 2). The primary endpoint was the percentage of patients whose diarrhoea stopped within 72 hours. Group 2 had a greater percentage of patients whose diarrhoea cleared up by the 72-hour mark (50% vs 72.9%, P =.010). The results demonstrate that giving children prebiotics along with their ORS helps reduce the severity and length of their diarrhoea. Acute diarrhoea can be treated well with a combination of oral rehydration salts (ORT) and prebiotics, as demonstrated by the work of Jessica Hersman. Both of these comparisons have P values of less than 0.001; however, the difference is larger for the latter at 78.5 hours than for the former at 115.5 hours. Michael de Vrese and Philippe R. Marteau's findings were contradicted by my own. While inulin, oligofructose, and galactooligosaccharides have all been shown to have beneficial effects on intestinal microflora, and animal experiments have shown some encouraging results, the authors of this study concluded that there is not yet enough evidence to recommend prebiotics for the treatment or prevention of diarrhoea. In a study with 200 patients, 53% were declared cured following 3 days of treatment, while 47% required more time. The majority of people who take prebiotics have improvement in diarrhoea after three days (34% vs. 19% for controls). Both Annalisa Passariello A and Terrin et al concurred with this finding (72.9%) vs (50.0%). In order to reduce the likelihood of dehydration, hospitalisation, and malnutrition, treating diarrhoea as soon as possible is crucial. It's cheaper and reduces missed work days for parents. Diarrhea is characterised by a number of key features, one of which is loose stools. Stools were classified in this study as either liquid, semi-liquid, or well-formed based on the parents' reports. We calculated the results of the first three days of the trial using data from a prior study and we discovered that prebiotics improve stool consistency. The data demonstrates that, compared to the controls, twice as many patients saw an improvement in stool consistency. There was agreement between these findings and the research conducted by M.D. Jessica Hersman . She figured

that a sign of recovery would be normal bowel movements. The day after commencing treatment, there was a statistically significant improvement in stool consistency as measured by the 1–4 grading system (p0.001). People who took prebiotics returned to normal stool consistency more quickly than the controls, her research showed. Perhaps this is because prebiotics promote the development of beneficial bacteria in the stomach that speed the process of curing diarrhoea. No studies were discovered throughout our search that contradicted my findings. That might be because not many studies on this topic have been conducted or because they have not been made public. Our research shows that prebiotics have a beneficial effect on stool frequency within the first three days of intervention. According to research, the danger of being dehydrated is greatest around this time. The uptick in bifidobacteria levels after introducing a milk formula fortified with prebiotics suggests that this strategy may help restore the gut microbiota's natural balance. Improvements in diarrhoea have been the subject of several research, however the frequency per 24 hours has not been employed as a metric in most of them However, the use of total stool production, which is more sensitive, was not possible in our investigation. In this case, my findings matched those of the study by Passariello A. and Terrin G. There was a statistically significant difference in the number of daily outputs between groups 1 (controls) and 2 (prebiotics) after 24 hours (4.5; 95 percent confidence interval 3.89-5.11 versus 5.9; 95 percent confidence interval P =.002) and after 48 hours (4.5; 95 percent confidence interval 3.89-5.11 versus 5.9; 95 percent P =.002). The prevalence of human rota virus was 28% among the patients we examined. While 72 out of 74 instances (72%) tested negative. This is a worse outcome than what Dr. Ali Jerin Hasson found. This discrepancy may be due to differences in sample size and patient age; in our study, patients were no older than a year, but in the other study, they were older than two. This was also lower than the results of research conducted in Russia (34.9%), Turkey (39.5%), and Australia (40%). We employed a latex agglutination test to identify human rotavirus, while other studies have used an ELISA approach, and their sample ranges included both inpatients and outpatients, thus the discrepancy might be due to the method used to detect the virus. One possible explanation for the discrepancy across studies is the large gap between the HRV detection rates of inpatients and those of outpatients. Prebiotics do not seem to play a role in rotavirus-caused diarrhoea, according to our research. An American Academy of Pediatrics (AAP) report summarises the current understanding of the health benefits of probiotics and prebiotics, including those added to infant formula and other food products for children. This finding is consistent with the findings of a report by Laurie Barclay, MD, published on December 2, 2010. In the end, he decided that there was some evidence to back up the use of probiotics for treating rotavirus gastroenteritis and infantile colic in newborns, but not prebiotics. Because of the small sample size, we cannot draw any firm conclusions on the efficacy of prebiotics in treating acute gastroenteritis. Another unreliable and potentially inaccurate approach for identifying human rotavirus is the latex method. [What we know about prebiotics and how they affect stool pH in cases of severe diarrhoea .Most of the patients in our trial who had a stool ph that was too low to be considered normal did not improve during the first three days of treatment. Numerous reports have emphasised the need of measuring stool pH for diagnosing severe diarrhoea. A study conducted at Erbil's Pediatrics Teaching Hospital confirmed such findings. Intolerance to complex carbohydrate sugars (especially lactose) is common in both acute and chronic diarrhoea. This condition almost often includes buttock excoriation. Babies who were bottle-fed or breastfed were more likely to get the illness. There was agreement between this study and the one conducted by Szajewska et al. In a study of 108 children aged 3 to 36 months with acute diarrhoea and dehydration when their diarrhoea persisted for more than 24 hours after the commencement of ORT, children with a pH > 5.5 voided more stools and had a greater ORT consumption in the first 24 hours. We found no evidence that prebiotics helped with

acidic pH acute diarrhoea. The effects of prebiotics on each variety of bowel movement are identical, regardless of the pH of the resulting stool. Consistent with a similar study conducted on adults by Levri KM. et al . They looked for randomised controlled trials measuring breath hydrogen between 1966 and 2002. Databases Overall, the reviewers found that prebiotic supplementation did not improve lactose intolerance symptoms in adults. There is some data that shows particular concentrations and formulations are useful. More research is needed to define this possible therapeutic link using particular strains and doses in clinical studies. We conclude that this finding is due to either the lack of a general guideline for the use of prebiotics in the treatment of lactose intolerance or the fact that the sample size was too small to draw any firm conclusions. People in Group 1 who started taking prebiotics had their fevers decrease more quickly than the controls did during the first three days. The same explanation given in that presumably explains this observation. This is for the same reason that higher levels of beneficial bifidobacteria caused by a prebiotic have a beneficial impact when used to treat diarrhoea. We only take temperatures once a day, which may not be during the fever's peak in cases of intermittent illness, thus our results may not be completely reliable. No standardised antipyretic treatment or drug was designed, thus parents employed a variety of methods for treating fever.

Conclusion and recommendations

The prebiotics and probiotics that are now being added to commercial infant formula are classified as GRAS (generally regarded as safe) by the FDA. The addition of probiotics to powdered infant formula
has not been demonstrated to be harmful to healthy term infants. However, evidence of clinical efficacy regarding
their addition is insufficient to recommend the routine use of such formula. The ESPGHAN committee on nutrition has concluded that at present, there are insufficient data to recommend the routine use of probiotic- and/or prebiotic-supplemented formula. Yet the administration of probiotic (single or in combination) supplementation to infant or follow-on formula, and given beyond early infancy, may be associated with some clinical benefits. These include a reduction in the risk of nonspecific gastrointestinal infections, a reduced risk of antibiotic use and a lower frequency of colic or irritability. Reviewed studies have varied with regard to methodological quality, the specific strains studied, the duration of the interventions and the doses used.

The FAO supports the use of prebiotics in infant formula for infants aged five months and older, as they have a more mature immune system. Products containing prebiotics or probiotics are not recommended for immunocompromised infants, ill preterm neonates and children with indwelling medical devices.

1.Despite probiotics appears to be a promising treatment for the treatment of FGDIs subtypes, the overall quality
and quantity of evidences are relatively weak and therefore more studies with robust design are needed to
evaluate efficacy of either mono- or multistrain supplementation, and the most appropriate dose.

2.The effects of probiotic administration for prevention/ treatment of allergic diseases are still so controversial that no firm recommendation can be made at this stage. Differences in strain specificity, timing of administration, and length of the therapy are all contributing to diversify the metanalysis conclusions

3.Probiotic supplementation shows an overall advantage in preventing the incidence of NEC and gut-associated sepsis
and decreasing mortality in preterm infants.

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