

Epidemiological Study Of Acute Diarrhea In Breast Fed Infants

Dr. Iman Jabbar Kadhum: MBChB, DCM, MSc Microbiology Kufa University, College of Medicine, Community Medicine Department

خلاصة البحث

لغرض دراسة أسباب الأسهال الحاد لدى الأطفال المعتمدين على الرضاعة الطبيعية خلال السنة الأولى من العمر . تم جمع ٧٠ رضيع عشوائيا من ردهات الأطفال والطوارئ في مستشفى الولادة والأطفال في النجف للفترة من الأول من اب ٢٠٠٩ ولغاية الأول من كانون الثاني ٢٠١٠، تم فحص الرضع سريريا مع إجراء التحاليل التالية (الفحص العام للغائط، فحص الغائط لفايروس الروتا، الفحص العام للأدرار، زرع الأدرار، زرع الدم، أشعة الصدر، فحص الأذن)

لقد تبين أن ٢٨ (٤٠%) رضيع كان فحص الغائط موجبا لهم، وكانت أعلى نسبة لبكتريا *E coli* (٦٤,٢%)، بينما ٤٢ (٦٠%) رضيع كان فحص الغائط لهم سالب، ٢٥ (٣٦%) منهم كانت لديهم التهابات خارج الأمعاء توزعت بين ذات الرئة، تسمم الدم الجرثومي، التهابات المجاري البولية، والتهاب الأذن الوسطى والبقية لم يلاحظ لديهم التهابات خارج الأمعاء

Abstract:

Key words: Acute diarrhea, Breast feeding, Enteropathogens, *E coli*, *G lamblia*, Rota virus

Background

Diarrheal diseases are one of the leading causes of morbidity and mortality in children world wide, the enteropathogens that are infectious in a small inoculum are

(*Shigella*, Enteric Viruses, *Giardia lamblia*. *Entamoeba histolytica* and *Escherichia coli*)

Objectives

To identify the causes and risk factors of acute diarrhea in breastfed infant

Materials and methods

A random sample of 70 breastfed infants was collected from the casualty and pediatric wards of Maternity and Childhood hospital in Al-Najaf city from the period of 1st of August, 2009 to the 1st of Jan, 2010 . Physical examination and growth parameter was done to each infant and investigations including (general stool examination., general urine examination , stool culture and antibiotic sensitivity, stool for Rota virus (Ag). Blood culture , chest X ray and urine culture and antibiotic sensitivity).

Results

Twenty eight (40%) of infant were found to have +ve stool examination for microorganism, and the commonest microorganism was *E. coli* in 18 (64.2%). While 42 (60%) infants have -ve stool examination 25 (35.8%) of them with signs of extra intestinal infection as (pneumonia, sepsis, urinary tract infection and otitis media) and 17 (24.2%) have no signs of extra intestinal infection, 40 (57%) of infant were partially breast fed 14 (20%) complementary feeding introduced to them and only 6 (8.5%) have full breast feeding. The growth parameters of the infants were normal and all of them were improved and discharged from the hospital in good health.

Conclusions

Exclusive breast feeding is the best way to protect the baby against diarrhea

Introduction

Diarrheal diseases are one of the leading causes of morbidity and mortality in children world wide, causing 1 billion episodes of illness and 3-4 million deaths annually. The major mechanism of transmission for diarrheal pathogen are person to person through the fecal oral route or by ingestion of contaminated food or water.^[1]

The enteropathogens that are infectious in a small inoculum are (*Shigella* species, Enteric Viruses, *Giardia lamblia*, *Entamoeba histolytica* and *Escherichia coli*

There are many factors that increase susceptibility to infection with enteropathogen including: young age , immune deficiency, lack of breast feeding, malnutrition and others.^[2]

Breast milk is the natural food for full-term and preterm infant during the first months of life, the milk is fresh and free of contaminating bacteria, human milk contains bacterial and viral antibodies including relatively high concentration of secretory IgA antibodies which prevent microorganism from adhering to the intestinal mucosa.^[1]

The protection by human milk has long been attributed to the presence of secretory IgA and to the large amount of complex carbohydrates including glycoproteins, glycolipids, mucin and specially oligosaccharide. These complex carbohydrate synthesized by many glycosyl transferase in mammary gland. These complexes may inhibit pathogen binding.^[3]

Human milk contain mucin associated glycoprotein lactadherin which binds specially to Rota virus and inhibit its' replication, a low level of lactadherin in human milk are associated with higher incidence of symptomatic Rota virus in breast fed infant. This association is independent of product on the secretory immune system^[3].

Gastrointestinal tract of breast fed infant are colonized more easily with *Bifidobacteria* than are those of formula fed infants. Colonization is through to reduce infant diarrhea by inhibition of the growth of pathogenic bacteria^[4].

Also the macrophage normally present in human colostrum and milk may be able to synthesize complement, lysozyme and lactoferrin. Breast milk is a source of lactoferrin the iron binding whey which had an inhibitory effect on the growth of *Escherichia coli*^[1].

Breast feeding may in addition to the well-known passive protection against infections during lactation, have unique capacity to stimulate the immune system of the offspring possibly with several long-term positive effects^[5].

Aim of the study

The objective of our study is to identify the causes and risk factors of acute diarrhea in breast fed infants in the first year of life.

Patients and Methods

Across sectional study was conducted in the Maternity and Child Hospital in Al-Najaf from the 1st of August, 2009 to the 1st of January, 2010.

A sample of 70 breast fed infants younger than 1 year of age complaining of diarrhea was collected randomly from causality and pediatric wards in the hospital.

The clinical data was collected from each patient including (age, sex, growth parameters and residence).

- Type of feeding (breast feeding only, partial breast feeding, complementary feeding and age of introduction of it).

- Physical examination was done to determine the degree of dehydration in addition to general physical examination, investigations were done to each patient include: (G.S.E. , stool culture and antibiotic sensitivity test, stool for Rota virus Ag) and some patient need other investigations like (CXR, G.U.E. , urine culture, blood culture).

- The treatment received by each patient was also taken into consideration in

addition to the follow up of the clinical status and out come of each one.

Results

Seventy Breast fed infants with acute diarrhea were introduced into the study, 15(21.4%) of them were less than 6 months of age and 55 (78.6%) of them were 6 months – one year age. 28 (40%) of the infants have +ve results of stool examination for microorganism while 42 (60%) have -ve results. 25 (35.7%) of infants with -ve stool examination have infection in other sites of the body as pneumonia , UTI , otitis media and sepsis which proved by CXR, urine culture and sensitivity , blood culture and sensitivity and ear examination while 17 (24.3%) of them have no signs of extra intestinal infection, table (1). The types of M.O found on stool examination were *E.coli* in 18(25.7%), Rota virus in 7 (10%) cases and *E. histolytica* in 3 (4.3%) of cases.

The relation of M.O with the infant age as seen in table (2).

- 40 (57.1%) infants were partially Bf, 24 (34.3%) of infants complementary feeding was introduced to them, and only 6 (8.6%) have full breast feeding.

Table (3) shows the relation between the type of feeding and the results of stool examination.

The growth parameters (H.C, length and weight) of all infants were normal and all infants was improved and discharged from the hospital.

Table (1) "Causes of diarrhea in stool-ve cases"

No=42	%	Causes
14	33.3%	Pneumonia
5	11.9%	Sepsis
4	9.5%	U.T.I.
2	4.8%	Otitis media
17	40.5%	No infection

Table (2) "The type of the microorganism in relation with the patients' age"(total number 70)

Microorg anism	Age > 6 months	Age < 6 months	otal
<i>E. coli</i>	10	8	8%
Rota virus	4	3	%
<i>E. histolytica</i>	3	0	%
Total	17	11	8%

Table (3) The type of feeding in relation to the results of stool examination "

Type of feeding	No=70	Stool examination +ve = 28(40%)	Stool examination - ve = 42(60%)
Exclusive Bf	2(2.9%)	0(0%)	2(4.8%)
Almost Exclusive Bf	4(5.8%)	0(0%)	4(9.5%)
Partial Bf	40(57%)	15(54%)	25(59.5%)
Mixed	24(34.3%)	13(46%)	11(26.2%)

Discussion

Most of the Bf infants with acute diarrhea have -ve stool examination for pathogenic microorganism and those infants either have parenteral diarrhea or no signs of extraintestinal infection and the diarrhea could be due to food allergy or other microorganism that need specific culture media .

Those infants with +ve stool examination are mostly more than 6 months of age and the commonest microorganism was *E. coli* and it could be due to the protective effect of human milk during the first 6 months of life and the increase in the risk of infection by introduction of complementary feeding from contaminated food and drinks. Studies in Ghana and Nigeria showed that mixed fed infants between 6-11 months tend to have higher risk of diarrhea than fully Bf infants.^[6] Similar study in USA shows that breast feeding is associated with lower illness rate and minimal breast feeding was not protective against different illnesses.^[7]

Rota virus was less common and found only in 25% of cases with positive stool examination and could be due to the presence of lacto adherin in human milk which binds specifically to Rota virus and inhibits its replication.^[8]

E. histolytica was found in stool examination of infants more than 6 months of age and due to contamination of food and drinks. Most of infants below the age of 6 months were partially Bf while exclusive Bf was found in small numbers of infants.

Conclusions and recommendations

- 1-Exclusive breast feeding is the best way to protect the baby against diarrhea.
- 2- Health education is needed to increase awareness of health professionals and public about this problem specially in our society and give the mothers advice about proper way of sterilization of bottles and equipment of baby.
- 3- Insure good water supply for baby specially those who live in rural area.

References

1. Richard E. Bchrman , MD, Robert M. Kliegman , MD, Hal B. Jenson , Nelson Text book of pediatrics, Elsivier, 18th Edition 2007 .
 2. 2- Richard J. Schanler; The pediatrics clinic of America , feeding 2001 , part II, The management of Breast feeding, , Guest Editor.
 3. Newburg -DS. Human milk glycojucate that inhibit pathogens. Curr-Med-Chem. 1999 Feb., 6 (2): 117-27.
 4. Wolin-MJ, Zhang -Y, Bank; Yerry-S, Miller-TL. NMR detection of Nifedidobacterium fermentation in the intestinal tract. J-Nutr. 1999Jan; 128(1): 91-6.
 5. Hanson-LA. Breast feeding provides passive and likely long acting immunity. Ann -Allergy-Asthma- Immunol- 1998 Dec; 81 (6): 523-33; quiz 533-4, 537.
 6. Newburg -DS ; Peterson -JA , Ruiz -Palacios -GM. Role of human - milk lactadherin in protection aginst symptomatic rotavirus infection. Lancet. 1998 Apr; 18; 351 (9110): 1160-4.
 7. Raisler-J; Alexander-C; O Campo-P. Breast Feeding and Infant Illness. Am-j-public-health. 1999jan;8, (1): 25-30.
- Wan-C; Philips -MR; Dibley-MJ; Liu-Z. Randomized Trail of different rates of feeding in acute diarrhea.Arch-Dis-child-1999 Dec; 81 (6):487-91.