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ORIGINAL ARTICLE

Breast milk and Bottle Milk in relation with gastroenteritis

by

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Abstract

A study on 1043 children aged 3 days to 2 years hospitalized in the Department of Child Health, from 1 January to 31 December 1976, was made to find out the relation between breast milk and bottle milk with gastroenteritis, especially concerning bacterial, fungal infection and fat malabsorption. The results were as follows :

1. *Bacterial and fungal infection in bottlefed infants were 4 × and 13 × higher than in breastfed infants, respectively.*
2. *Fat malabsorption was 4 × higher in bottlefed infants as compared with breastfed infants.*

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Introduction

The main advantages of breast feeding is the presence of anti microbial factors such as secretory Ig A (antiviral activity, E. coli, Salmonella, Staphylococcus, C. albicans).

Other Imunoglobulins (Ig G, Ig M, Ig E) act also as protector of the gut so do lactoferrin (anti E. coli, Staphylococcus, C. albicans), lysozym (anti E. coli, Salmonella), lactobacillus bifidus growth factor (anti Shigella, E. coli, C. albicans), anti Staphylococcus, Leucocytes (phagocytosis, Cell Mediated Immunity, IgA product, Lysozym, Lactoferrin, C4, C3), C4 and C3 (Anaphylatoxic activity, opsonic, chemotactic) (Goldman et al., 1973 Raimbult, 1974).

The suggestion of continuation of breast milk is very efficatious, even the child suffer from diarrhoea (Morley, 1976).

The preparation of bottle milk in a certain population, especially the group of low income, as the facility and personal health education (hygiene water, healthy living and so on) were not adequate yet, will cause contamination of the intestine, such as bacteria or fungi (Jellife, 1976), which can give diarrhoea.

A study in infantile gastroenteritis, especially in PEM, at the Department of Child Health (Gracey et al., 1973) had proved that there was intestinal contamination with various kind of microbacteria, such as anaerobic bacteria as high as 33.3%,which will change "conjugated bile salts" into deconjugated form (Gracey et al., 1973).

By the reduction of bile salts and together with many other factors, fat malabsorption will occur since conjugated bile salts were needed for the formation of micelles (Suharyono, 1976), Thus in infant fed with bottle milk the incidence of fat malabsorption will also increase.

The purpose of this investigation are to investigate the relationship between breast milk and bottle milk with regard to problems in gastroenteritis :

1. To study intestinal infection (bacteria, fungal) in breastfed infants compared with bottlefed infants.
2. To investigate the frequency of fat malabsorption in breast fed infants compared with bottle fed infants.

Material and method

One thousand and forty three infants aged 3 days to 2 years old were hospitalized with gastroenteritis dehydration at the Department of Child Health, Medical School, University of Indonesia, Dr. Cipto Mangunkusumo Hospital.

Examination had been done on cause of diarrhoea, i.e. intestinal infection (enteric infection) and fungal infection by gram staining or/and culture.

Those who are suspected had fat malabsorption were examined on Lipidol Absorption Test (LAT) (Gracey et al., 1974, Suharyono et al., 1976).

TABLE 1: *Distribution of infants with breast milk or other feeding*

Type of feeding	Number of infant	Percentage
1. Breast milk	103	9.9
2. Bottle milk	391	37.5
3. Breast milk + Bottle milk	103	9.9
4. Breast milk + Solid food	159	15.2
5. Breast milk + Bottle milk + Solid food	74	7.1
6. Others solid food, bottle milk + Solid food	213	20.4
Total	1.043	100

TABLE 2: *Percentage of intestinal infection (bacterial and fungal) of breastfed and bottle-fed infants with Gastroenteritis.*

	Feeding	
	Breast fed	Bottle fed
1. Bacterial Infection	3.6%	14,1%
2. Fungal Infection	1.3%	17.1%

TABLE 3: *Percentage of intestinal infection (bacterial and fungal) on infants fed with breast milk + bottle milk, breast milk + solid food, breast milk + bottle milk + solid food and bottle milk + solid food or solid food only suffered from Gastroenteritis.*

	Feding				
	Breast milk + bottle milk	Breast milk + Solid food	Breast milk + bottle milk + solid food	Bottle milk + solid food	solid food only
1. Intestinal infection due to bacteria	3.3%	3.0%	1.4%	1.5%	0,3%
2. Intestinal infection due to fungus	1.8%	1.5%	0.4%	0.8%	—

TABLE 4 : *Breast milk and bottle milk in relation with fat malabsorption*

	Breast milk	Bottle milk	
Fat malabsorption	1.4%	6.5%	

Discussion

Recently there is a trend of substituting breast milk with bottle milk, although the high value of breast milk is well known. In general, the discussion on breast milk and bottle milk in relation with gastroenteritis, will include :

1. The frequency of gastroenteritis in breastfed compare with bottlefed infants.
2. The cause gastroenteritis (bacterial or fungal or others) on breast milk compared with bottle milk, where "protective" factors do not exist in the bottle milk compared with breast milk, and difficulties to obtain the sterility of bottle milk compared with breast milk.
3. The relation with the complication of gastroenteritis which easily happened in connection with differences of electrolyte composition between breast milk and bottle milk for example :
   - — in bottle milk, sodium content is higher than in breast milk, so that hypernatremia will occur more easily.
   - — in bottle fed infants, blood urea is higher than in breast fed infants, so that a complication of gastroenteritis will be expected if the blood urea content is more than 51 mg % (Jelliffe, 1976).
   - — In breastfed infants with gastroenteritis a complication of hypokalemia is easier than bottle fed since in breast milk the potassium content is lower. Hypokalemia exist in breast fed infant group 2 × more frequent (Jusniar et al., 1978)
4. The nutritional composition of breast milk as compared with bottle milk. Breastfed infant will give less fat malabsorption, since there is a specific lipase activity in breast milk. In bottle milkfed infant, fat malabsorption will occur more early since the long chain triglyceride content is high the bacterial over growth is prone to occur which influence the conjugated bile salts".

This paper deals particularly in connection with the gastroenteritis with special attention to bacterial infection, fungal infection and fat malabsorption (in relation with anaerobic bacteriae).

Hambreaus et al. (1977) were of the opinion that anti infective proteins, lysozyme and lactoferrin in cow's milk did not exist, while in breast milk there were lactoferrin, immunoglobulin in high

concentration, which had the protective effect, particularly against enterovirus and E. coli (Goldman and Smith, 1975). In this study the total of infants fed with breast milk is 42.1%.

In infants with bottle milk the incidence of gastroenteritis is 4 × higher than in infants with breast milk and this could be due to the presence of "protective factor" as well as sterility of breast milk which are practically lacking in bottle milk.

The role of breast milk can be seen in the tables. If the child is fed continuously with breast milk (or bottle milk combined with breast milk), the incidence of gastroenteritis is less than in infants fed without breast milk, that is 7 - 15% compared with 20.4-37.5%.

In this study show that bacterial infection in infant with bottle milk is 4 times higher than infant with breast milk, while fungal infection 13 - 14 times higher.

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