

## ORIGINAL ARTICLE

## Determine Theadverse Effects of Formula Milk on Infants

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## ABSTRACT

**Objective:** To determine the adverse effects of formula milk in infants presented to our institution.

**Study Design:** Retrospective/observational

**Place and Duration:** The study was conducted at Paediatric Department of Liaquat University Medical Hospital Jamshoro and Civil Hospital Khairpur Mir's.

**Methodology:** Total 85 formula-fed infants of both genders with ages upto 2 years were included in this study. Detailed demographics including age, sex, weight, residence and socio-economic status were recorded after taking informed written consent from guardians/parents. Adverse effects such as iron deficiency, low weight, gastroenteritis, type I diabetes mellitus and autoimmune disease were examined. Data was analyzed by SPSS 24.0.

**Results:** There were 45 (52.94%) females while 40 (47.06%) were males. Mean age was  $1.86 \pm 1.02$  years. 52 (61.18%) patients had urban residence and majority 50 (58.82%) had high socio-economic status. Iron deficiency was found in 38 (44.71%) infants, 32 (37.65%) infants had abnormal low weight, 24 (28.24%) had gastroenteritis/diarrhea, 18 (21.18%) infants had type I diabetes and 14 (16.47%) infants had autoimmune disease.

**Conclusion:** It is concluded that formula milk was associated with many of adverse effects, the most common was iron deficiency and low weight. Mothers should be aware of these adverse effects of formula fed.

**Keywords:** Formula Milk, Infants, Iron Deficiency, Low Weight, Infection, Type I Diabetes.

## INTRODUCTION

Health results differ significantly from those in wealthy countries like the United States for moms and infants which fed formula compared to those who feed breasts. Unfortunately, breast-feeding rates in the US remain short of the recommendations of the World Health Organization that the first 2 years of life be fed to children. [1] The American Academy of Pediatrics (AAP), [2] and the American Academy of Family Physicians (AACFP) [3] are recommending exclusive breast-feeding for the first 6 months of their lives. In the US only 74% of infants were breast-fed after delivery at least once in 2005, only 32% were breast-feeding at 3 months of age and only 12% were breast-fed exclusively at 6 months of age. [4]

The 'benefits of breastfeeding' have been described in public health campaigns and medicine literature comparing health effects of newborns with those of a reference group of formula fed. [5] While the 'risk of not breastfeeding' is statistical synonymous, this methodology implies that infant formula is the standard method for feeding an infant. This minor distinction has a significant impact on child feeding impressions. [6-8]

## MATERIALS AND METHODS

This retrospective/observational study was carried out at Paediatric Department of Liaquat University Medical Hospital Jamshoro and Civil Hospital Khairpur Mir's and comprised of 85 cases. Patients details demographics age, sex, weight, residence and socio-economic status were recorded after taking informed written consent from

guardians/parents. Infants with breast feeding and those did not give any written consent were excluded from this study.

Formula-fed infants of both genders with ages upto 2 years were included in this study. Adverse effects such as iron deficiency, low weight, gastroenteritis, type I diabetes mellitus and autoimmune disease were examined. Data was analyzed by SPSS 24.0. Categorical variables were assessed by percentages and frequencies.

## RESULTS

There were 45 (52.94%) females while 40 (47.06%) were males. Mean age was  $1.86 \pm 1.02$  years. 52 (61.18%) patients had urban residence while 33 (38.82%) had rural. Majority 50 (58.82%) had high socio-economic status and the rest were from low socio-economic status. (Table 1)

Table 1: Demographically details of enrolled cases

Variables	Frequency (n=85)	%age
Mean age		
Gender		
Male	40	47.06
Female	45	52.94
Residence		
Urban	52	61.18
Rural	33	38.82
Socio-economic status		
Low	50	58.82
High	35	41.18

Iron deficiency was found in 38 (44.71%) infants, 32 (37.65%) infants had abnormal low weight, 24 (28.24%) had gastroenteritis/diarrhea, 18 (21.18%) infants had type I diabetes and 14 (16.47%) infants had autoimmune disease.(Table 2)

Table 2: Adverse outcomes among formula fed infants

Variables	Frequency	%age
Adverse outcomes		
Iron deficiency	38	44.71
Abnormal Low Weight	32	37.65
Gastroenteritis/diarrhea	24	28.24
Type-I diabetes	18	21.18
Autoimmune disease	14	16.47

## DISCUSSION

In comparison to breastfed children, the risk of infectious morbidity is greater in the first year of life in formula-fed infants. Specific and innate immune components contained in human milk are part of these disparities in health consequences. In this retrospective study 85 formula fed infants of both genders age upto 2years were presented. Mean age was  $1.86 \pm 1.02$  years and majority of the infants 52.94% were females. Our findings showed resemblance to the previous studies.[9,10]

Most of the patients 61.18% were from urban areas in our study.[11] Majority 50 (58.82%) had high socio-economic status and the rest were from low socio-economic status. Different studies showed adverse outcomes of formula milk among infants and suggested maternal breast feeding for infants to avoid deficiencies in born babies.[12-14] In our study iron deficiency was found among 44.71% patients after use of formula milk.[15] Abnormal low weight was the second most common adverse outcome found in 37.65% in this study. [16,17,23]

Prevalence of diarrhea was among 28.24% cases, this shows resemblance to the previous study conducted in Vietnam.We found that formula milk resulted diabetes of type-1 among 21.18% cases.[18]A randomized, controlled trial determined that whether cow's milk formula enhances formation of islet-cell antibodies. Infants at high risk of type 1 diabetes have been randomized to supplementation with hydrolysate formula versus cow's milk formula. In a pilot study, exposure to cow's milk-based formula was related with increased incidence of islet cell auto-antibodies, giving suggestive evidence for a causal relationship between cow's milk exposure and type 1 diabetes.[19]

In current study autoimmune disease was found among 16.47% cases. Infection protection is known to be immune to the breastmilk. In the first few days of life, on the other side, prelacteal food and formula milk may increase the exposure of the infant to environmental toxins as a result of non-breastmilk supplementation and affect the microbiota.[20-22] In formulafed infants, several research found modestly lower IQ values compared to breastfed children, but in other studies there was no relationship between newborn feeding and intellect. Observatory data should be examined cautiously because of confusion of maternity and socioeconomic status. However, there is evidence of developmental abnormalities with shorter lactation durations in 2 randomized controlled trials.[24,25]

Formal feeding is related to unfavorable health consequences, ranging from infectious morbidity to chronic disease for both mothers and children. Because of the substantial evidence of health outcome differences, breastfeeding should be recognized as the biological standard for feeding infants. Medical advice and clinical practice should be combined to ensure a best chance for a long, effective breastfeeding experience in the breastfeeding mother-infant dyad.

## CONCLUSION

It is concluded that formula milk was associated with many of adverse effects, the most common was iron deficiency and low weight. Mothers should be aware of these adverse effects of formula fed.

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