

Clinical assessment of feeding bovine colostrum to preterm infants

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Abstract: Preterm infants are neonates born at less than 37 weeks' gestation and gastrointestinal (GI) problems and sepsis are major challenges in NICU, Bovine colostrum (BC) has direct antimicrobial and endotoxin-neutralizing effects throughout the alimentary tract, as well as other bioactivities that suppress gut inflammation and promote mucosal integrity and tissue repair under various conditions related to tissue injury. So, we were studied if there was an effect of BC on preterm infants to prevent serious conditions. Supplementation of bovine colostrum (BC) has shown to decrease incidence of feeding intolerance and sepsis. Days on parenteral nutrition, days for full enteral feeding, days to regain birth weight and days of hospitalization are also decreased. Serum iron level is increased but serum ferritin level is decreased. Further studies are required for more accurate evaluation.

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1. Introduction

Preterm infants are a unique group of patients in the Newborn Intensive Care Unit (NICU), because these infants are so physiologically immature^[1] and the risk of complications increases with increasing immaturity^[2]. In these infants, full enteral feedings are generally delayed because of the severity of medical problems associated with prematurity^[3]. Human milk is recognized as the optimal feeding for all infants because of its proven health benefits to infants and their mothers^[4] although it is not always available in NICU, so bovine colostrums is a new trial to improve gastrointestinal functions and immunity system as it is a main source of immunoglobulins specific to many human pathogens^[5] and also has antioxidant components, and many growth factors^[6].

Aim

Clinical assessment of feeding bovine colostrum to preterm infants with birth weights between 1000 and 1800 gm.

2. Methods

The study included 100 preterm infants. Babies were randomized to two groups as 50 preterm babies were fed milk formula and bovine colostrums (group A) and 50 preterm babies were fed milk formula only (group B).

All cases underwent clinical assessment including personal data (name, sex, gestational age,

type of delivery), general examination (weight, color, heart rate, blood pressure, capillary refilling time and respiratory rate), systemic examination, observation of incidence of serious condition as sepsis and necrotizing enterocolitis (NEC) and specific measures (weekly measured anthropometry, days on parenteral nutrition, days for full enteral feeding, days to regain birth weight and serial measurements of laboratory tests including complete blood count (CBC), c-reactive protein (CRP), urea, creatinine, Na, K, blood gases, serum iron and serum ferritin.

3. Results

The two groups were homogenous prior to the study and the main goals that achieved in the study was tolerability of bovine colostrums (P=0.000), decreasing incidence of feeding intolerance, the duration of use of parenteral nutrition, the duration to regain birth weight (Table 1) and reduce the time of hospitalization. Another interesting finding in the study was that infants in the patient group had lower rate of incidence of neonatal sepsis (Table 2).

The laboratory investigations showing that the total leucocytic counts and C- reactive protein measurements were lower in group A than those in group B. Serum iron level was higher in patient group and lower level of serum ferritin in the same group.

There were no significant differences between the two groups in the incidence of NEC (P=0.153).

Table 1: Comparison between Group A & Group B regarding incidence of feeding intolerance, days on parenteral nutrition, days for full enteral feeding and days to regain birth weight:

		A	B	
		No. = 50	No. = 50	P-value
Incidence of feeding intolerance	No	50(100.0%)	42(84.0%)	0.003
	Yes	0(0.0%)	5(16.0%)	
Days on parenteral nutrition	Mean±SD	13.26±3.62	17.18±6.4	0.000
	Range	7-26	10-46	
Days for full enteral feeding	Mean±SD	16.28±3.63	20.58±7.09	0.000
	Range	10-29	13-53	
Days to regain birth weight	Mean±SD	25.2±6.42	35.14±10.84	0.000
	Range	14-51	18-67	

Table 2: incidence of sepsis in both groups:

		A	B	
		No. = 50	No. = 50	P-value
Incidence of sepsis	No	32(64.0%)	19(38.0%)	0.009
	Yes	18(36.0%)	31(62.0%)	

3. Discussion

It is expected that preterm infants will experience some loss of birth weight in the immediate postnatal period, the period between nadir of weight loss and return to birth weight as well as percentage of birth weight lost is highly variable, especially for extremely preterm^[2].

Enteral feeding is begun as soon as the patient is clinically stable. The mothers milk is the proper nutrition for their babies, but it is not always available in most intensive care units so we looked for an alternative gives us most of the benefits of breast milk and can be accessed easily.

Recently, some manufacturers of drugs stiffly milk colostrum in several forms, such as capsules, powder and others, after the many uses that appeared to milk colostrum such as anti-diarrheal effect and respiratory infections reduced by improving the immune mechanisms. Also, it is used in adults for the thinness and by athletes for muscle building.

We were interested in bovine colostrums because it is one tool you can employ to help support healthy digestive and immune system function. It not only protects the digestive tract from nasty bacterial infections, but also reduces the toxicity of those infections, and repairs the lining of the GI tract. Bovine colostrum contains very high levels of what scientists call a magic ingredient, pancreatic secretory trypsin inhibitor^[7], which directly orchestrates the repair of the digestive tract. It works to prevent bacterial infections in the digestive tract as well as how its ability to repair the digestive tract prevents bacteria from entering your body through a leaky gut^[8] and causing major health problems. Bovine colostrum shows directly lowers NF-kappaB^[9] in

intestinal cells, the key inflammatory gene signal that is elevated during tissue destruction of the GI lining.

In our study, all cases in group A tolerate the feeding with bovine colostrums (p=0.000) and decreasing incidence of feeding intolerance (P=0.003) and therefore reflected to reduce the time of hospitalization (P=0.024), the duration of use of parenteral nutrition (P=0.000) and the duration to regain birth weight (P=0.000).

Another interesting finding in our study was that infants in the patient group had lower rate of incidence of sepsis (P=0.009). Total leucocytic counts and C-reactive protein measurements were lower in group A.

In our study, Serum iron level was higher in group A than those in group B (control) There were no significant differences between patient group and control group in the incidence of NEC (P=0.153).

Conclusion

Feeding bovine colostrums has beneficial effects on the health of preterm infants as it improves GI functions that decrease the period on parenteral nutrition and decrease the incidence of sepsis, so the duration and cost of hospitalization will be reduced.

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