



ChyloBEST

Chylothorax in Infants and Nutrition with Low Fat Breast Milk

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Introduction

The incidence of post surgical chylothorax (CT) is 5-9,2 % in neonatal heart surgery (10 % at Heart Center Leipzig). CT is managed by drainage and low fat diet using Formula ("Basic-F"). Low fat diet is usually mandatory for few weeks to prevent re-accumulation of chyle. Advantages of breast milk especially for operated infants are well known. The possibility of using breast milk for this patients would be an eligible innovation. The trial ChyloBEST is focused on the management of CT with low fat breast milk (LFBM) as well as the cause of CT. Incidence of CT may be potentially related to increased complexity of neonatal heart surgery.

Year	newborns surgery at Heart Center Leipzig	post surgical chylothorax	Incidence of chylothorax in newborns
2011	55	5	9,09%
2012	75	5	6,94%
2013	56	5	8,93%
2014	79	12	15,19%
2015	62	6	9,67%
2011-2015	324	33	10,10%

Table 1: Incidence of post surgical chylothorax at Heart Center Leipzig last five years

Methods

We report a prospective non-randomized multicenter (Leipzig, St. Augustin) pilot study. ChyloBEST includes neonates with congenital heart disease and post surgical CT (n = 16). To receive LFBM human milk will undergo kryo centrifugation for 15 minutes at 2° C. The fatty layer will separate on the top of the milk sampling. It can be easily removed mechanically. The amount of fat, carbohydrates, proteins and energy were determined. By adding high quality fat additives (MCT-Oil) and common human milk fortifier LFBM is prepared for feeding. To prove the efficacy of this diet following items were monitored: drained amount of pleural effusion, recurrence of CT, physical development within three month after diagnosis.

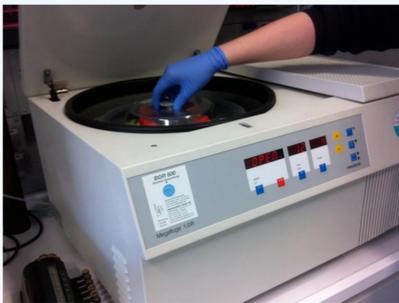


Illustration from left to right: Kryo centrifugation for 15 minutes at 2° C; milk tubes after kryo centrifugation show the separated milk: fatty cream and skimmed milk; removal of the cream by spoon

Previous results

By kryo centrifugation the fat content of breast milk could be reduced significantly. The content of other nutritional milk components of LFBM remained unaltered (meanFat: 0,36%*, meanProtein: 1,5%, meanCarbohydrate: 7,1%, meanEnergy: 39,3 kcal/100ml). To date, 16 patients (n=5 Norwood-stage1, n=6 arterial switch, n=1 TAPVD-redir., n=1 Glenn, n=1 TAC-correction, n=1 CoA-resection, n=1 complex VSD-closure) received LFBM diet. CT resolved in all cases. There was no CT relapse when returning to full fat breast milk even in cases diet was performed less than six weeks. After LFBM diet ten patients (62,5%) achieved exclusive breastfeeding and well thriving.

Patient data: surgical procedure, age at surgery, GA	duration of lfbm diet	heart center
art. switch, 12. day of life (39 GW)	14	St. Augustin
art. switch, 15. day of life (36 GW)	40	Leipzig
art. switch, 9. day of life (39 GW)	29	Leipzig
art. switch, complex, 5. day of life (40 GW)	41	Leipzig
art. switch, 10. day of life (37 GW)	22	St. Augustin
art. switch, complex, 10. day of life (38 GW)	20	St. Augustin
CoA resection, complex, 5. day of life (36 GW)	21	St. Augustin
Norwood I, 5. day of life (40 GW)	14	St. Augustin
Norwood I, 12. day of life (38 GW)	28	St. Augustin
Norwood I, 17. day of life (38 GW)	35	Leipzig
Norwood I, 3. day of life (39 GW)	42	Leipzig
Norwood I, 6. day of life (39 GW)	47	Leipzig
TAPVD redirection, 3. day of life (39 GW)	45	Leipzig
Glenn-anastomosis, 7. month and 5 days old	42	Leipzig
persistent truncus arteriosus correction, 49. day of life (35 GW)	52	Leipzig
VSD-closure, complex, 28. day of life (37 GW)	11	St. Augustin

Table 2: Chylothorax is associated with complex heart surgery. Low fat breast milk diet led to no recurrence of a chylothorax.

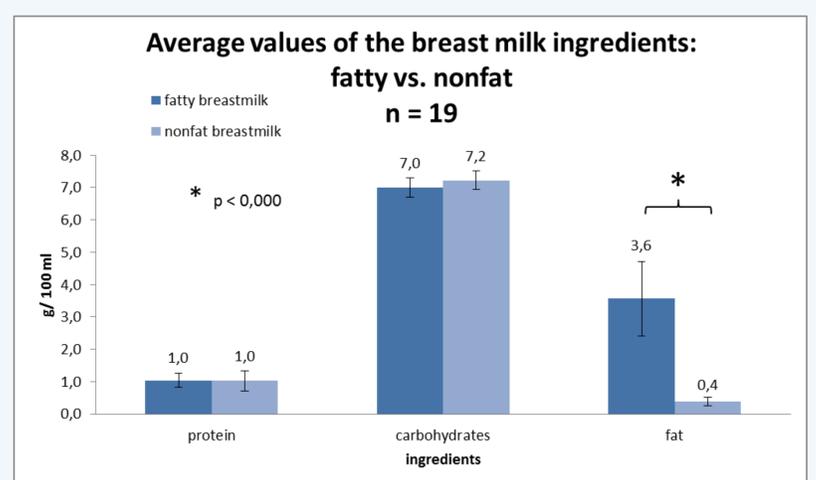


Table 3: The average values of the fat content was significantly reduced by kryo centrifugation.

Conclusion

Producing low fat breast milk is technically easily feasible. In case of post surgical Chylothorax low fat breast milk diet seems to be a reliable nutrition form including the advantages of breast milk feeding.