The Effect of Early Parenteral Nutrition on Return to Birth Weight and Gain Weight Velocity in Preterm Infants

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BACKGROUND

Early parenteral nutrition in preterm infants may prevent extra-uterine growth restriction and improve long term outcomes but previous studies had various results and still unclear [1,2,3,4].

OBJECTIVE

We analyzed the effect of early parenteral nutrition on the preterm infant growth pattern in which assessed through the Return To Birth Weight (RTBW) and Gain Weight Pattern (GWV) parameters.

METHOD

We conducted an interventional analytical study with open label randomized controlled trial design. The subjects were 44 preterm infants with gestational age of less than 33 6/7 weeks, birth weight between 1000-2500 grams and unable to receive daily nutritional needs through oral or enteral which were divided into control group (n=23) that received PN since day 3 and intervention group (n=21) that received PN since day 1.

RESULTS

The mean birth weight of the treatment group (1459 g) was lower than the control group (1726 g) (p=0.04). Both groups did not differ significantly (p≥0.05) in the mean RTBW. Treatment group had a larger weight loss than control group on day 1 and 3rd (p<0.001; 0.02) and did not have weight loss difference on day 7th, 10th, and 14th (all p≥0.05). Treatment groups had higher mean in energy, proteins and lipids on day-0 and 3(all p<0.05) but similar on day 7th and GIR (p≥0.05). Treatment group had a faster GWV compare to control group on day 1st and 3rd (p<0.001; 0.02) and similar GWV on day 7th, 10th and 14th (all p≥0.05).

Table 1. Sample Characteristic in Both Groups

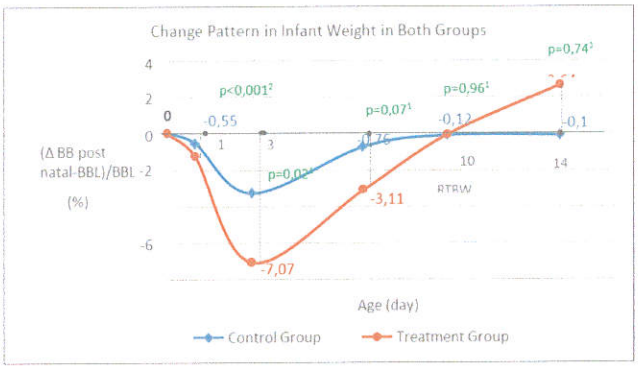
	Treatment Group (n=21)	Control Group (n=23)	p
Gestational age, median (min-max)	31 (27-34)	33 (28-34)	0.23[1]
Number of Pregnancy, n (%)			0.84[3]
a. Single	14 (66.70)	16 (69.60)	
b. Multiple	7 (33.30)	7 (30.40)	
Birth anthropometry, mean (SD)			
a. Birthweight (gram), mean(SD)	1459.52 (±373.37)	1726.09 (±447.69)	0.04[2]*
b. Birth length (cm), median (min-max)	40 (33-47)	43(36-48)	0.35[1]
c. Head circumference (cm), median (min-max)	28 (20-32)	30(25-34)	0.21[1]
Kategori masa kehamilan, n (%)			1.00[4]
a. Normal	19 (90.50)	21 (91.30)	
b. IUGR	2 (9.50)	2 (8.70)	
Sex, n (%)			0.06[3]
a. Male	6 (28.60)	13 (56.50)	
b. Female	15 (71.40)	10 (43.50)	

*Significant for p < 0.05, [1]Mann-Whitney U test, [2]Independent T test, [3]Chi Square Test, [4]Fisher Exact Test

Table 2. Growth Pattern in Both Groups

Growth Pattern	Treatment Group (n=21)	Control Group (n=23)	P
RTBW, median (min-max) (day)	8 (0-20)	7 (0-21)	0.85[1]
RTBW >14 hari, n(%)	2 (9.50)	4 (17.40)	0.67[2]
GWV, median (min-max) (gram/kg/day)	18 (10-34.30)	16.33 (5-33)	0.14[1]
Post natal weight loss(%), median (min-max)	11.20 (0-20.20)	5.22 (0-23.66)	0.04[1]*

*Significant for p < 0.05, [1]Mann-Whitney U Test, [2]Fisher Test



Picture 1. Change Pattern in Infant Weight in Both Groups

CONCLUSION

Early initiation of parenteral nutrition in premature infant had no effect in RTBW. However, it effected the acceleration of GWV in the first 3 day of life. No differences found in the short term outcome can be caused by the fluid and water balance not the difference of energy and protein.

KEYWORDS

Parenteral Nutrition, Return to Birth Weight, Gain Weight Velocity, Preterm Infant

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