

Original Research :

Early aggressive partial parenteral nutrition in very low birth weight infants

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Abstract :

The weight gain of VLBW infants started on early aggressive Partial Parenteral Nutrition (PPN) was analyzed from January 2010 to December 2013. 141 VLBW infants were studied. Average weight gain (g/kg/day) was 16.2 ± 2.2 (<1000g), 17.3 ± 3.4 (1000-1250grams) and 16.8 ± 2.9 (1250-1500grams) which is comparable to norms (15-20g/kg/day).

Key words : growth, parenteral nutrition, neonate, very low birth weight.

Introduction :

Extra-uterine growth failure influenced by sub-optimal nutrition, intrauterine growth and neonatal morbidities occurs in more than 90% of babies born very preterm and influences CLD rates, subnormal long-term physical growth and neurodevelopment outcomes of the baby [1-5]. Even-though, experimental evidence has shown the role of parenteral nutrition (PN) on neurodevelopmental outcomes, its use is often based on the local tradition. Evidence argues the critical importance of providing PN as early as possible [6,7]. Due to various limitations, PN is less frequently practiced in neonatal units across India. We studied to investigate the role of early aggressive partial parenteral nutrition on weight of VLBW infants.

Study design and methodology: This prospective study was conducted at a level 3B unit in Bangalore, India from January 2010 and December 2013. VLBW infants, less than

1500grams, receiving early aggressive parenteral nutrition and survived till discharge, were eligible for the study. Parenteral nutrition was started at 3grams/kg of protein (10% Aminoven) and 1gram per/kg of lipids (20% Intralipid) on day 1 of life. Lipids were increased to 2g/kg on day 2, 3g/kg on day 3 and 3.5g/kg on day 4 of life. Proteins were increased to 3.5g/kg on day 3 of life. PPN was continued till the neonate reached full enteral feeds (150ml/kg) and then stopped. Glucose infusion with glucose infusion rate of 6-8mg/kg/min was initiated and titrated based on blood glucose. Characteristics of infants and the outcome measures were examined descriptively using mean \pm SD and frequency percentages.

Results & Discussion:

During the study period 141 VLBW infants were studied. Demographic parameters and the outcome measures are shown in table 1. The average daily weight gain of VLBW infants on aggressive PPN was between 16-17g/kg/day, which is acceptable as per norms (15-20g/kg/day). The infants regained birth weight earlier than expected (1-1.5weeks). Studies done has shown early initiation of parenteral nutrition on first day decreases catabolism and improves the net protein accretion [8,9] and thereby decreases the duration of suboptimal nutrition which is essential in intensive care [10]. Although, the major concerns of high protein are azotemia, hyperammonemia and metabolic acidosis [11,12,13], Valentine et al has shown aggressive parenteral nutrition by initiating proteins at 3g/kg was safe and improves the weight

gain and decreases the duration of PPN [8]. This is the first study does show that PPN is a good alternative, but where facilities are available TPN is the ideal for growth of VLBW infants. This study does have limitations that weight is the only growth parameter analyzed and we do not have the follow up data of these infants who received PPN. Rather depriving infants of TPN in our country because of various reasons, PPN is a very convenient and cost effective option for giving parenteral nutrition so that growth is not affected and hence will improve their future neurodevelopmental outcome which is the need of the hour presently when it comes to managing VLBW infants in our country where resources are very limited.

What is already known? Total parenteral nutrition improve the short and long term outcome in VLBW infants

What this study adds? Partial parenteral nutrition, early and aggressive, is an alternative and acceptable measure of providing nutrition in VLBW infants

Abbreviations:

PPN-Partial parenteral nutrition, VLBW-Very low birth weight.

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Figure 1: Consort diagram for the study

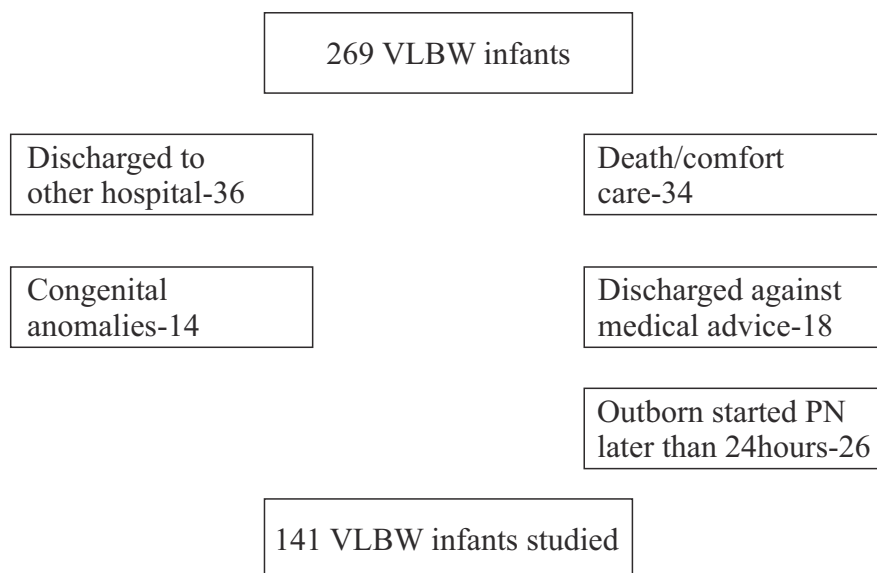


Table 1: Demographic parameters and outcome measures between three groups

	Group A (<1000grams) n=35	Group B (1000-1250grams) n=51	Group C (1250-1500grams) n=55
Birth weight(g) , mean±SD	882±55	1125±80	1384±79
Male: Female	15:20	27:24	30:25
Lowest weight recorded (g), mean±SD	817±70	1038±86	1261±80
Day reached birth weight, mean±SD	8.7±6	10±6	10±5
Average weight gain (g/kg/day) mean±SD	16.2±2.2	17.3±3.4	16.8±2.9
Day when PPN stopped, mean±SD	15±13	13±6	11±5
Discharge weight (g), mean±SD	1680±246	1693±137	1733±170
Age at discharge, mean±SD	56±19	40±17	25±12