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METHODS AND METHODS OF PARENTERAL NUTRITION IN POSTOPERATIVE CONDITIONS IN INFANTS

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Annotation. This article discusses the methods and methods of parenteral nutrition in postoperative conditions in infants.

Keywords: infants, surgery, parenteral nutrition methods, methodological methods, medicine.

Parenteral nutrition of premature infants before or when enteral nutrition of infants is impossible for a long time provides an adequate supply of water, energy sources, amino acids, electrolytes and vitamins for their growth. It is life-saving in cases of refractory diarrhea, extensive intestinal resection and extremely low body weight. Infusion solutions are administered by puncture or surgically into a catheter placed in a central vein or through a catheter in a peripheral vein. The catheter can also be inserted into the umbilical vein for a short time. The goal of parenteral nutrition for infants is to provide the child with adequate calories for growth through the administration of glucose, fat emulsions, and amino acids. For this, use a synthetic amino acid mixture at a concentration of 25-30 g/l and a 10-15% glucose solution with the addition of appropriate amounts of electrolytes, vitamins, and trace elements. The concentration of glucose solutions when administered intravenously should be below 12.5%. Central venous catheters can be injected with glucose solutions up to 25%, but they are rarely used. Fat emulsions for intravenous administration have a concentration of 20%. Intralipid (2.2 kcal/ml), which is usually used to feed premature infants, provides sufficient calories without significantly increasing the osmotic load, eliminates the need for intravenous administration of concentrated glucose solutions, and provides essential fatty acids. Intralipid is started at a dose of 0.5 g/kg/day. Gradually, if the triglyceride level remains normal, the dose is increased to 3 g/kg/day. To prevent fatty acid deficiency, a dose of 0.5 g /kg/day is sufficient. Electrolytes, trace elements, vitamins are administered in the amount necessary to meet the need for them. The volume and composition of the infusion solution for feeding premature infants are adjusted daily based on clinical and biochemical data.

The infusion is carried out at a low, constant rate. The components of the infusion solution should be mixed under aseptic conditions by a qualified pharmacist. When the caloric value of total parenteral nutrition of premature infants exceeds 100 kcal/kg, the newborn should receive 15 g/ kg / day of body weight gain without serious diseases (for example, sepsis) or surgical interventions and a positive nitrogen balance of 150-200 mg / kg. / day To overcome the predominance of catabolism in the first week and then the indicated weight gain, it is usually sufficient to inject a mixture of amino acids into a peripheral venous catheter at a dose of 2.5-3.5 g / kg / day, 10% glucose solution and

intralipid at a dose of 2-3 g/kg/day. Complications of total parenteral nutrition of premature infants are associated with difficulties in the metabolism of venous catheterization and components of the infusion solution. Septicemia is most dangerous when using central veins. This risk can be reduced by careful care of the catheter and aseptic preparation of solutions. The most common causative agent of septicemia is staphylococcus aureus. Antibacterial therapy is indicated. If it is ineffective (re-isolation of the pathogen from the blood during treatment), the catheter is removed. In addition, vein thrombosis, catheter displacement, and accidental subcutaneous injection of the infusion solution are possible. Septicemia is extremely rare when using peripheral veins, but superficial infection, phlebitis, and skin necrosis are possible. Metabolic complications in the nutrition of premature infants include hyperglycemia due to the introduction of concentrated glucose solutions. This leads to osmotic diuresis, dehydration, azotemia and is accompanied by the risk of nephrocalcinosis. Hypoglycemia occurs when the infusion is accidentally stopped. The introduction of fat emulsions can be complicated by hyperlipidemia and, possibly, hypoxia, amino acid mixtures - hyperammonemia. Metabolic bone damage, liver damage or cholestatic jaundice develop with prolonged parenteral nutrition. The frequency and severity of complications require careful monitoring of physiological and biochemical parameters with parenteral nutrition of premature infants. Enteral nutrition of premature infants requires an individual approach. It is important to avoid fasting and aspiration due to regurgitation or during feeding. No feeding method, if it is performed by inadequately trained personnel, is immune to these complications. Nipple feeding is not indicated for respiratory distress, hypoxia, shock, excessive secretion of mucus in the respiratory tract, retching, profound immaturity, CNS depression, severe diseases (e.g., sepsis). In such cases, tube feeding, parenteral nutrition of premature infants is necessary to meet the need for nutrients, water and electrolytes. Breastfeeding is possible only with strong sucking, coordination of swallowing movements with the closure of the larynx by the epiglottis and the closure of the nasal cavity by the palatine diaphragm and with normal peristalsis of the esophagus. Synchronization of these processes is rarely established before 34 weeks. gestational period. Children born at 34 weeks and later can usually be fed through the breast and even applied to the breast. However, due to the relative weakness of sucking movements, they suck the breast worse than full-term babies. Initially, it is recommended to feed these children with breast milk through the breast. The latter should be soft, with a small diameter, with a large opening. For feeding premature babies with relatively low birth weight, soft plastic probes with an internal diameter of 0.05 cm, a rounded atraumatic tip, with two holes. The tube is inserted through the nose, so that its lower 2.5 cm should be in the stomach, and at the upper end there is an adapter for connecting a syringe. A measured amount of milk or formula is injected using an intravenous pump at a constant rate or by gravity. The tube is changed every 3-7 days. When changing, it is installed in another nostril. Sometimes a permanent nasogastric tube causes irritation of the mucous membrane with a large amount of secretion. In such cases, the tube is inserted through the mouth and removed after each feeding. For premature babies who are not heavy at birth, tube feeding is used continuously at certain intervals or

at a constant rate. With intolerance to feeding through a gastric tube in premature babies, a nasojejunal tube can sometimes be used successfully. However, when feeding through it, there is a risk of intestinal perforation. When the baby is strong enough, they switch to feeding through the breast, and then to the breast.

Feeding through a gastrostomy tube is used only in newborns who have undergone surgery for diseases and defects of the gastrointestinal tract and in cases of central nervous system damage with persistent swallowing disorders. When should enteral nutrition be started for premature infants? There is no consensus on this issue regarding premature patients. The so-called trophic feeding is the introduction of very small amounts of milk or formula to stimulate the maturation of the digestive tract. According to numerous reports, this has a beneficial effect: it accelerates growth, increases intestinal motility, reduces the need for parenteral nutrition, reduces the frequency of episodes of infection and shortens the duration of hospitalization. After the child's condition stabilizes, small amounts of enteral nutrition are started in addition to parenteral nutrition. Gradually, the volume of enteral nutrition in premature infants increases, and parenteral replaces it. This approach reduces the incidence of necrotizing enterocolitis. However, be very careful when increasing the amount of enteral nutrition. Careful introduction of enteral nutrition reduces the risk of hypoglycemia, dehydration and hyperbilirubinemia without increasing the risk of aspiration, therefore, at present, respiratory failure and a number of other conditions are not considered indications for a complete replacement of enteral nutrition with parenteral. With a mild general condition and a lively sucking reflex, you can immediately try to start feeding through the breast. However, premature infants with a birth weight of less than 1500 g often require tube feeding, since their breathing, sucking and swallowing are not yet sufficiently coordinated. Peristaltic sounds during auscultation, the release of meconium, the absence of an abdominal cavity, bile-stained substances in the stomach contents during vomiting or aspiration through a tube F CT indicate readiness to assimilate nutrition. Children weighing less than 1000 g are fed breast milk diluted in a ratio of 1 or 2 or a mixture for feeding premature babies at a rate of 10 ml / kg per day, which is administered continuously or in portions every 1-3 hours through a nasogastric tube. 10-15 ml / kg (not more than 20 ml / kg per day). When reaching a volume of 150 ml / kg per day, the calorie intake is increased to 24-27 kcal per 30 g of body weight. With high calorie intake, the risk of dehydration, lactose intolerance, flatulence, diarrhea, delayed gastric emptying and vomiting increases. Intravenous fluid is needed until the amount of feed reaches 120 ml / kg per day. For premature babies with a birth weight of more than 1500 g, initially 20-25 ml / kg of undiluted milk or a mixture for feeding premature babies are given per day, the volume increases in the following days, but should not exceed 20 ml / kg per day.

Formulas contain sufficient amounts of vitamins for proper growth, but it often takes several weeks for a child to consume this amount. Therefore, premature infants need vitamin supplements. Usually, they are based on the daily needs of a full-term baby, since the needs of premature infants are not exactly known. The need for some vitamins is increased in premature newborns. Thus, vitamin C is involved in the metabolism of

phenylalanine and tyrosine, and the absorption of other fat-soluble vitamins and vitamin D of calcium is reduced due to insufficient absorption of fats and their loss with feces. Premature children are prone to rickets, but vitamin D intake should usually not exceed 1500 IU / day. Folic acid is essential for DNA formation and cell proliferation. In premature infants, its level in serum and erythrocytes decreases in the first weeks and remains low for 2-3 months, so its supplementation is considered necessary, although it does not have a clear beneficial effect on growth and hemoglobin levels. Vitamin E deficiency is rare, but is accompanied by increased hemolysis and leads to premature infants, especially in severe cases. As an antioxidant, vitamin E prevents the peroxidation of highly polyunsaturated fatty acids of erythrocyte membranes. The need for it increases due to the increased content of these acids in the membranes when feeding mixtures containing them to term infants. The addition of vitamin A reduces the risk of BPD in premature infants.

In premature infants, physiological anemia is present in the postpartum period due to inhibition of erythropoiesis, and due to insufficient accumulation of iron in the prenatal period and faster growth than in full-term infants, a sharp increase in blood volume, due to which a decrease in hemoglobin levels manifests itself earlier and more significantly. However, even in premature infants, until they double their body weight or start receiving spectropoietin when there is a need for iron supplementation (2 ml / kg / day), the body has enough iron. With proper nutrition, infants have stools 1-6 times a day, their consistency is semi-liquid. Some deviations from the accepted stool frequency should be alarming, but not watery stools or the appearance of obvious or hidden blood in them, as well as the appearance of abundant regurgitation or vomiting. Usually, a premature baby shows anxiety shortly before feeding, and after feeding he calms down and falls asleep.

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