osmotic diuresis. In addition, especially in risky pediatric patients, hyperglycemia may cause cerebral ischemia. The aim of this study was to determine ideal glucose containing maintenance solution for maintaining normoglycemia in infants.

Materials and Methods: After obtaining Ethical Committee approval and informed consent from parents, 96 infants aged between 0 to1 years undergoing major pediatric surgery were included into the study. Patients were randomly divided into three groups according to maintenance fluids before anesthesia induction (Group I: 10% Dextrose+ ringer laktate, Group II: 5% Dextrose+ ringer laktate, Group III: 2.5% Dextrose +ringer laktate). Blood glucose levels were determined by glucometer (Optium Xceed, Abbott, UK). If hyperglycemia (blood glucose level > 200 mg/dL) or hypoglycemia (blood glucose level < 40 mg/dL for neonate or < 50 mg/dL for infants) was observed, routine protocols were applied to provide normoglycemia. Hemodynamic parameters were also recorded throughout the study period. Descriptive variables were analyzed using Mann-Whitney U test and chi-square test as appropriate.

Results and Discussion: Groups were comparable with respect to demographic data and duration of anesthesia and surgery. Blood glucose levels were similar between groups. However, hyperglycemia was observed 47 % in Group I, 19% in Group II and 25% in Group III, ($p < 0.05$). Hypoglycemia was observed only in one patient in Group I. Hemodynamic parameters were similar between groups. The risks of hyperglycemia and hypoglycemia during intraoperative period are well known for pediatric patients and have been evaluated in various studies. However, the ideal glucose concentration of maintenance fluid have not been defined yet. Therefore, especially in children at increased risk for intraoperative blood glucose derangements, frequent blood glucose monitoring is recommended.

Conclusion(s): We concluded that maintenance solution with 5 or 2.5 % glucose seems to be an appropriate choice for infants undergoing major pediatric surgery.

10AP2-6

Clinical sedation and bispectral index in burn children receiving gamma-hydroxybutyrate

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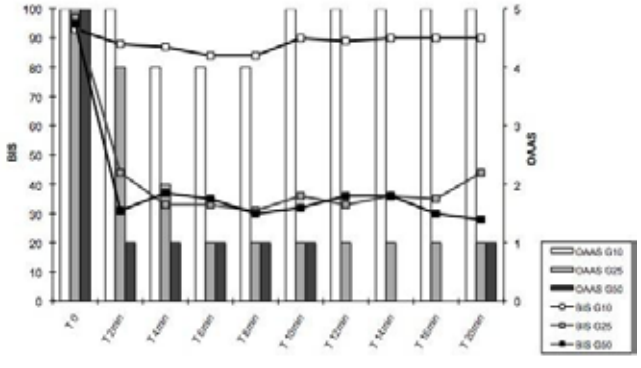
Background and Goal of Study: Gamma-hydroxybutyrate(GHB) may be an interesting hypnotic agent in burn patients because of its good respiratory and hemodynamic tolerance. Its clinical and electroencephalographic (EEG) sedative effects are not yet described in children. The aim of this randomized study was to assess clinical and EEG effects (using Bispectral Index(BIS)) of increasing intravenous(IV) doses of GHB in burn children requiring daily sedation for burn wound cares.

Materials and Methods: 36 children were randomly assigned into 3 groups according to the GHB IV dose received before wound care: respectively 10, 25 or 50mg/kg in groups G10, G25 or G50. All children received oral premedication (hydroxyzine 0.5mg/kg and morphine 0.2mg/kg) 30 minutes (min) before. Respiratory rate, pulse oxymetry and BIS were continuously monitored. Depth of sedation was clinically evaluated using OAAS Score every 2 min until recovery (i.e. OAAS=4). Side effects were noted. Comparisons of medians (expressed with interquartile ranged [Q1-Q3]) were performed using Kruskal Wallis test. A p value < 0.05 was considered significant.



[BIS and OAAS values over time]

Results and Discussion: Median age was 17,5 [12-34] months. Whatever the dose, BIS decreased after IV GHB. Nadir value of BIS was significantly lower in G25 and G50 than in G10 (respectively 27[23-29], 22[17-27] versus 72[64-85]), as for OAAS score (respectively 1[0-2], 0[3-5] versus 4[3-4]). Nadir values of BIS and OAAS were reached after similar delays, for BIS 7[5-9,5], 9[5-15] and 8[6-8,5] min respectively for G25, G50 and G10, and for OAAS score 7[5-14], 11[4-12] and 3[1,5-3] min respectively for G25, G50 and G10. Sedation duration was dose dependant :0 min [0-8] in G10, 46 min [35-53] in G25 and 105 min [72-131] in G50. No adverse events were noted.

Conclusion(s): BIS decreased after GHB injection and was correlated with OAAS score. Safe deep sedation can be achieved with IV doses of 25 or 50 mg/kg but the last dose was associated with prolonged duration of sedation.

10AP2-7

Analysis of ESPEN guidelines on lipid and carbohydrate needs estimation in neonates

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Background and Goal of Study: Lipids and carbohydrates are the sources of nonprotein energy (NPE) in nutrition therapy. It is extremely important in neonates to coordinate lipid and carbohydrate components of NPE in specified proportion. There are also strict limits on lipid and glucose dosage that should be fulfilled necessarily in order to minimize complications. The goal of the study is to analyze relations between lipid and glucose doses at different values of NPE and to develop practical algorithm taking into account all ESPEN restrictions and guidelines on estimations of NPE, its components and corresponding lipid/glucose doses.

Materials and Methods: The study methods include mathematical analysis of linear equations system and graphical visualization of its solutions. Methods of mathematical modeling were also used to generate a set of real clinical conditions and to test the created algorithm that allows calculating lipid and glucose doses in patient-focused specified proportion.

Results and Discussion: NPE value (kcal/24h), calculated or specified, consists of 2 components provided by lipids and carbohydrates. The NPE value should be constant while doses of lipids and carbohydrates may change during therapy. If NPE value is constant lipid dose (LD) and dry glucose dose (GD) are functionally dependent and this relationship can be expressed with system of 2 linear equations. In these conditions increasing LD by 1 g/kg/24h requires decreasing GD by 2.25 g/kg/24h and if GD rises by 1 g/kg/24h LD should fall down by 0.44 g/kg/24h to preserve specified value of NPE. Each NPE value has its own minimal GD that often exceeds common recommended minimum. This specific minimum may be calculated by formula. The formula shows that minimal GD becomes higher with the increasing of NPE. To control glucose load the other 2 equations were developed. They connect glucose load with daily lipid dose. Using derived calculating schemes it is possible to define the conditions enabling to meet specified balance between 2 NPE components and not to break limits of daily LD and GD.

Conclusion(s): The analysis of ESPEN guidelines on PN in neonate with mathematical methods allowed developing easy practical algorithm for estimating neonate nonprotein energy, its lipid/carbohydrate components in balanced proportion and meet ESPEN restrictions on lipid and glucose dosage.

References:

ESPEN/ESPEGHAN Guidelines on paediatric parenteral nutrition.
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10AP2-8

Preoperative fasting in children: Impact of prior food on gastric emptying after drinking clear fluids - preliminary MRI data

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Background and Goal of Study: Gastric emptying half-life time in children after clear fluid intake was shown to be less than 30 minutes without prior food, i. e. after overnight fasting (1). The impact of prior food on gastric emptying half-life time and residual gastric contents volume at time of induction has to be examined.

Materials and Methods: After overnight fasting, healthy volunteers aged from 6 to 12 years had to drink 7 ml/kg of diluted raspberry syrup without (A) and 4 or 2 hours after breakfast (B / C) on three different days. Breakfast consisted of milk and cereals and was identical for a child on both occasions. Axial images covering the entire stomach were obtained by magnetic resonance imaging (MRI) after overnight fasting, immediately after drinking and then every 30 minutes for 2 hours. Gastric content volumes were determined in a blinded manner, related to body weight (GCV_w) and elimination half-life times ($T_{1/2}$) calculated. Data are presented as median (range). Exact significance p for