al Anesthesia & Neurological Disord

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Is General Anesthesia a toxic substance to the human being ???

General Anesthesia→neurodegenaration + global impairment in neonatal animals.

Histopathological changes from IV& inhalational anesthesia .

Combinations of drugs may cause more injury.

Regional anesthesia& narcotics are increasingly used in infants.

70% New onset negative behavioral changes in postoperative period

- Anxiety, enuresis, separation anxiety, night crying, fear of strangers……

20% have these behaviors for 6 mo after surgery

- Sleep quality also disturbed, results I further behavioral compromise.

Preoperative psychological preparation reduces the incidence of behavioral changes

Oral midazolam 0.5 mg/kg the night before operation has anexiolysis& amnesia effects.

General Anesthesia in Cerebral Palsy:

Cerebral Palsy:

- Dysfunctional swallow, ↑ salivation, GER
- Chronic pulmonary aspiration of gastric content.

- Ineffective gag& poor cough reflexes
- Reactive airway disease& recurrent pneumonia.

- 1/3 pts. Have seizures.
- Mention it to anesthesiologist.

General Anesthesia
n Epilepsy

Epilepsy and anesthesia:

- Anticonvulsant drug metabolism is altered perioperatively.
- Anticonvulsants may affect anesthesia metabolism.
- Maintenance of anticonvulsants postoperatively is important.

N.B.

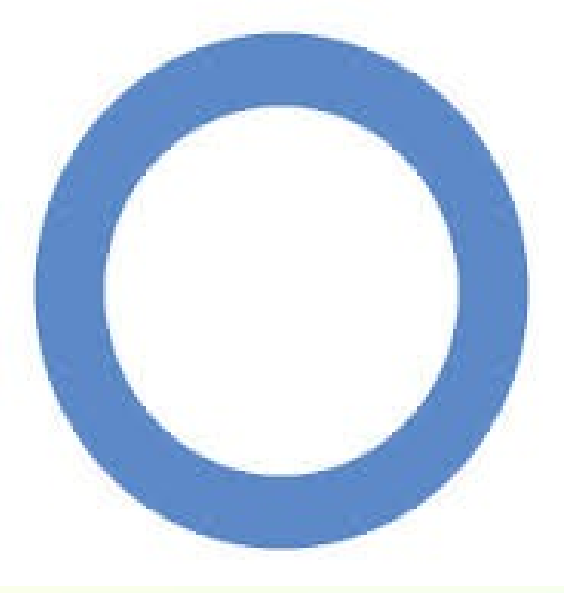
- Anticonvulsant serum level.
- CSF secretion is increased during surgery and general anesthesia.
- Patients with CNS diseases are not at increased risk for malignant hyperthermia.

Anesthesia & Endocrinology D

General Anesthesia in *Diabetes Mellitus*

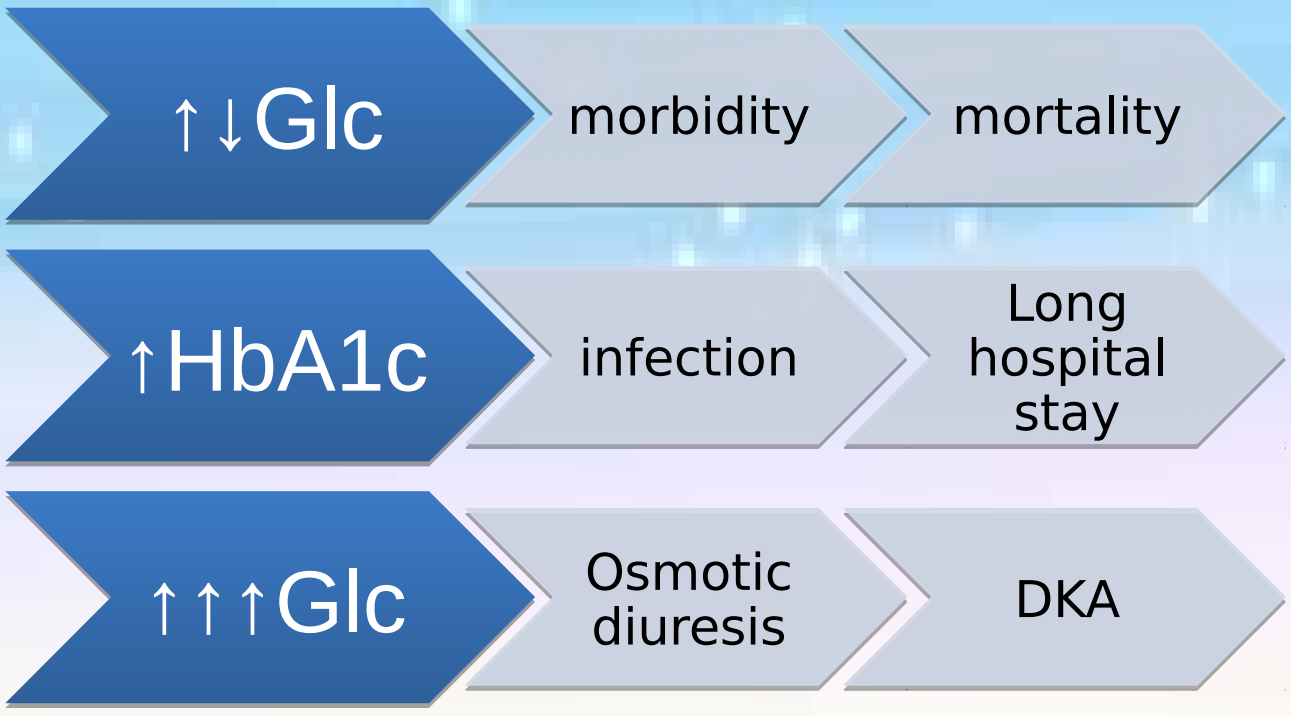
Type I

Type II



- What are the suspected complications? 3
- What is most serious, acute or chronic hyperglycemia? 2
- What is most dangerous, hyper or hypoglycemia? 1

IDDM:


↑↓Glc
morbidity
mortality
↑HbA1c
infection
Long hospital stay
↑↑↑Glc
Osmotic diuresis
DKA

IDDM:

- Insulin regimen, S. Na, K, Ca, HbA1c, complications.
- Diabetic pt. should be the 1st one in OT.
- RBS should be measured on arrival to OT.
- RBS should be 100-200 mg/dl.
- If RBS> 250 mg/dl should be reduced.
- RBS should be checked hourly in OT.

Abstract

Pediatric patients with diabetes are managed with increasingly complex regimens. To optimally manage these patients during the perioperative period, pediatric anesthesiologists must carefully consider the pathophysiology of the disease, patient-specific methods of treatment, status of glycemic control, and the type of surgery proposed. Important pediatric issues, including body size, pubertal development, and ability to tolerate nil per os status, must be considered. To keep pace with the array of options for treating diabetes in children, the perioperative plan should be developed in consultation with a pediatric endocrinologist. We present an algorithm that was developed at Children's Hospital Boston for the management of pediatric patients with either type 1 or type 2 diabetes mellitus presenting for surgery and general anesthesia. This collaborative effort between the pediatric anesthesia and endocrine services represents one example of a standardized approach to these patients that should facilitate care and improve management. Differences from previously published recommendations are highlighted, as are expected changes caused by the continued evolution of pediatric diabetes care.

Management Recommendations for Diabetic Children on Insulin Injections for Procedures Requiring NO Insulin Infusion

Consider for any short procedure that will cause minimal change in oral feeding postoperativ

Patient Name: _____ DOB: _____

Date: _____ Expected Date of Surgery: _____ (Patient should be scheduled as first case.)

1. Recommendations for family for **insulin dosing the day before and the morning of surgery:**
   AM _____ Dinner _____
   *Children taking Lantus/Levemir should reduce evening dose by 10%.
   PM _____ Morning of surgery _____
2. Recommendations for family for **oral agents** day before and morning of surgery.
   PLEASE NOTE: Metformin (Glucophage) must be discontinued 48 hours before surgery and any procedures using contrast dye.
3. The patient should follow preoperative feeding instructions provided by surgical staff.
4. Obtain blood glucose on arrival.
   If hyperglycemic, consider administering Humalog/Novolog insulin to correct hyperglycemia. Usual subcutaneous correction factor for this patient: 1 unit Humalog/Novolog corrects blood sugar ___ mg/dL
   Consider canceling or postponing surgery if blood glucose is over 400 mg/dL **AND ketones are in urine**
5. Check blood sugars hourly perioperatively.
   If blood sugar is over 300 mg/dL: Consider touching up with Humalog/Novolog.
   If blood sugar is below 80 mg dL: Consider 2 cc/kg D10W (if NPO) or 15 g of carbohydrate (by mouth).
6. Dip all urine for ketones.
7. Call Endocrine Fellow in case of ketones, vomiting, or persistent low blood sugars (<80 mg/dL).
8. Allow child to ingest fluids or food postoperatively per surgical protocol. When child is tolerating oral food and liquids, the family may resume home insulin regimen. Begin subcutaneous insulin at mealtime if poss

lin Regimen for Procedures Lasting Less Than 2 Hours

Day of procedure	Day before procedure	Insuli n
50% of intermediate	Usual	Mixed
No	Usual	Short
No insulin Full dose	Usual night before but not after	Long
Usual	Usual	Pump

Management Recommendations for Diabetic Children on Insulin Injections for Procedures Requiring Insulin Infusion

Consider for any procedure that is long in duration or may interfere with oral feeding after surgery

Patient Name: _____ DOB: _____

Date: _____ Expected Date of Surgery: _____

1. Recommendations for family for **insulin dosing** day before and morning of surgery:
   AM _____ Dinner _____*Children on Lantus should reduce the evening dose by 10%.
   PM _____ Morning of surgery **HOLD MORNING INSULIN**
2. Recommendations to family for **oral agents** day before and morning of surgery.
   PLEASE NOTE: Metformin (Glucophage) must be discontinued 48 hours before surgery and any procedures using contrast dye.
3. The patient should follow preoperative feeding instructions provided by surgery.
4. Obtain blood glucose on arrival.
   Consider canceling or postponing surgery if blood glucose is over 400 mg/dL **AND any ketones are in urine**.
5. Begin insulin infusion and D10W by intravenous route simultaneously. Insulin infusion should be started before 8 AM, and at least 2 hours prior to beginning of the surgical procedure.
6. Initial intravenous insulin infusion recommendations for this patient:
   10% dextrose with electrolytes at maintenance levels
   Regular insulin at 0.02-0.05 units/kg/hr as detailed below:
   Select 0.02 units/kg/hr if blood sugar is 80-200 mg/dL at beginning of infusion.
   Select 0.02 units/kg/hr if child received Lantus insulin the night before.
   Select 0.03 units/kg/hr if blood sugar is 200-300 mg/dL.
   Select 0.04 units/kg/hr if blood sugar is 300-400 mg/dL.
   Select 0.05 units/kg/hr if blood sugar is >400 mg/dL at beginning of infusion.
7. Check blood sugars hourly while on insulin infusion. Titrate infusion (by increments of 0.01 units/kg/hr) and intravenous fluids to keep blood glucose levels 80-180 mg/dL.

sulin Regimen for Long Lasting Procedures:

	insulin	RBS
DW 10% Maintenance Electrolytes Insulin infusion	0.02 units/kg/hr	80-200
	0.03 units/kg/hr	200-300
	0.04 units/kg/hr	300-400
	0.05 units/kg/hr	>400

neral Anesthesia in Hypothyroidism

GA in Hypothyroidism

Complete supplementation of 2 wks levothyroxine

- Undertreated pt. has multisystem disease

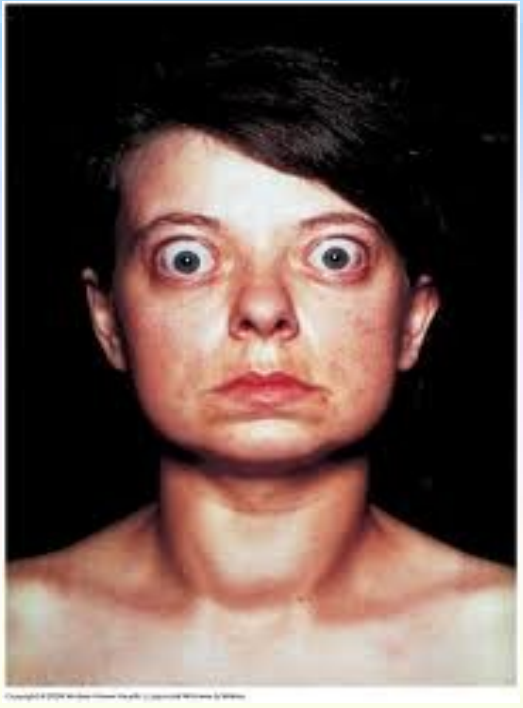
Measure 8 AM cortisol level

- Search for occult adrenal insufficiency

Pt. should take his drug day of surgery

Even Levothyroxine ½ is 7 days

neral Anesthesia in Hyperthyroidism

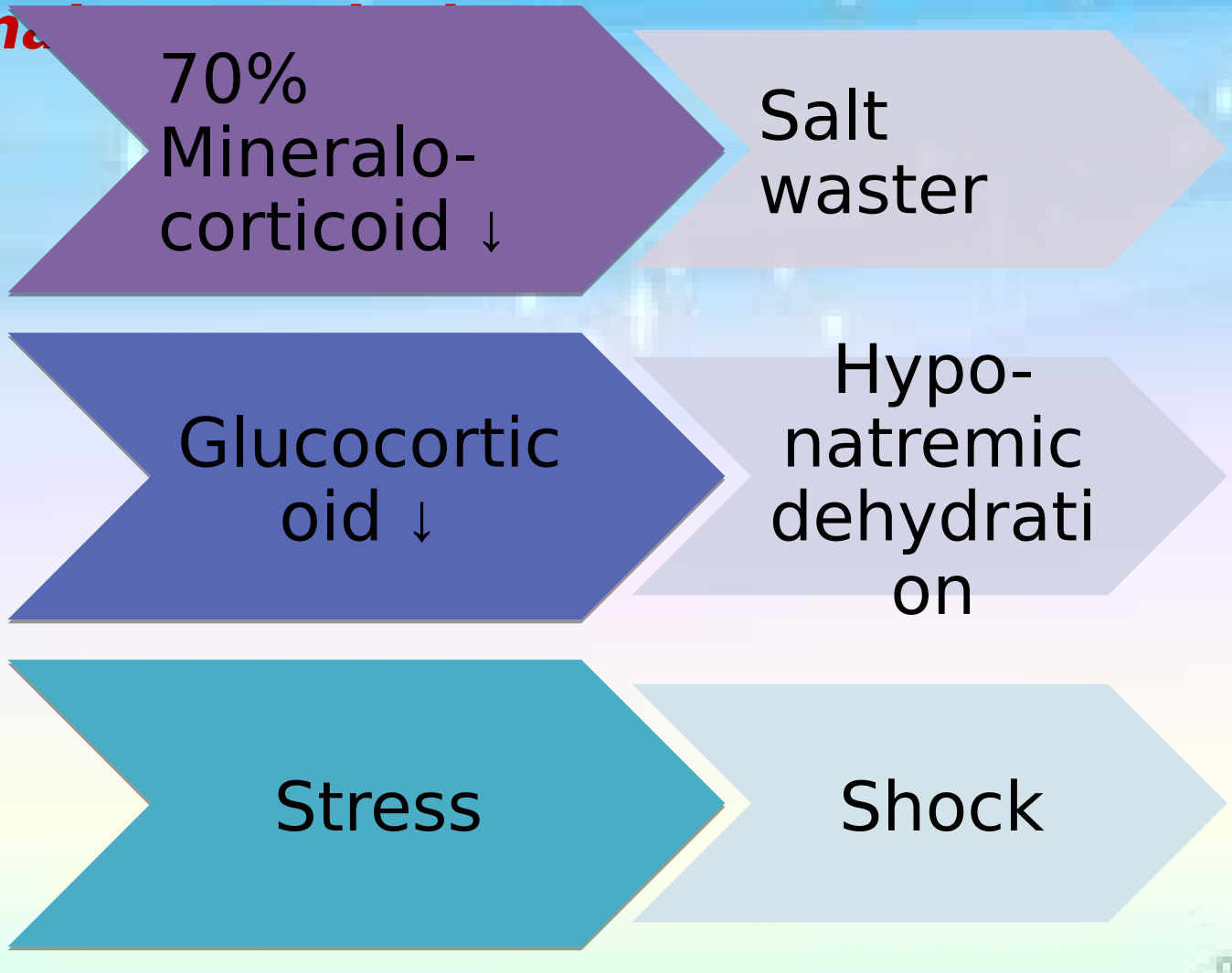


GA in Hyperthyroidism:

- Pt. can has CHF + severe respiratory distress
- Pt. can has thyroid storm& malignant hyperthermia like S&S. adrenal reserve is limited as well.
- Steroids can block conversion of T3 to T4, so, it improves outcome in thyroid storm
- β-Blockers is titrated to restore child's HR to his normal for age

General Anesthesia in Adrenal Hyperplasia: Congenital Secondary

GA in Congenital Adrena



GA in Congenital Adrenal Hyperplasia

- Hydrocortisone at 10 to 20 mg/m^2 in 3 divided doses is administered to provide physiological glucocorticoid coverage and to suppress adrenocorticotropic

- Salt-wasting patients require fludrocortisone (Florinef) and sodium chloride supplementation.

- Patients scheduled for major surgery are given 100 mg/m^2 hydrocortisone in 4 divided intravenous doses for the first 24 hours and then tapered slowly.

GA in Secondary Adrenal Hyperplasia

If the pt. developed hypotension, it is due to glucocorticoid deficiency only.

atients on steroids

atients on steroids

Situations in Which *Stress-Dose* Steroid Coverage is Necessary

- <10 days after a burst 5 days steroid
- < 30 days after last completion of the last multiple short courses of steroids
- < 1 year after prolonged course steroid >3 mo
- Previously treated with fluticasone > 500 mcg/dl
- Daily parenteral or enteral steroids > 3 wks
- Evening steroid doses

Stress-Dose Steroid Recommendations

DOSE	DEGREE OF SURGICAL STRESS
Hydrocortisone 25 mg/m^2 IV Methylprednisolone 5 mg/m^2 IV	Minor: <1 hr (eg, hernia)
Hydrocortisone 50 mg/m^2 IV Methylprednisolone 10 mg/m^2 IV Or usual oral dose and reduced parenteral dose	Moderate: extremity surgery
Hydrocortisone 25 mg/m^2 IV every 6 hr* Methylprednisolone 5 mg/m^2 IV 6 hr* Wean over 1-3 days	Major: laparotomy

References:

Textbook of Nelson
Textbook of American Academy of Pediatrics
Medescape


Thank You