

GLUCOSE

Introduction

Symptomatic hypoglycaemia resulting from drug toxicity requires immediate correction with glucose.

This will usually be by IV administration, unless the hypoglycaemia is very mild.

Preparations

There are numerous glucose containing fluid preparations. The most commonly used include:

Preparation	Concentration gms/ 100mls	Concentration gms/ 1ml	Total amount of glucose
Dextrose 5% 1000 mls	5 gms /100 mls	0.05 gms / ml	50 grams
Dextrose 10% 1000 mls	10 gms / 100 mls	0.1 gram / ml	100 grams
Dextrose 50% 50 mls	50 gms / 100 mls	0.5 grams / ml	25 grams

Indications

1. Symptomatic hypoglycaemia of any cause.
2. Toxicological indications:
 - Drug induced hypoglycaemia:

Examples include:

- ♥ Insulin

- ♥ Sulfonylurea
- ♥ Ethanol, (primarily in children)
- ♥ Propranolol
- ♥ Quinine
- ♥ Salicylate
- ♥ Valproate
- Insulin-dextrose euglycaemia therapy:
 - ♥ Calcium channel blocker overdose
 - ♥ Beta-blocker overdose, (indication less clear)
- Hyperkalemia:
 - ♥ In conjunction with a short acting insulin

Contra-indications

- There are no absolute contra-indications to the administration of glucose.

Precautions

- Glucose for any hypoglycemia is mandatory and potentially life saving. Note however that 50% glucose can worsen neurological outcomes in patients with ischemic cerebral injury; ² hence a finger prick glucose level to confirm hypoglycemia is best done, if possible prior to its administration.
- 50% glucose is best avoided in children

Adverse reactions

Potential adverse reactions include:

- Hyperglycaemia
- Hyperosmolality
- Hypokalemia, with larger doses and hyperinsulinaemic states or with ongoing infusions of glucose.
- Thrombophlebitis from extravasation.

Dosing

Correction of hypoglycaemia:

- **Adults:**
 - ♥ In adults **give 50mls of 50% dextrose (i.e. 25 grams) IV**
 - ♥ Dose can be repeated as necessary.
 - ♥ Infusions:
 - ♥♥ **Glucose 10%, at 250 mls per hour, (i.e. 25 grams per hours) and then titrate as required.**
- **Children:**
 - ♥ **Glucose 10% 2-5 ml/kg bolus IV** is preferred for children.²
 - ♥♥ The excessive use of glucose 50% has caused deaths in children due to hyperosmolality.
 - ♥ Dose can be repeated as necessary.
 - ♥ Infusions:
 - ♥♥ Don't use dextrose concentrations above 10% for acute management.³
 - ♥♥ After IV bolus, an infusion can be run at **2-5ml/kg/hr of 10% dextrose** to maintain BGL above 4.0mmol/l. Aim for BGL between 4.0-8.0mmol/l³

See separate guidelines for the following specific scenarios:

- Insulin-dextrose euglycaemia: calcium channel Blocker overdose guidelines.
- Insulin overdose
- Sulfonylurea overdose

References

1. Glucose in L Murray et al. Toxicology Handbook 2nd ed 2011.
2. Emergency Therapeutic Guidelines, 1st ed 2008.
3. Hypoglycaemia: RCH Clinical Guidelines, Website.

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