OPTIMIZED SUPPORT CARE FOR PATIENTS WITH EBOLA VIRUS DISEASE (EVD)

HYPOGLYCEMIA

OBJECTIVES

At the end of this presentation, you will be able to:

- Know the importance of managing severe hypoglycemia,
- Know how to treat severe hypoglycemia taking into account the differences between children and adults

Questions

- What are the clinical forms of severe hypoglycemia?
- Rapid assessment and Clinical Management
- Physical examination
- History of the disease
- Antecedents
- Laboratory examinations

- ✓ Patient confused, in a coma and / or with convulsions and blood sugar measurement not possible?
- ✓ Is there severe hypoglycemia (<54 mg / dL or <3 mmol / L)?

Management of severe Hypoglycaemia

- What is the best glucose solution for treating severe hypoglycemia?

D50	**25 gr de glucose**	**50 mL fluid**
D10	**10 gr de glucose**	**100 mL fluid**
D5	**5 gr de glucose**	**100 mL fluid**

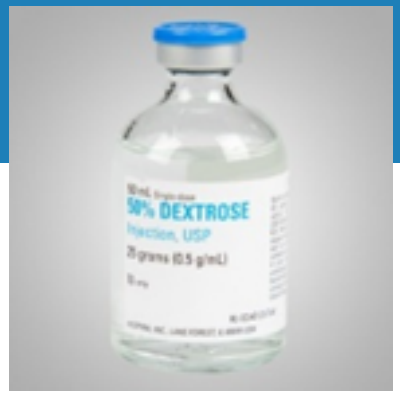
Severe Hypoglycemia in Children

- **Use D10%**
  - Avoid D50: avoid acute hyperglycemia, that causes hypoglycemia rebounds.
- **Bolus IV : 2 mL/kg de Dextrose 10% slowly**
  - Slowly to avoid acute hyperglycemia, which may cause rebound hypoglycemia
  - Child - new recommendations - **2ml / kg of Dextrose 10%**
- **Then start the maintenance infusion: 5 g / kg / day**

- In all patients with severe hypoglycemia to prevent the onset of a new episode of hypoglycemia.
- It is the “Dextrose” support that we will give if we use the “4-2-1 rule” for estimation of maintenance liquids with Ringer Lactate/Dextrose 5%
- Some patients need Ringer Lactate/Dextrose 10% like **Newborns** need approximately (**10g Dextrose / kg / day** = approximately 6-8 mg Dextrose / kg / min)

- **Check blood sugar again 15 minutes after correction.**
- **Schedule blood sugar monitoring for the next 12-24 hours**

Severe Hypoglycaemia in Adult



- **Use D50**
  - Diluted if possible
- **Bolus : 50 mL (25 gr) slowly in 1 min**
- Then start the maintenance infusion according to the following options:

- Ringer lactate / Dextrose 5% (or RL / Dex 10%)
- See the rule “4-2-1” or **25-30 ml / kg / day**
- Do not use hypotonic solutions

- **Check again in 15 min**
- **Plan the control of Glycaemia for the following 12-24h**

Severe Hypoglycaemia: Key points

- After the first bolus, check blood sugar again in 15 minutes.
- If the blood glycaemia is still very low, repeat the bolus and adjust the maintenance IV fluids.
- Check blood sugar again every hour until it normalizes (> 80 mg / dL) in 4 measurements, then space out the frequency of checks every 4 hours.
- Adapt the infusion of the maintenance liquids.
- Gradual introduction of liquids by enteral route if possible and control blood sugar every 8 hours.

Severe Hypoglycemia: Key points

- Do not use D5 to treat severe hypoglycemia: Glucose concentration is too low

- Risk of administration of too much free water -> risk of hyponatremia.

- After initial control of hypoglycemia - immediately start infusion of maintenance fluids with Ringer Lactate/ Dextrose to prevent re-hypoglycemia.

- Use Ringer Lactate/ Dextrose - an isotonic solution!

Maintenance fluids

Adults: normally an adult with no fever, need of fluids of **25-30mL/Kg/day** (1.5-2 L/d)

Weight (kg)	ml/hr	ml/day
4	16	400
5	20	500
6	24	600
7	28	700
8	32	800
9	36	900
10	40	1000
12	44	1100
14	48	1200
16	52	1300
18	56	1400
20	60	1500
22	62	1550
24	64	1600
26	66	1650

0- 10kg	**100ml/kg/day**	**or**	**4ml/kg/h**
11-20kg	**50ml/kg/day**	**or**	**2ml/kg/h**
> 20kg	**25ml/kg/day**	**or**	**1ml/kg/h**

This is only an estimate.

Reduce maintenance fluids under certain conditions:

- Neurological conditions
- Respiratory distress
- After blood transfusion

See specific sections for: acute renal failure, heart failure, diabetic ketoacidosis, etc.

Holliday & Segar, 1957, Pediatrics

HEALTH EMERGENCIES programme

Maintenance fluids: Dextrose 5%

Liquides: No hypotonic!! "Electrolyte-balanced"

- Manual preparation: RL + Dextrose

450 ml RL + 50 ml de D50%

Remove
- 50 ml
of RL

Add
+ 50 ml
of D50 %

- **0.9% NaCL – Last choice**

DEXTROSE 5% / RINGER LACTATE		GLUCOSE 5% / RINGER LACTATE
DINFDERI5FBF5	DEXTROSE 5%/ RINGER LACTATE , 500ml, flex. bag, PVC free GLUCOSE 5%/ RINGER LACTATE, 500 ml, poche souple, sans PVC	WHO Class: 26.2 STERILE
Synonym: glucose 5% / ringer lactate		*Synonyme: dextrose 5% / ringer lactate*

Maintenance fluids

If need RL/Dextrose 10%

Manual preparation: RL/Dextrose 10%

400 ml RL + 100 ml de D50%

Remove
- 100 ml
of RL

Add
+ 100 ml
of D50 %

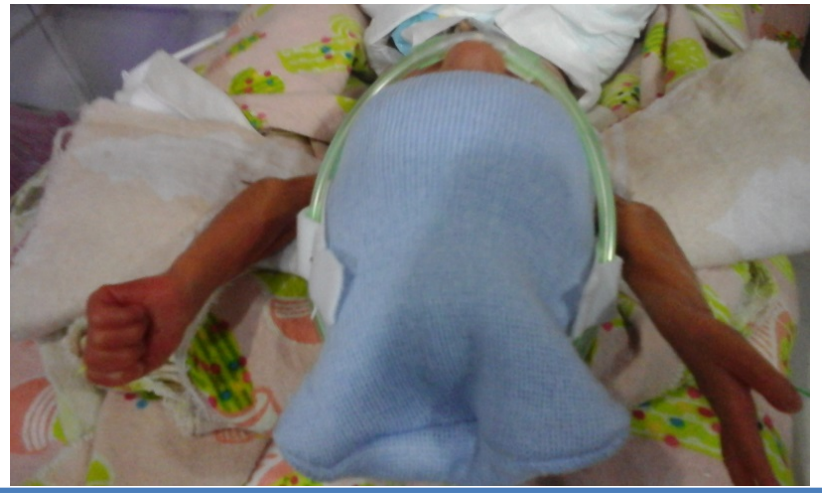
DEXTROSE 5% / RINGER LACTATE		GLUCOSE 5% / RINGER LACTATE
DINFDERI5FBF5	DEXTROSE 5%/ RINGER LACTATE , 500ml, flex. bag, PVC free GLUCOSE 5%/ RINGER LACTATE, 500 ml, poche souple, sans PVC	WHO Class: 26.2 STERILE
Synonym: glucose 5% / ringer lactate		*Synonyme: dextrose 5% / ringer lactate*

Si RL+Dex 5 % "500ml" is available:
Remove 50ml and
Add 50 ml of D50 % to 500ml of RL+D5%

Administration of IV fluids for children and newborns

Huge liquid bag for a small child

NO!!!!!



Pediatric perfusion system

Use use pediatric infuser for children:

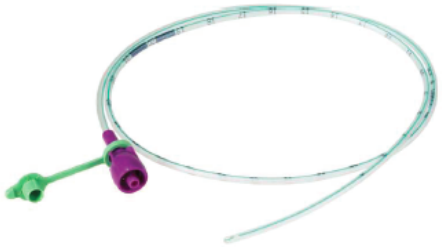
- 60 drops / ml

- Example:
  - 40ml / hour = 40 drops / min
  - The equivalent of fluid required for 2-3 hours can be placed in the reservoir.
  - Filling continues after each of these temp intervals.
- Or
  - IV filling
  - Administration of certain drugs

Nutrition of the patient in critical condition – Example - child nutrition

- Structured approach to the introduction of enteral nutrition of children in a critical state: Malnourished and non-malnourished child
- Safe feeding practices (NGT risk of bleeding)

- Correct equipment
- Monitoring & documentation
- Training
- Importance of caregiver



Summary

- Early identification and treatment of patients with severe hypoglycemia saves lives.
- Give emergency boluses of either D10 (child) or D50 (adult) to treat severe hypoglycemia urgently and start maintenance therapy at the same time.
- Reassess the situation frequently to prevent the occurrence of complications such as seizures, coma and death.
- Initiate oral feding as soon as possible

Questions?