

Hypoglycaemia in newborn infants and children



Objectives

- Define hypoglycaemia
- Learn how frequently it occurs
- Learn which groups are most affected
- Consider its treatment
 - Emergency Correction
 - Safety
 - Early management

How to define hypoglycaemia

Less than 45mg/dl (2.5mmol/L)

BUT

- Healthy term newborn infants tolerate lower levels well and will need feeding rather than iv glucose
- Children with severe malnutrition are very prone to hypoglycaemia and need urgent treatment or feeding

Use glucose test strips for quick result but check result in laboratory if possible

Which newborns are likely to be hypoglycaemic?

Any baby who has:

Fitting

Reduced consciousness

Lethargy

Also babies who are:

Small for dates

Low birth weight

Infants of diabetic mothers

Following asphyxia

Unable to feed

Jittery babies

How common is it?

- Amongst all children admitted to hospital
 - Approximately 8% or 1 in 12
- In neonates who are sick
 - Approximately 20% of sick infants aged < 7 days
- In severe malaria
 - Between 7 and 30% in African series

Why do we worry about it?

Associated with

- increased mortality
- convulsions
- permanent brain injury

When and how do we treat?

- There are **no reliable** signs of hypoglycaemia
- Blood glucose should be measured in all severely ill newborns and children
- If rapid measurement is not possible it is appropriate to **treat with a bolus 10% dextrose** if :
 - Altered consciousness
 - Inability to drink / breastfeed



Neonatal period

- Babies who can breast feed do not need iv treatment – they need continued, improved feeding if the blood glucose is low – if necessary with a nasogastric tube (ngt).
- They do NOT need oral glucose powder

Note: the management of babies of diabetic mothers is not covered here

Newborn baby with no symptoms of hypoglycaemia

Blood glucose 25--45mg/dl (1.4--2.5mmol/L)

Breast feed or expressed milk by cup/ spoon

Monitor glucose after 3 hrs or before next feed

>45mg/dl

25--45mg/dl

<25mg/dl

Check 3 hourly

Incr frequency of feeds

Change to iv

Newborn baby with symptoms of hypoglycaemia or glucose <25mg/dl

Blood glucose 25mg/dl

2ml/kg Bolus of 10% dextrose iv over 5 minutes

Set up infusion 10%glucose daily maintenance rate

Monitor glucose after 3 hrs or before next feed

25--45mg/dl

Continue infusion, incr feeds
Reduce infusion slowly when
glucose >45mg/dl x2

<25mg/dl

Give second bolus
Continue infusion

Never stop a glucose infusion suddenly

Infants and children

Suspect hypoglycaemia in...

Any child who has:

Fitting
Reduced consciousness
Lethargy

Also when a child has:

Malaria if severe
Malnutrition
Unable to drink
Presents with an
emergency sign

Very sick children

Check blood glucose in any sick child who has not been eating normally

If below 45mg/dl (2.5mmol/L)

In young infants:

give 2ml/kg 10% glucose iv

In children and older infants:

give 5ml/kg 10%

Continue with feeds or iv infusion

Hypoglycaemia in malaria

Contributory factors

- Severely ill patients will not have eaten for some time
- The malaria parasite consumes glucose
- Quinine increases risk of developing hypoglycaemia after admission

Children receiving iv / im quinine should also receive maintenance fluids with glucose and be fed as soon as possible.

Severe malnutrition

If a seriously malnourished child presents with shock use:

Half strength Ringers/saline in 5% dextrose as the resuscitation fluid

Start feeding as soon as possible

Keep warm

Severe malnutrition

All malnourished children are at risk of hypoglycaemia

Measure glucose if possible but....

If child is lethargic, unconscious or convulsing

Give glucose 10% 5ml/kg iv PLUS 50ml 10% by NG tube

Start feeding as soon as possible

Keep warm

Severe malnutrition

If the child is not lethargic or convulsing

Do not give intravenous fluids

Feed as quickly as possible:

F75 starter feed (75cals per 100ml)

If not immediately available give 10% glucose or sugar solution (4 rounded teaspoons in 1 cup water)

Feed 2 hourly day and night

Monitor temperature and glucose (aim for >60mg/dl)

Aim to keep blood glucose > 60mg/dl

Giving 50% glucose is NOT recommended

- There have been case reports of dextrose overdosing resulting in convulsions, and death (*hyperosmolar brain injury*)
- In newborns it has been suggested that use of 50% dextrose increases the risk of damage due to asphyxia.
- 10% solutions work just as well and are safer.

Making 10% dextrose

10% dextrose at 5mls/kg given over 2 - 3 mins.

To make up 10% dextrose

- Using water and 50%

4 parts water for injection

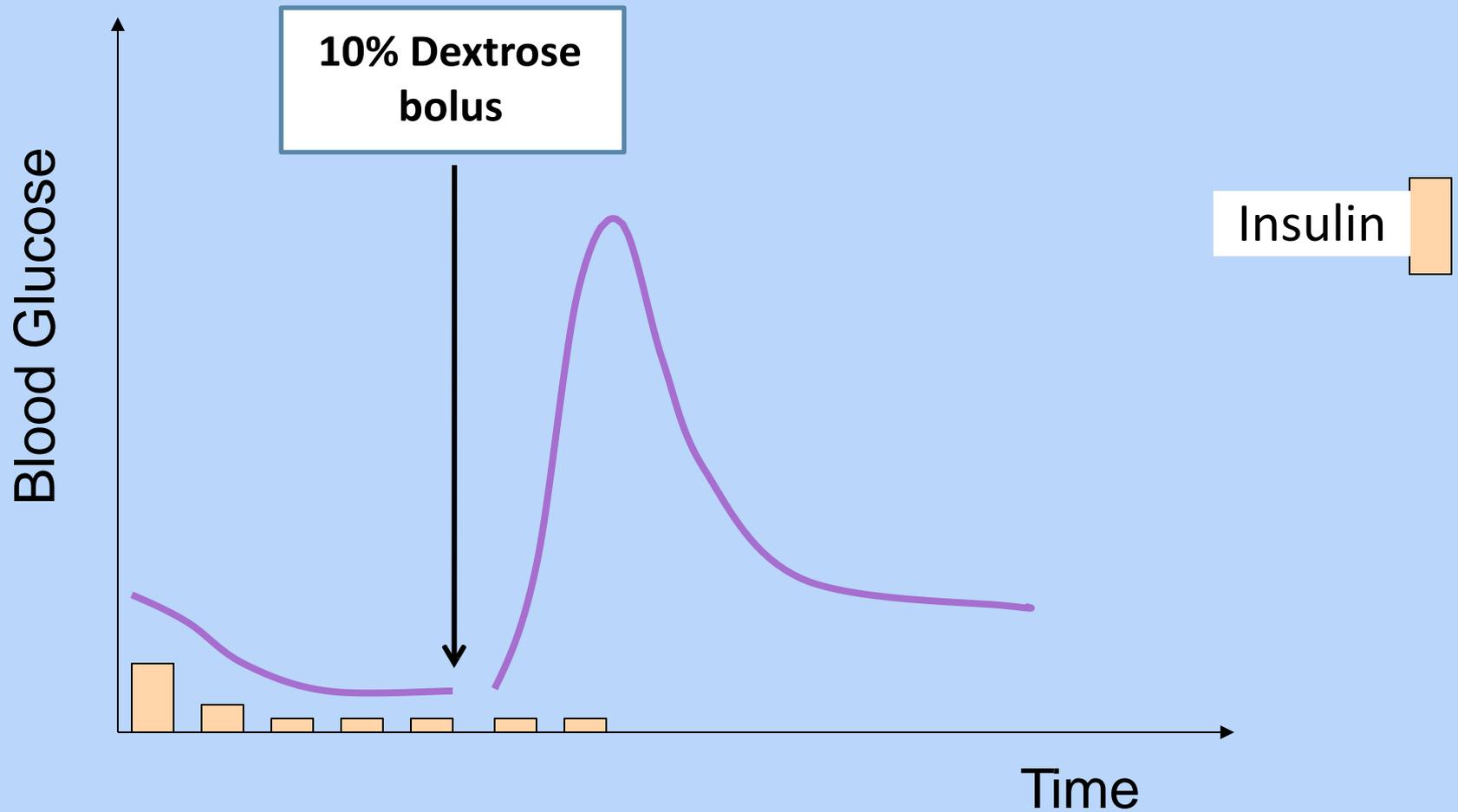
1 part 50% glucose

Using 5% dextrose and 50%

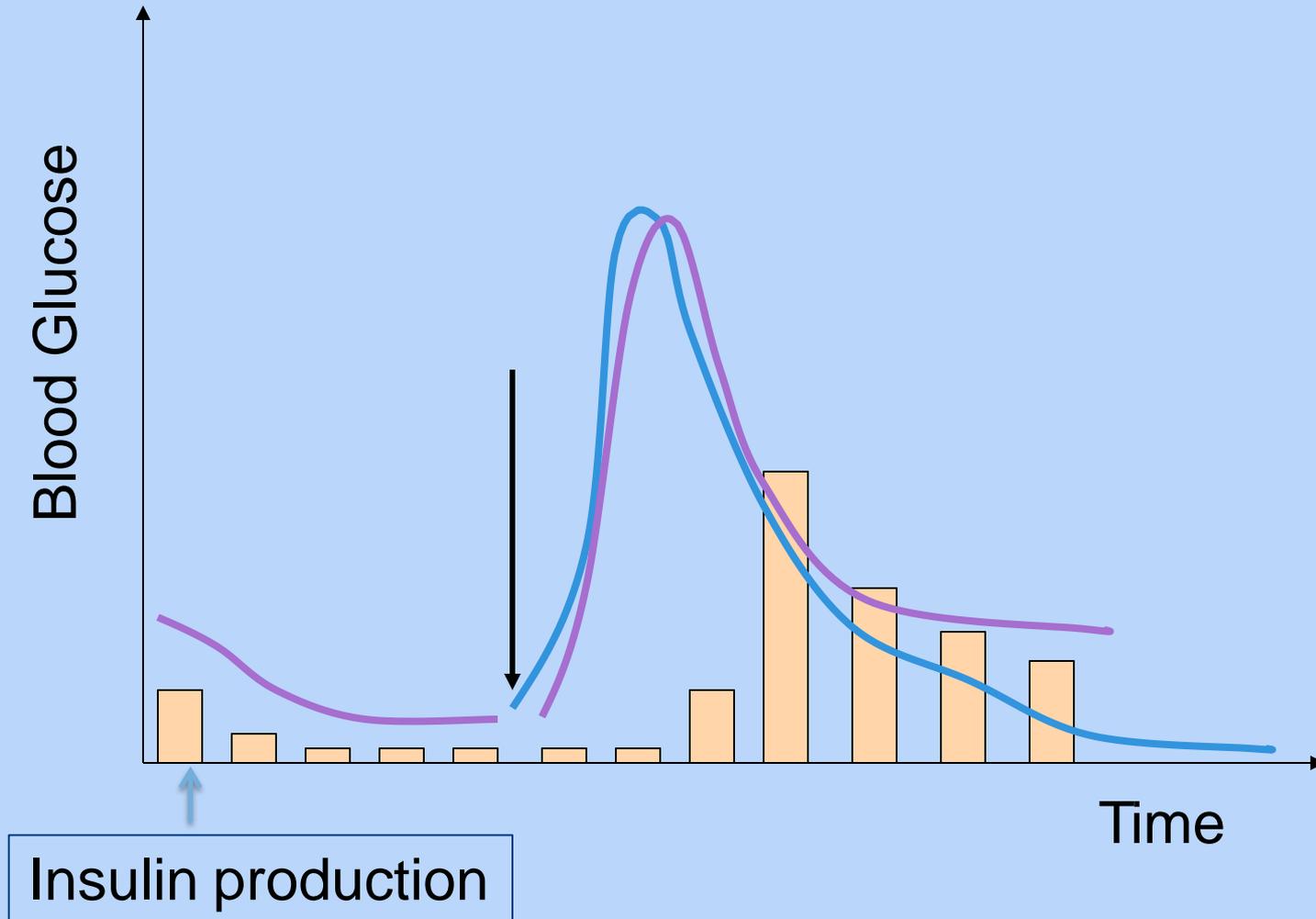
9 parts 5% Dextrose

1 part 50% Glucose

Rebound hypoglycaemia



Rebound hypoglycaemia



Maintenance therapy

After a bolus of glucose a plan must be made to continue glucose supply:

- iv fluids with dextrose and electrolytes
- Nasogastric or oral feed

Questions?

Summary

- Hypoglycaemia is common in very sick newborns and children; test for it.
- Treatment is a bolus of 10% glucose in the correct amount for the weight and age.
- To prevent rebound bolus glucose treatment must be followed by maintenance therapy.

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