Hypoglycaemia in Adults in the Community: *Recognition, Management and Prevention*

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Presentation content

- Statistics relating to hypoglycaemia
- Causes of hypoglycaemia
- Risk factors
- Signs and symptoms
- Treatment
- Strategies to avoid hypoglycaemia
- Summary

UK Hypoglycaemia Study (2007)

In a group with HbA1c 7-8%:

T2D on SU = T2D on insulin <2yr: severe hypos 7% p.a.

T2D on insulin >5yrs = T1D < 5yrs: severe hypos >20% p.a.

T1D > 15yrs, severe hypos 46% p.a.

- After 10-15 yrs of diabetes, 20-25% of T1D and up to 10% insulin treated T2D have impaired hypoglycaemic awareness, with 6x risk of severe hypoglycaemia. Diabetologia 2007, 50: 1140-1147

- Amiel, 2008, claims that >5000 people will experience a severe event resulting from SU therapy which requires emergency intervention.

ACCORD (2007) raised concerns that hypoglycaemia contributed to diabetic mortality….

- 16.2% -intensive treatment group experienced severe hypoglycaemia
- 3.3% death rate – higher in intensively controlled group (though not necessarily from hypoglycaemia)
- Unpublished data - excess mortality in ACCORD *WAS* attributable to hypoglycaemia.
- ? Causes - include dysrhythmias, hyperkalaemia, and cardiac ischaemia

Financial burden of hypoglycaemia

- The costs of severe hypoglycaemia are considerable. It has been estimated that the cost of emergency calls for severe hypoglycaemia amounted to **£13.6 million** in England alone (Farmer et al, 2012).

- Even if a hospital admission is not required, significant costs may still be incurred from paramedic service involvement.

Hypoglycaemia in type 2 diabetes

- Hypoglycaemia symptoms common in type 2 diabetes – 38% of patients report symptoms

- Associated with
  - Reduced Quality of Life
  - Reduced treatment satisfaction
  - Reduced therapy adherence
  - More common at Hba1c < 7%

Diabetes Obesity and metabolism 2008 Jun;10 Suppl 1:25-32

Diabetes UK Survey 2009

Hypoglycaemia

Hypoglycaemia may occur when people with diabetes are treated with certain medications such as sulphonylureas, prandial glucose regulators (Meglitinides) or insulin (Cryer and Arbeláez, 2017).

Hypoglycaemia is a lower than normal level of blood glucose. It can be defined as:

- Mild if the episode is self-treated
- Severe if assistance by a third party is required (DCCT,1993) cited in JBDS 2018.

Any blood glucose less than 4 mmol/L in an individual treated with insulin and/or a sulphonylurea should always be treated. Diabetes UK recommends that a blood glucose level of less than 4 mmol/l should always be treated, "4 is the floor"

Hypoglycaemia Risk factors

- Strict glycaemic control
- Previous history of severe hypoglycaemia
- Long duration of Type 1 diabetes
- Duration of insulin therapy in Type 2 diabetes
- Lipohypertrophy at injection sites
- Inappropriate insulin injection needle size
- Impaired awareness of hypoglycaemia
- Severe liver impairment
- Impaired renal function (including those patients requiring renal replacement therapy)
- Sepsis
- Inadequate treatment of previous hypoglycaemia
- Terminal illness
- Cognitive dysfunction/dementia
- Steroid reduction in people taking insulin or sulphonylureas

Causes of Hypoglycaemia

- Delayed or missed meals
- Too much medication
- Increased physical activity (unoplanned)
- Irregular lifestyle
- Poor injection sites
- Alcohol (excess or taken without food)
- Breastfeeding

Signs and Symptoms

Adrenergic

- Sweating
- Palpitations
- Shaking
- Hunger
- Anxiety
- Paraesthesia
- General malaise:

  headache and nausea.

Neuroglycopenic

- Confusion
- Drowsiness
- Unusual behaviour
- Speech difficulties
- Lack of co-ordination
- Coma

Treatment – if person conscious

15 – 20g quick acting CHO

- 60mls Gluco juice or,
- 200mls orange juice or,
- 5/6 dextrose tablets or,
- 5 large jelly babies or,
- 7 large jelly beans or,
- 2 tubes of 40% glucose gel (only if person able to swallow)

Check blood glucose level after 15 mins, repeat treatment if still below 4 mmols/L.

Treatment – if person unconscious

<u>In the situation where the person is unconscious or fitting:</u>

- Call 999 and seek urgent medical assistance
- If breathing, place the person in recovery position
- If person not breathing commence CPR
- Glucose should **<u>not</u>** be put in the mouth
- Glucagon can be given if available, and someone is trained to administer
- Once the person is conscious and able to eat then give 15-20g CHO

Impact of Hypoglycaemia

Hypoglycaemia impacts upon a number of areas of a person with diabetes' life including: driving, weight gain, medication adherence and psychological feeling of well being.

The fear of hypoglycaemia affects many people. Once experienced, the person may adapt their diabetes management to try to avoid a second event.

(Nash J 2015)

Fear of Hypoglycaemia – patient perspective

- Unpleasant symptoms/disruptive
- Loss of control, embarrasment
- Cause accident, ?harm others
- Impact on brain, ?death
- Effect on confidence
- Effect on relationships, burden to others
- Effect on work

Polonsky,1992; Richmond, 1996; Gonder-Frederick, 1997; Lundkvist, 2005; Patton, 2007

“Hypos” and the Person Perspective

- ‘Never been told about hypos’
- ‘Never had a hypo, what’s a hypo?’
- ‘I feel a bit hungry late mornings especially if I’ve been out shopping’
- ‘I have dizzy do’s’

- **Important to ask the right questions**
- **Regular reinforcement of information about hypoglycaemia and it’s avoidance is necessary**

Healthcare Professional Perspective

- GPs/PNs may not be aware of frequency of patient hypo's, why?

- Patients may not report it because:
  - they don't recognise it
  - they are worried it has lifestyle implications

Mortality risk with Hypoglycaemia

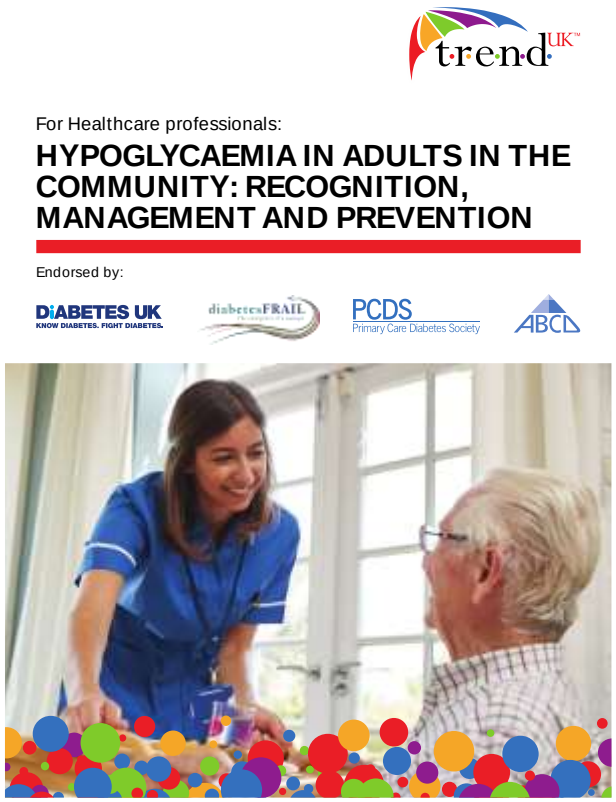
- Hypoglycaemia can cause coma, hemiparesis and seizures.
- If the hypoglycaemia is prolonged, the neurological deficits may become permanent.
- Severe hypoglycaemia is associated with increased mortality. McCoy et al (2012) auditing the impact of severe and mild hypoglycaemia five years after the event, found a 3-4 increase in mortality in people who experienced a severe hypoglycaemic episode compared to those who experienced a mild episode.
- A UK audit carried out in 2015 of 1182 paramedic call outs in people with hypoglycaemia revealed a 22% mortality in people with Type 2 diabetes within one year of the event (Elwen et al, 2015).

Strategies to avoid hypoglycaemia

- Education for all – person with diabetes, partner, family
- Consider treatment regimens with low risk of hypoglycaemia when managing vulnerable patients

  e. g. DPP-4 Inhibitors, SGLT2 inhibitors and GLP-1 RA
- Training in correct injection technique including detection of Lipohypertrophy
- Psychological support, if needed

Information leaflet



Available from

www.trend-uk.org

Information leaflet

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www.trend-uk.org

TREND-UK

- Website www.trend-uk.org
  - Patient leaflets
  - HCP documents and guidelines
  - Links to useful resources

Summary

Hypoglycaemia is:

- a side effect of some diabetes medication **not** of diabetes
- is more common then we think either because of poor recognition or by non-disclosure
- is avoidable with the correct information and treatment selection
- is costly to the person with diabetes and to the NHS

- HCPs need to be more vigilant at identifying hypoglycaemia

- HCPs need to be aware of ways of avoiding hypoglycaemia which may include using the newer therapies such as DDP-V inhibitors, SGLT2 inhibitors and GLP-1 RAs

Thank you for listening