Improving post-hypoglycaemic patient safety in the pre-hospital environment: a systematic review.

College of Emergency Medicine, London
September 2009

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Background

- 2.3 million people are currently diagnosed with diabetes in the UK. This is estimated to rise to 3 million by 2010.

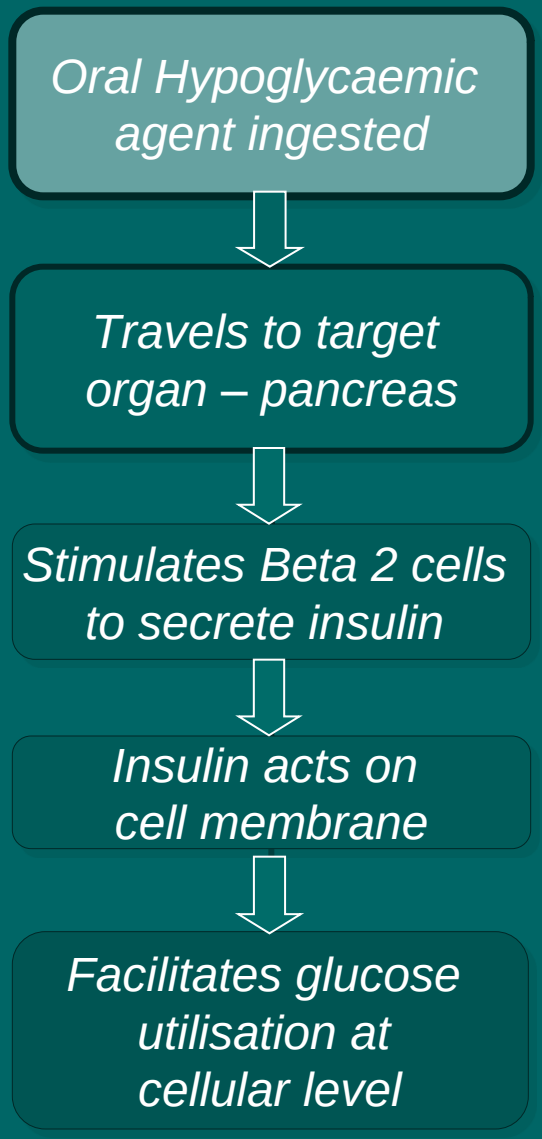
- Many UK Ambulance Services have introduced “Treat and Refer” or ”See and Treat” guidelines.

- Hypoglycaemia – International inconsistencies in guidelines for pre-hospital, post hypoglycaemic care, particularly in patients with type 2 diabetes.

- Scottish Ambulance Service audit data indicates approximately 50% of the 6500 diabetes related emergency calls per annum were for patients suffering from hypoglycaemia.

Oral Hypoglycaemic Agents

OHA's
Type 2 diabetes.
Aid regulation of patients blood glucose.
Used where there is residual pancreatic function.



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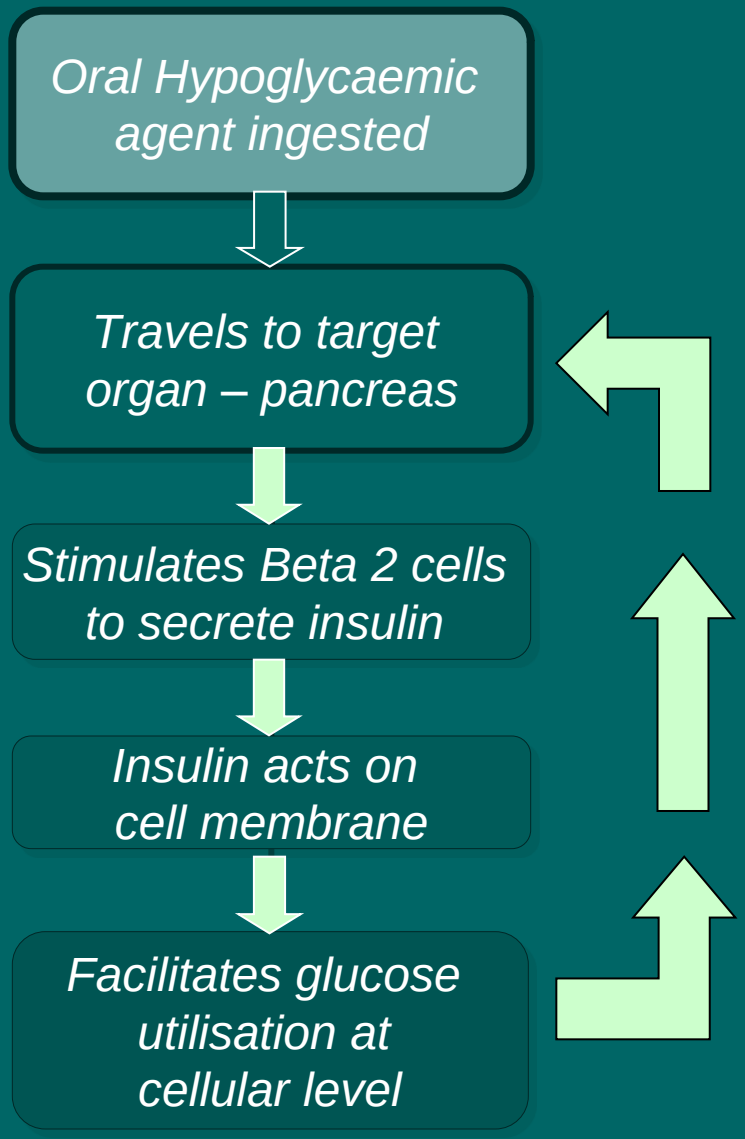


Duration of action of OHA's range between 6 and 48 hours.

Ambulance clinicians may treat and discharge post-hypoglycaemic patients, treated with OHA's, only for them to suffer a repeat hypoglycaemic event (RHE) hours or even days later.

Hypoglycaemia may be recurrent or prolonged.

Aims

To determine:

• The extent to which post-hypoglycaemic diabetic patients who are prescribed OHA's are at risk of repeat hypoglycaemic events after being treated in the pre-hospital environment,

And;

• Whether they should be transported to hospital regardless of post treatment response.

Methods

Search Strategy:

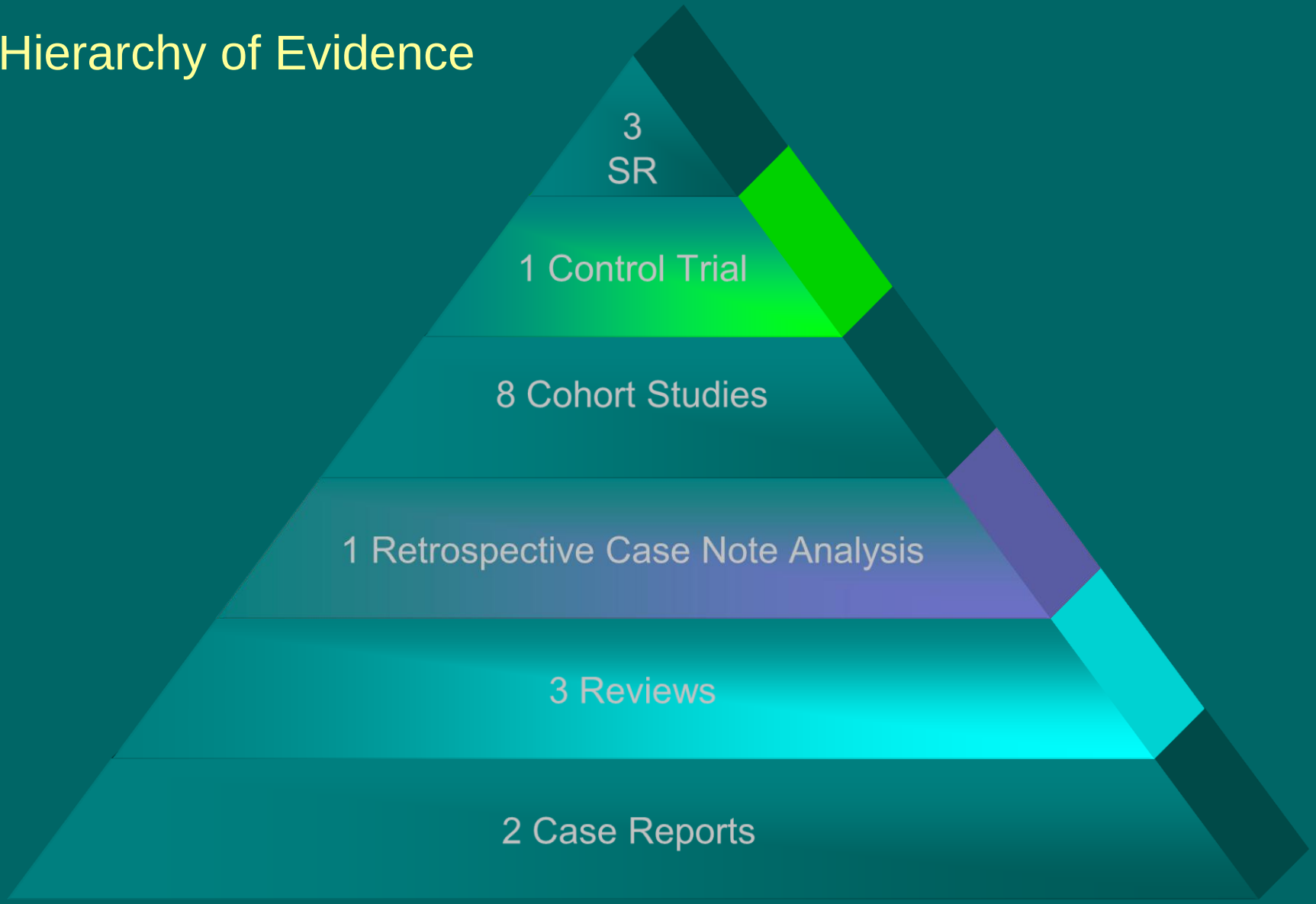
- Medline (using Pubmed) was searched.
- Electronic searching of The Cochrane Library and clinicaltrials.gov.
- Hand Searching of clinical text books and key journals.
- Gray literature (unpublished literature).
- Personal communication with other ambulance services and diabetologists.

Inclusion criteria: peer reviewed papers, textbooks, letters and unpublished documents.

Exclusion criteria: papers not including type II diabetics treated with OHA's, not of direct relevance, or not published in English.

Analysis: A narrative synthesis was used to describe findings.

Hierarchy of Evidence



Findings

12 papers emphasised the inherent dangers associated with OHA's and provided examples of associated risks and their causes.

Primary risks

- Hypoglycaemia.
- Repeat/prolonged hypoglycaemia.
- ⇩ LOC, hypoxia, seizure, cerebral oedema and rarely, death.
- Elderly.
- History of vascular disease.

Contributory factors

- Renal failure.
- Hepatic failure.
- Medication interaction.
- Reduced food intake.
- Alcohol.
- Accidental or deliberate overdose.

Failure of the ambulance clinician to recognise the significance of any of these risks/causes may lead to a patient experiencing a RHE

Findings cont.

To determine the extent to which post-hypoglycaemic diabetic patients who are prescribed OHA's are at risk of repeat hypoglycaemic events after being treated in the pre-hospital environment?

- Overall incidence of OHA induced hypoglycaemia was reported as being between 0.8 and 12%.
- Five studies followed up patients left at home to identify repeat callers.
- There was no standard definition of recurrence time which ranged between 24 and 120 hours.
- The incidence of pre-hospital repeat hypoglycaemic event within 48 hours varied between 2 and 7%. There was insufficient detail to determine involvement of OHA's.

Findings cont.

Should these patients be transported to hospital regardless of post treatment response?

- Ten papers highlighted treatment in, or suggested treatment only available within the hospital environment.

- Two papers advised observation periods for OHA induced hypoglycaemia; one 24 hours and the other a minimum of 8 hours.

- Several authors concluded that patients treated with OHA's were "high risk patients", "thresholds for admission should be low" and that they should be "convinced to travel to hospital".

Conclusions

- Although incidence is low, OHA's can and do cause repeat hypoglycaemic events.
- Post-hypoglycaemic patients treated in the pre-hospital environment are at a 2-7% risk of experiencing a RHE within 48 hours. OHA involvement could not be determined.
- Ambulance clinicians failure to recognised risks/causes of OHA induced hypoglycaemia, with failure to treat accordingly, may lead to a patient being inappropriately left at home and exposed to the possibility of a RHE.
- The lack of high quality evidence in this area has led to the recommendation that conservative management through admission to hospital is appropriate.

Recommendations

Practice recommendations:

- Hypoglycaemia S&T guidelines should recommend that patients treated with OHA's are transported to hospital for observation and treatment. Ambulance clinicians should receive education on the appropriate management of hypoglycaemic patients treated with OHA's.
- Referral Pathways should be developed to ensure appropriate follow-up care for all diabetic patients. (Walker et al 2006, EMJ)

Ongoing research:

- Diabetes UK is funding a study to develop and evaluate an evidence-based intervention to increase post-hypoglycaemic patients attendance at primary care.
- Joint funding (The University of Sitrling and SAS) of a PhD studentship. This work will investigate the causes of the repeat calls RHE, the time frames in which these occur and the length of observation time required to ensure patient safety.

Acknowledgements

The authors would like to thank Professor Bruce Guthrie, Mr William Mason, Mr Keith Colver, Mr Robin Lawrenson and Mr Richard Whitfield for their assistance and advice in the development of this paper.

We would like to express our gratitude to Dr RG Pirallo and Dr J Steinmetz who provided additional information on their research.

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Fitzpatrick D, Duncan EAS. Improving post-hypoglycaemic patient safety in the pre-hospital environment: a systematic review. *Emergency Medicine Journal* 2009; 26: 472-478

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