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Review article

Deintensification of hypoglycaemic medications-use of a systematic review approach to highlight safety concerns in older people with type 2 diabetes

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ABSTRACT

Importance: Intensive treatment of older people with diabetes is common placing them at increased risk of adverse events such as hypoglycaemia and hospitalisation for drug errors. Little is known about when, how or for whom to deintensify hypoglycaemic medications.
Objective: To explore the characteristics of patients for whom deintensification is appropriate and to determine the outcome of deintensification.
Evidence review: Medline, Google scholar and EmBase search from 1997 to present was performed using keywords relating to diabetes mellitus, polypharmacy, hypoglycaemia, hospitalisation, deintensification, deprescribing and reduction, simplification or withdrawal of hypoglycaemic medications. Only English language articles were selected. Articles were reviewed for relevance by abstract. A manual review of citations in retrieved articles was performed in addition to the electronic literature search.
Findings: Those who are over treated appear to be of older age group, frail with weight loss and have multiple medical morbidities especially renal impairment and dementia. Simplification, reduction or even complete withdrawal of hypoglycaemic medications in these patients appears to be feasible without deterioration of glycaemic control.
Conclusions: Over treatment is common in frail older people with multiple comorbidities and deintensification appears safe in this group of patients. Current recommendations emphasise preventing underuse rather than overuse of medications, and therefore, a change in guidelines advice may be warranted.

1. Introduction

In old age, diabetes is associated with a high comorbidity burden that leads to polypharmacy and sometimes overtreatment. Overtreatment is the use of a treatment even when the potential harms exceed the possible benefits.[1] Overtreatment with hypoglycaemic medications appears to be common in older and frail people with diabetes increasing their risk of adverse events especially hypoglycaemia.[2,3] Hospitalisation for hypoglycaemia in older people with diabetes now exceeds that for hyperglycaemia (105.0 vs 70.0 admissions per 100,000 person-years) and those with tight glycaemic control have the greatest risk.[4,5] Therefore, many of these patients will qualify for medication deintensification or deprescribing. Deintensification or deprescribing is a review process to simplify, reduce or completely withdraw medications to eliminate the risk of polypharmacy and its associated adverse outcomes. However, many barriers to deintensification exist at the health care professional, the general public and the health care system levels (Box 1). We still know very little about the process of medication deintensification especially the outcome of this process. There are no clinical guidelines that clearly advise when to deintensify hypoglycaemic medications or describe patients' characteristics for whom deintensification is appropriate. This article reviews the prevalence of overtreatment in older people with diabetes, the characteristics of patients who may benefit from deintensification and the associated outcomes.

2. Methods (Fig. 1)

2.1. Data sources

We have searched Medline, Google scholar and EmBase using keywords relating to diabetes mellitus, polypharmacy, hypoglycaemia,

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Box 1
Barriers to deintensification of hypoglycaemic medications in older people with diabetes.

Health care system related barriers

- No randomised controlled clinical trials on deintensification.
- Lack of explicit guidelines on deintensification.
- Pharmacological companies pressure to prescribe.
- Biased publications for positive studies.
- Lack of dynamic targets.

Health care professionals related barriers

- Less appreciation for the need of deintensification.
- No incentives for deintensification.
- Fear of litigation.
- Performance-linked pay.
- Over testing of HbA1c.

General public related barriers

- Beliefs that doctors must prescribe.
- Beliefs that medicines cure disease.
- Reduced awareness of the adverse effects of overtreatment.
- Deintensification may be perceived as only for cost saving.
- Reduced awareness of the dynamic nature of their multimorbid condition.

hospitalisation, deintensification, deprescribing and reduction, simplification or withdrawal of hypoglycaemic medications. Only English language articles were selected. Articles were reviewed for relevance by title. Articles were then screened for inclusion criteria from abstracts, full texts, or a combination of these. We also manually reviewed citations in the retrieved articles to identify studies that may have been overlooked in the database search.

2.2. Study selection

Studies were included if they satisfied one of the following inclusion criteria: 1. Studies which described characteristics of patients who were inappropriately intensively treated with hypoglycaemic medications (defined by the authors as those with dangerously low blood glucose levels putting them at high risk of hypoglycaemia). 2. Studies which described deintensification (reduction, simplification or complete withdrawal) of hypoglycaemic medications in older people with diabetes and reported any outcomes after a period of follow up.

2.3. Data extraction

We independently reviewed the studies, assessed relevance to the review topic and performed data extraction in a standardised format. Disagreements were resolved by consensus between us. The following data were extracted from the relevant studies: 1. type, setting and aim of the study and baseline characteristics such as number of patients, mean age and gender. 2. Characteristic of patients who were eligible for deintensification. 3. Methods of hypoglycaemic medication deintensification e g reduction, simplification or complete withdrawal. 4. Outcomes of deintensification e g glycaemic control, rate of hypoglycaemia and general wellbeing.

3. Results

The title search provided 3728 articles which were then screened for inclusion criteria from abstracts and full texts. Out of the 3728 studies identified, 24 studies were initially included by abstract screening. Full text of the manuscripts were then reviewed for these 24 articles from which 14 were further excluded (10 studies were not deintensification, 2 studies had no data on patients' characteristics and another 2 studies did not report deintensification outcomes). The remaining 10 studies met the inclusion criteria and were included in this review. Five articles described patients' characteristics who were suitable for deintensification and another 5 articles reported the outcome of deintensification after a period of follow up.

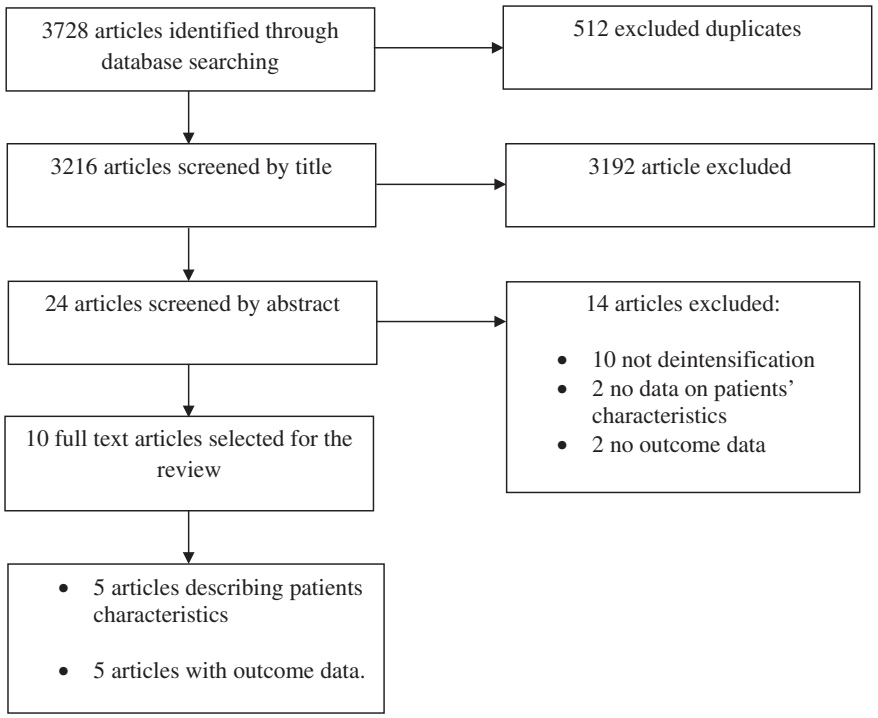

Fig. 1. Articles identification and inclusion in the review.

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