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## Objectives

A growing number of reports have been published associating hypoglycemia with non-antidiabetic drugs. Clinical pharmacists are often faced to hypoglycemia in patients with multiple medications.

**Aim of the project:** To investigate the potential relationship between prescribed drugs and hypoglycemia episodes during hospitalization.

## Methods

Point-of-care blood glucose values and prescribed drugs were analyzed in patients admitted to a regional Swiss hospital from January 2013 to December 2015.

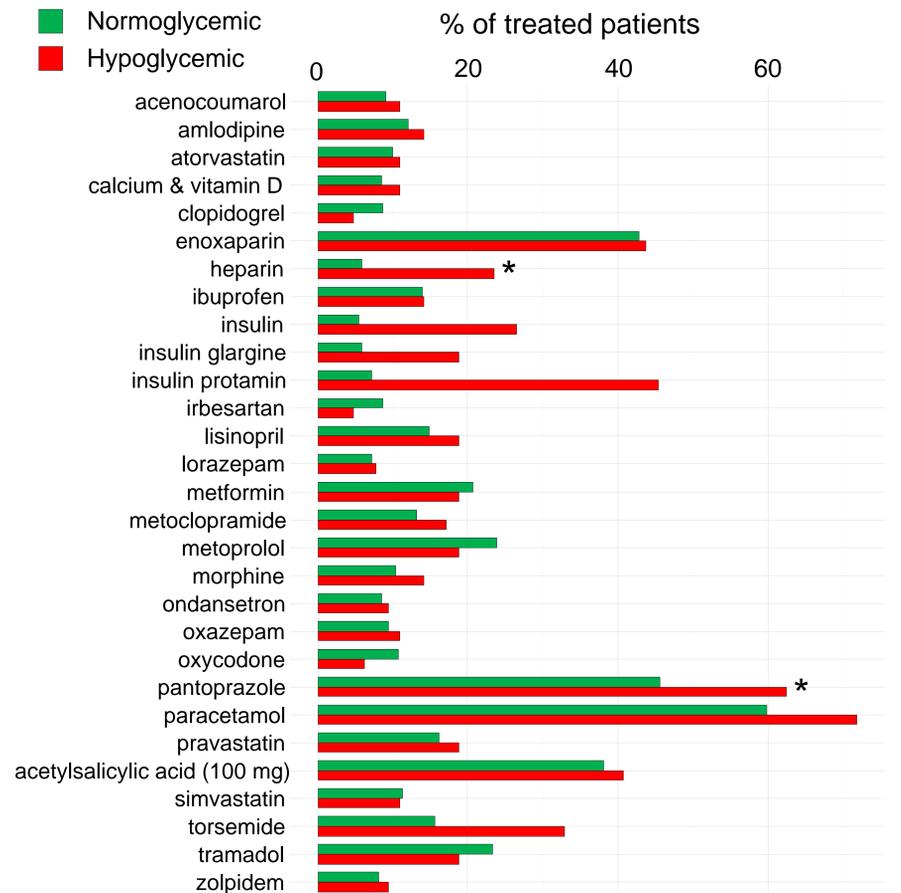
Hypoglycemia cases were defined as patients with at least one hypoglycemic event (random glucose value  $\leq 3.9$  mmol/L), and normoglycemic cases as those with random glucose concentrations within the range of 4.5 to 5.8 mmol/L during hospitalization.

## Results

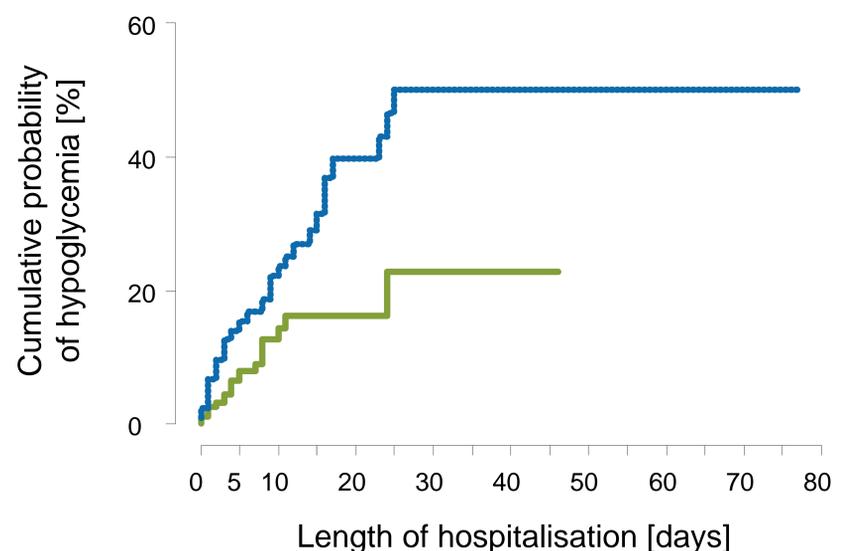
A total of 373 patients were included (median age: 74 years). Distribution of hypoglycemia cases, gender and antidiabetic drug use is presented in **figure 1**. Gender and age were found to be similar among normoglycemic and hypoglycemic patients.

Association between the most frequently prescribed drugs and hypoglycemia is presented in **figure 2**. After adjusting for available confounders (age, gender, insulin and/or insulin secretagogues use), prescription heparin (odds ratio=2.8,  $IC_{95}=1.7-7$ ,  $p=0.02$ ) and pantoprazole (odds ratio=1.9,  $IC_{95}=1-3.7$ ,  $p=0.04$ ) was associated with hypoglycemia.

As shown in **figure 3**, a higher rate of hypoglycemia was observed among patients with more than eight administered non diabetic drugs per day. This finding was confirmed after adjusting by available confounders (hazard ratio=2.3,  $IC_{95}=1.4-4$ ,  $p=0.002$ ).



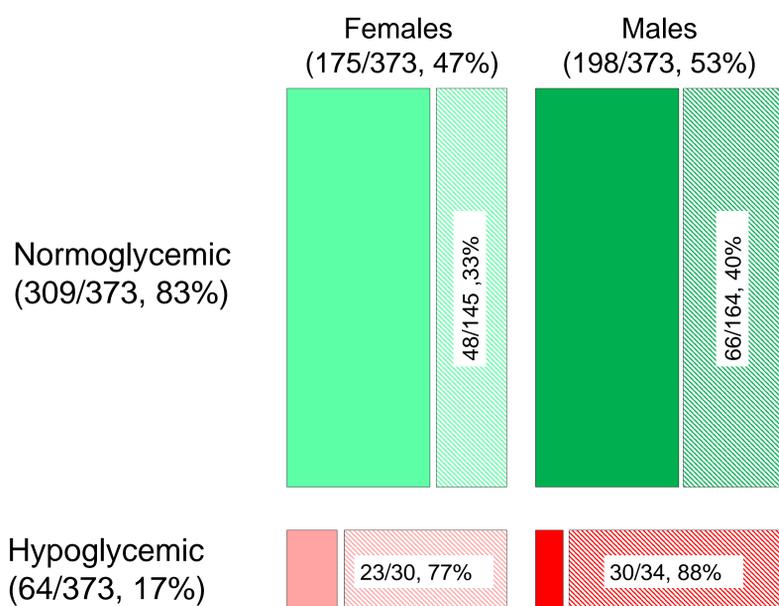
**Figure 2: Prescribed drugs and hypoglycemia.** Percentage of patients treated with certain drugs in normoglycaemic and hypoglycemic groups. \*: significant in multivariate analysis



No. at risk:

$\leq 8$ drugs	195	120	50	27	18	12	6	2	2	1
$> 8$ drugs	178	127	57	29	18	15	6	4	3	3

**Figure 3: Polymedication and hypoglycemia.** Kaplan-Meier curves for patients with more than eight prescribed non diabetic drugs (blue dotted line) and equal or less than eight drugs (green line).



**Figure 1: Cohort description.** Mosaic plot representing the distribution of normoglycemic (green), hypoglycemic (red), females (left) and males (right). The hatched area represent the cases with at least one antidiabetic drug.

## Discussion

Heparin and pantoprazole were found to be associated with hypoglycemia events. These results require confirmation in further studies.

In line with previous published reports, a combination of more than 8 non-diabetic drugs exposes the patient to a greater risk of hypoglycemia.

The relationship between hypoglycemia and polypharmacy supports the demand to limit polypharmacy as much as possible, especially in elderly patients. This result underlines the potential involvement of clinical pharmacists with the aim to reduce the risk of hypoglycemia during hospitalization.