

# Patients with severe diabetic hypoglycaemia in Swiss emergency care services

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## Background

Hypoglycaemia is the most common complication associated with diabetic medication and represents the greatest barrier in achieving and maintaining good glycaemic control<sup>(1)</sup>. Severe hypoglycaemic events (SHE) are the most frequent reason for people with diabetes to require emergency service treatment<sup>(2)</sup>.

## Aim

The aim of this study was to explore SHE of patients presenting to a Swiss emergency service, including pre-hospital care with emergency medical service (EMS) and emergency department (ED) presentations to ascertain:

- number of patients requiring EMS & ED treatment,
- characteristics of presenting patients.

## Results

### Number of patients requiring EMS & ED treatment

In 36 patients with diabetes a total of 43 SHE was identified. Of the 43 events, 28% ( $n=12$ ) involved contact with the EMS only, 7% ( $n=3$ ) were seen by the ED but did not use EMS, and 65% ( $n=28$ ) of presentations used EMS and were then taken to the ED.

### Patient characteristics

54% ( $n=23$ ) events occurred in males with a median age of 65.1 years ( $SD\pm 17.5$ ). More than half of the patients were retired ( $n=24$ ; 56%), and 56% ( $n=24$ ) were married or living with a partner. The initial mean blood glucose in all presenting patients was 2.1mmol/L ( $SD\pm 0.8$ ) regardless at their place of care. Further medical characteristics are shown in table 1.

The 12 patients who were treated by EMS only and discharged to everyday life environment were significantly younger compared to those admitted to ED (EMS patients discharged to everyday life:  $Md=54$  years vs. EMS patients discharged to ED:  $Md=72$  years;  $U=98.000$ ;  $p=.039$ ). Those patients did not differ in the initial glucose meter reading, gender, type of diabetes, or diabetic medication.

In 20 cases, the ED presentation led to an in-hospital admission. A comparison between patients discharged and in-patients showed a significant difference in their age (ED patients discharged home:  $M=61$  years vs. ED patients with in-hospital follow-up:  $M=73$  years;  $T=-2.265$ ;  $p=.031$ ). Also in this group, no differences were found in the initial glucose meter reading, gender, type of diabetes, or diabetic medication.

## References

- (1) Brod, M., Christensen, T., Thomsen, T. L., & Bushnell, D. M. (2011). The impact of non-severe hypoglycemic events on work productivity and diabetes management. *Value Health*, 14(5), 665-671.  
 (2) Brackenridge, A., Wallbank, H., Lawrenson, R. A., & Russell-Jones, D. (2006). Emergency management of diabetes and hypoglycaemia. *Emergency Medicine Journal*, 23(3), 183-185.

## Method

Retrospective data collection in a single Swiss ED and its EMS was undertaken of all adult patients with type 1 and 2 diabetes. All participants were treated in the ED and/or EMS due to SHE between 01/01/2014 and 31/12/2014.

Data were retrieved from the electronic sources onto study specific case report forms. Descriptive analysis was conducted, including frequency and distribution of single variables, such as central tendency (mean) and dispersion (range or standard deviation). Ethical approval from the Swiss cantonal ethics committee was obtained before study start (KEK-ZH-Nr. 2015-0276).

Table 1: Medical characteristics

	Sample N=43	EMS n=12	ED n=3	EMS and ED n=28
Diabetes type, n(%)				
Type 1	19 (45.2%)	8 (72.7%)	-	11 (39.3%)
Type 2	23 (54.8%)	3 (27.3%)	3 (100%)	17 (60.7%)
Diabetes since (years), M(±SD)				
Type 1	20.54 (±10.2)	23.42 (±4.1)	-	17.17 (±14.3)
Type 2	16.00 (±10.4)	12.00 (±0.0)	17.00 (±0.0)	16.31 (±10.7)
Diabetic medication, n(%)				
Antihyperglycaemic agents	3 (7.3%)	-	2 (66.7%)	1 (3.6%)
Insulin	29 (70.7%)	10 (100%)	1 (33.3%)	18 (64.3%)
Combination	9 (22.0%)	-	-	9 (32.1%)
HbA1 <sub>c</sub> (mmol/L), M(±SD)	7.70 (±1.2)	7.54 (±1.1)	7.45 (±2.0)	7.84 (±1.2)

## Discussion

Most patients affected by SHE were male, over 65 years of age, living with a partner, and suffering type 2 diabetes over a decade. Interestingly, younger patients treated by EMS at home tend to remain at home in contrast to the older patients who were admitted to hospital. This was also true for the emergency department where older people in particular (>72 years) became in-patients after such an event. As the older population grows rapidly, this is an important finding for future interventions to be developed in order to minimize hospital admissions.

## Implications for practice

The patients most likely to suffer a SHE are men, living with a partner, and are over 65 years old. Furthermore, they are living with a diabetes type 2 since more than 10 years. These findings help to identify patients most at risk and those who would benefit from preventive interventions.

## Implications for research

These results will inform an ongoing grounded theory study looking at patients needs after experiencing a SHE. Based on the results of both studies, brief interventions for the affected patients will be developed.

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