

## Population-Based Study of Severe Hypoglycemia Requiring Emergency Medical Service Assistance Reveals Unique Findings

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### Abstract

#### Objective:

The objective is to report a contemporary population-based estimate of hypoglycemia requiring emergency medical services (EMS), its burden on medical resources, and its associated mortality in patients with or without diabetes mellitus (DM, non-DM), which will enable development of prospective strategies that will capture hypoglycemia promptly and provide an integrated approach for prevention of such episodes.

#### Methods:

We retrieved all ambulance calls activated for hypoglycemia in Olmsted County, Minnesota, between January 1, 2003 and December 31, 2009.

#### Results:

A total of 1473 calls were made by 914 people (DM 8%, non-DM 16%, unknown DM status 3%). Mean age was  $60 \pm 16$  years with 49% being female. A higher percentage of calls were made by DM patients (87%) with proportionally fewer calls coming from non-DM patients (11%) (chi-square test,  $p < .001$ ), and the remaining 2% calls by people with unknown DM status. Emergency room transportation and hospitalization were significantly higher in non-DM patients compared to DM patients ( $p < .001$ ) and type 2 diabetes mellitus compared to type 1 diabetes mellitus ( $p < .001$ ). Sulphonylureas alone or in combination with insulin varied during the study period ( $p = .01$ ). The change in incidence of EMS for hypoglycemia was tracked during this period. However, causality has not been established.

Death occurred in 240 people, 1.2 (interquartile range 0.2–2.7) years after their first event. After adjusting for age, mortality was higher in non-DM patients compared with DM patients ( $p < .001$ ) but was not different between the two types of DM.

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**Abbreviations:** (AI) adrenal insufficiency, (CGM) continuous glucose monitoring, (CI) confidence interval, (CLD) chronic liver disease, (CSII) continuous subcutaneous insulin delivery, (DM) diabetes mellitus, (EMS) emergency medical services, (ER) emergency room, (ERT) emergency room transportation, (ESRD) end-stage renal disease, (HR) hazard ratio, (IQR) interquartile range, (MDI) multiple daily insulin injection, (non-DM) with no diabetes mellitus, (OAA) oral antihyperglycemic agents, (SD) standard deviation, (SFUI) sulphonylureas alone or in combination with insulin, (T1DM) type 1 diabetes mellitus, (T2DM) type 2 diabetes mellitus

**Keywords:** ambulance, diabetes, emergency room transportation, hypoglycemia

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**Abstract cont.**

**Conclusions:**

The population burden of EMS requiring hypoglycemia is high in both DM and non-DM patients, and imposes significant burden on medical resources. It is associated with long-term mortality.

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