Il progetto HYPOTHESIS

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Risultati

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società italiana medicina
d'emergenza-urgenza

CONVEGNO
HYPOTHESIS
HYPOglycemia Treatment
in the Hospital Emergency System

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Aula Stabat Mater - Palazzo dell'Archiginnasio

HYPOthesis - Background/Aims

- The direct burden of hypoglycemia for people with diabetes and for the National Health system is difficult to determine
- Very few data exist on the extent of service use after an episode of hypoglycemia by subjects with diabetes, including frail people with Type 2 diabetes
- We describe the demographic and clinical characteristics of subjects attending the Emergency Departments (EDs) of general hospitals of the Italian Health Service because of a hypoglycemic event, the management of the event and the final outcome.

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46. Vibo Valentia - Presidio Ospedaliero Jazzolino , Medicina e Chirurgia d'Accettazione e d'Urgenza ,

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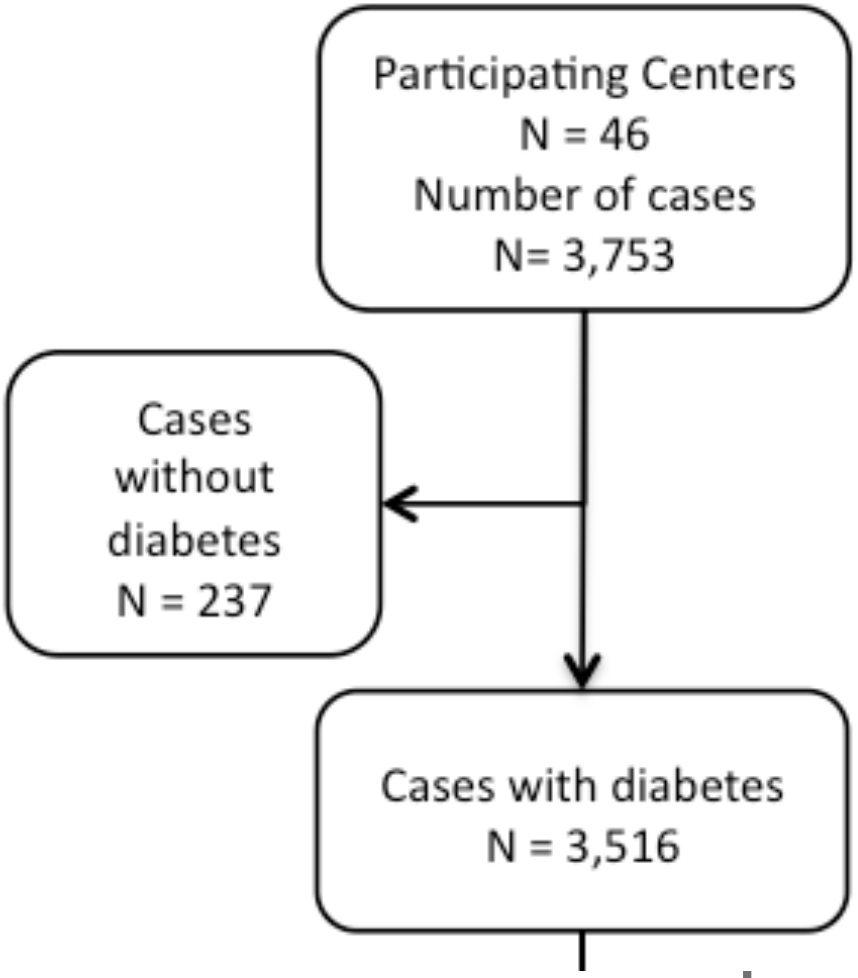
Flow chart of the study

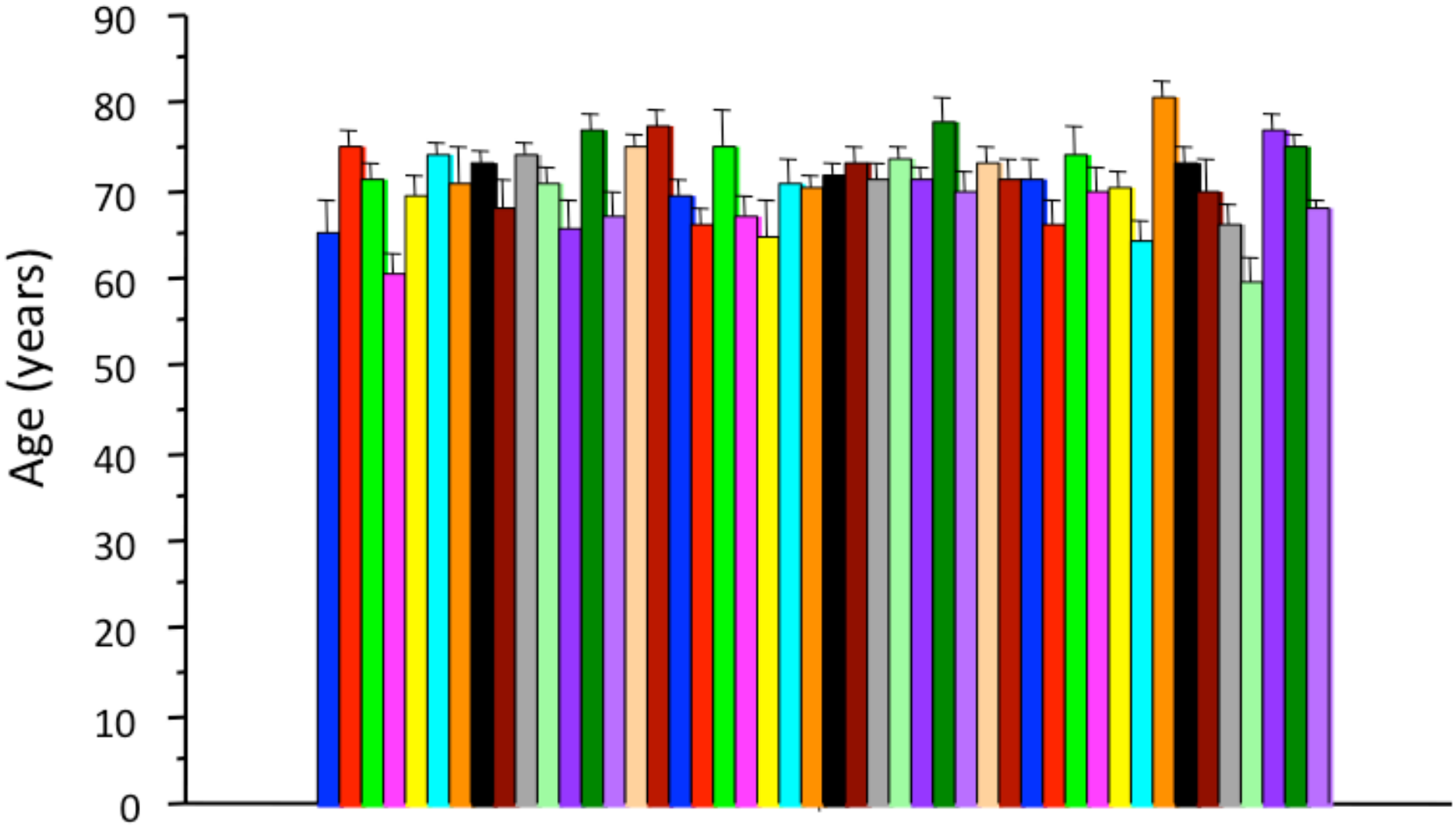
- 46 EDs of general hospitals, an area of ≈ 12 million inhabitants
- Study coordinated by the Italian Society of Emergency Medicine (SIMEU)
- All cases attending the EDs for a hypoglycemic event from Jan 2011 to Jun 2012.
- ED databases were searched according to a pre-defined case report form (CRF), including age, gender, diagnosis of DM and comorbidities



Clinical data

- Gender, Males (50.5%);
- Mean age, 70; (median, 76; range, < 1 year to 102 years);
  - Insulin, 65 ± 20; OHA, 79 ± 11; Ins + OHA, 75 ± 12
- Mean duration of disease, < 1 mo to 60 yrs (median, 40 mo).
- Blood glucose at time of event (n = 2314), 45 ± SD 27 mg/dL
  - Below 2 mmol/L, 960 (42%), 2-3 mmol/L, 863 (37%).
- The event required automedication; in addition, the subjects received assistance at home by the personnel of the out-of-hospital ED service (*118*) in 1,821 cases (51.8%).
- Treatment: glucose or glucose drinks + i.v. glucose (1,430 cases), i.m. glucagon (22 cases) at home or on ambulance, before arrival to hospital.
- In hospital, oral glucose (564 cases), i.m. glucagon (63 cases) or i.v. glucose (2,483 cases).

Age by Centers



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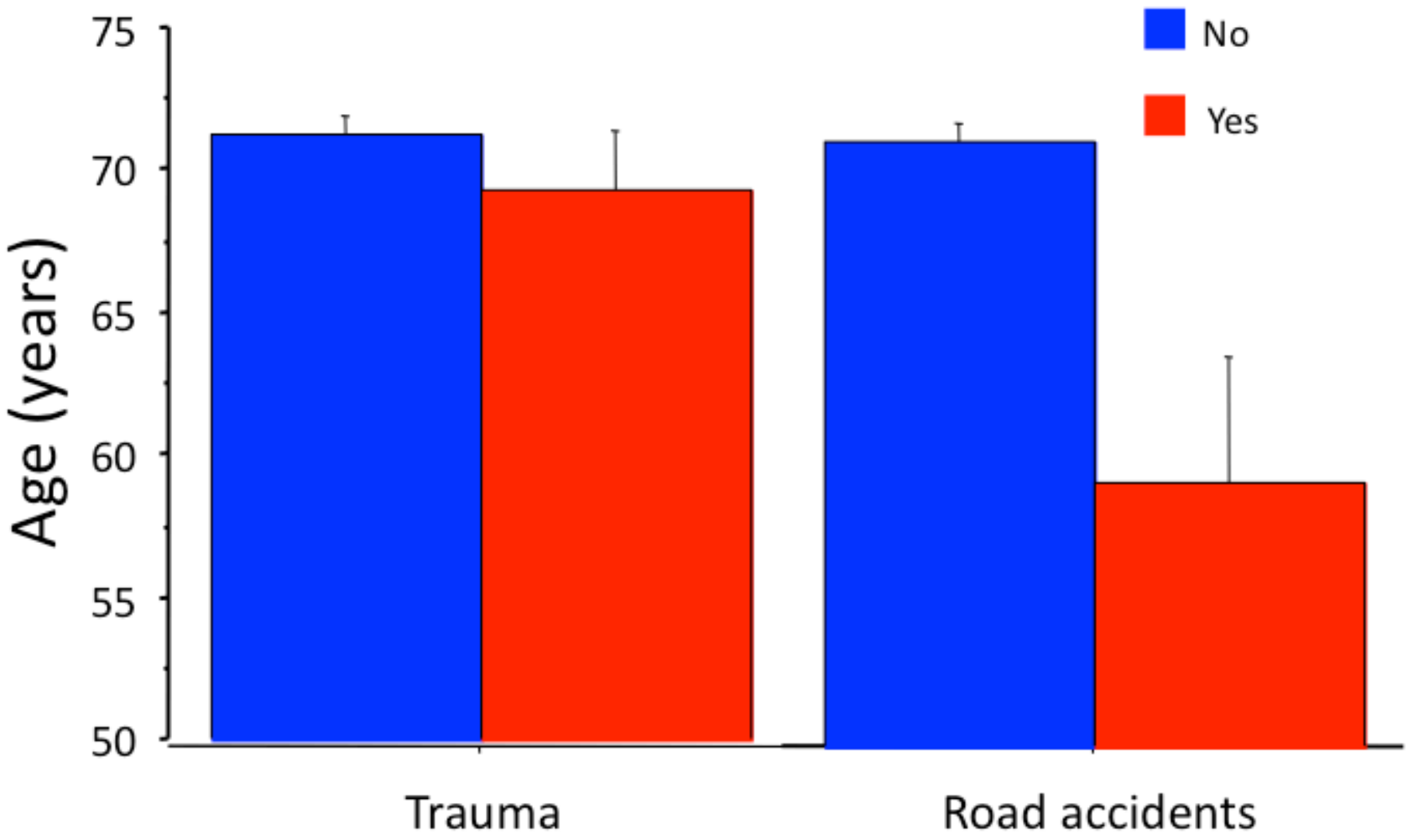
Comorbidities

Data	No. of cases (%)	Data	No. of cases (%)
Cardiovascular disease	1,884 (53.6)	Chronic hepatic failure	138 (3.9)
Chronic kidney disease	411 (11.7)	- Hepatocellular carcinoma	9 (0.3)
- On dialysis	34 (1.0)	Alcohol abuse	119 (3.4)
Chronic respiratory disease	313 (8.9)	Pancreatic disease	65 (1.8)
Cancer*	312 (8.9)	- Pancreatic carcinoma	40 (1.1)
Cognitive decline	272 (7.7)	Solid organ transplantation	30 (0.9)
Malnutrition	165 (4.7)	One or more comorbidities	2,320 (76.0)
Psychiatric disease	148 (4.2)		
Hypothyroidism	148 (4.2)		

Traumatic injury was recorded in 287 cases; involvement in a traffic accident in 47

*Including cases with hepatocellular and pancreatic carcinoma

Age by Events



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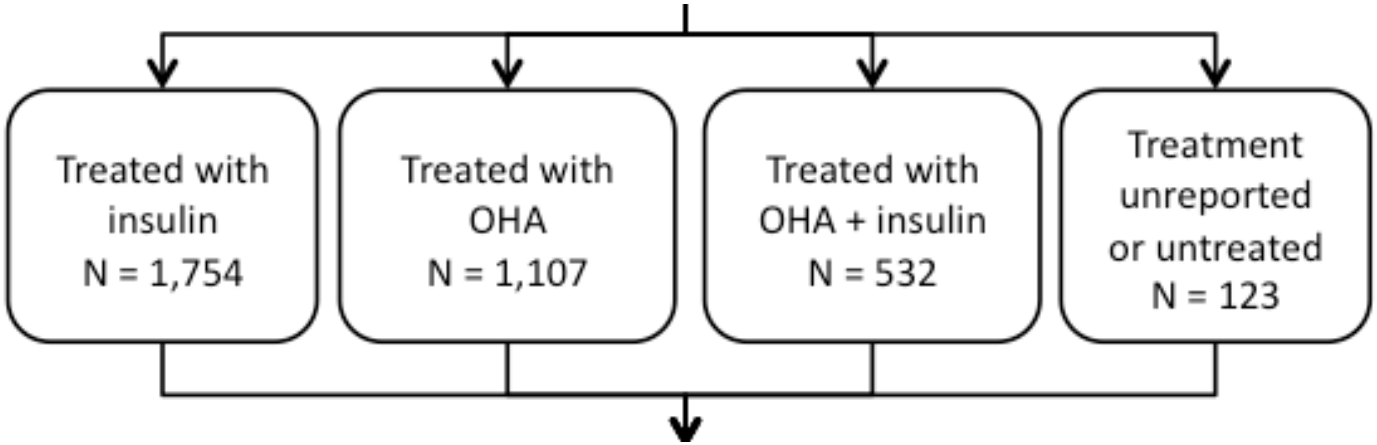
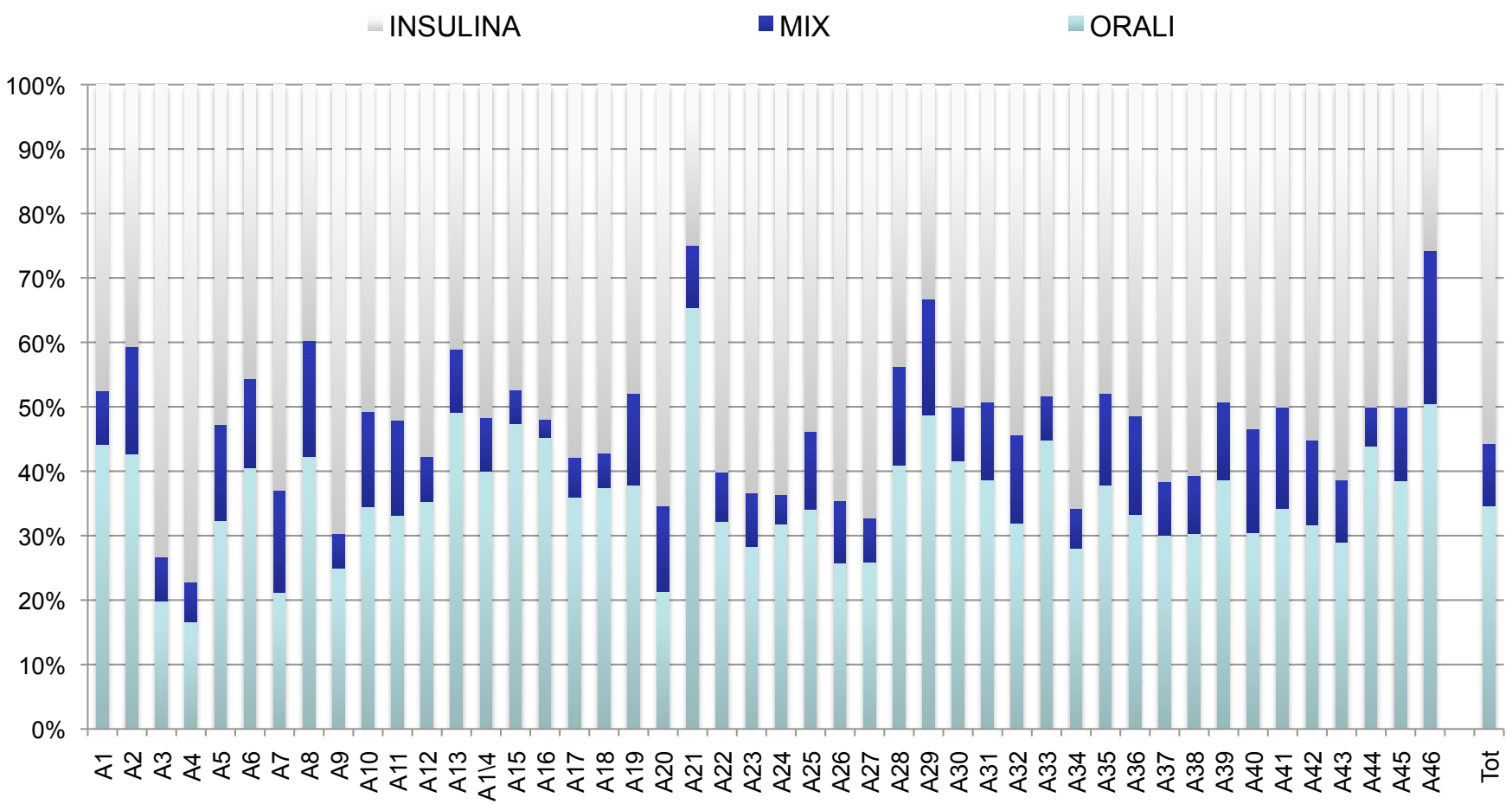
Drug treatment



- Insulin was the sole treatment in 50% of cases,
- 31% were treated by oral agents,
- 15% were on combination treatment (insulin + oral agents).
- In 3.5% of cases treatment was not registered (n = 60, 1.7%) or subjects were reported as untreated (n = 63, 1.8%).
- No hypoglycemic events were reported in association with GLP-1 receptor agonists.

Tipo di farmaci



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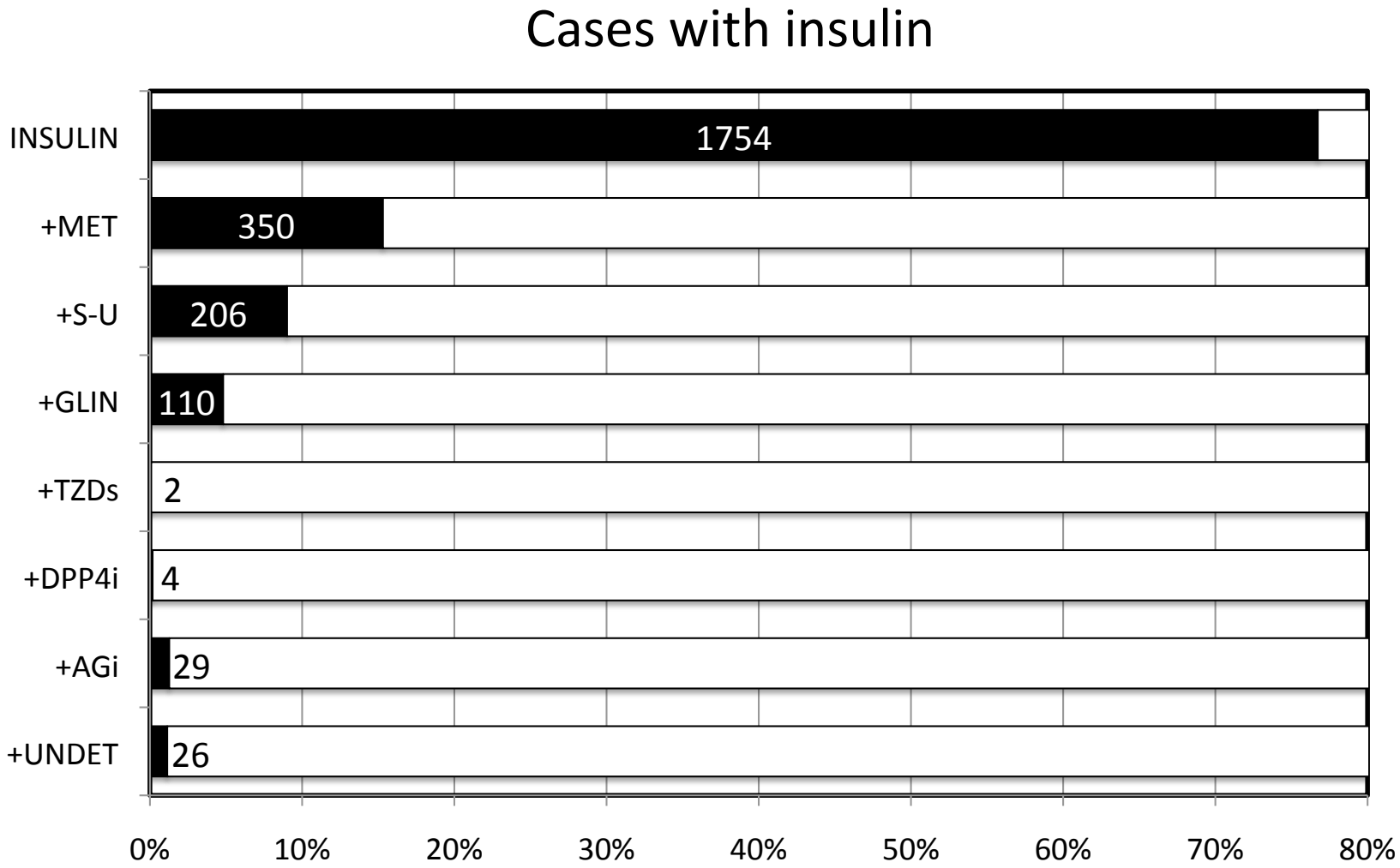
Drug treatment



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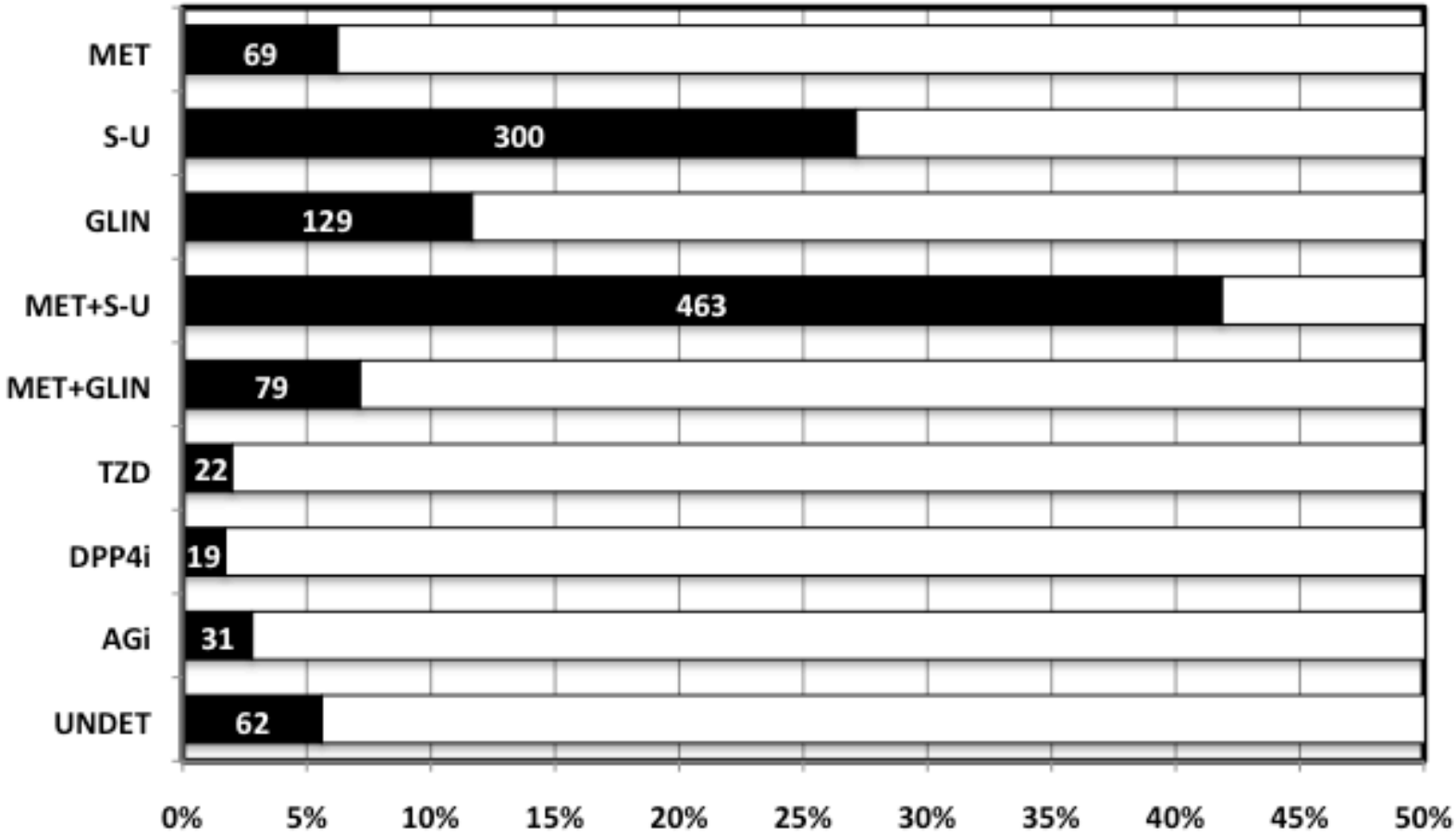
Drug treatment

Oral Agents



Of note, among the 23 cases where DPP4i were recorded, insulin was present in 4, MET in 18, S-U in 11, repaglinide in 4, TZDs in 2, variably combined

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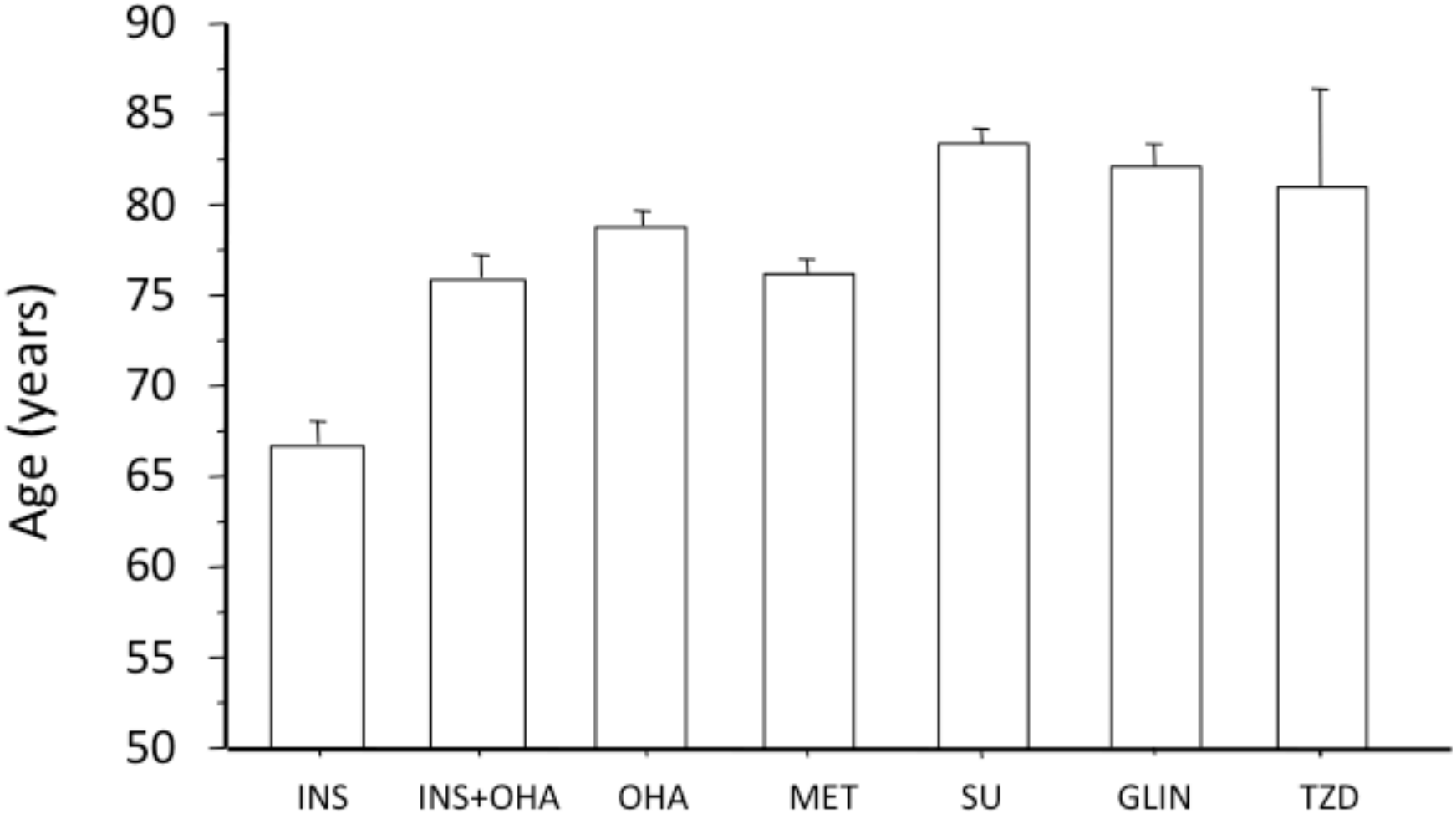
HYPOTHESIS study



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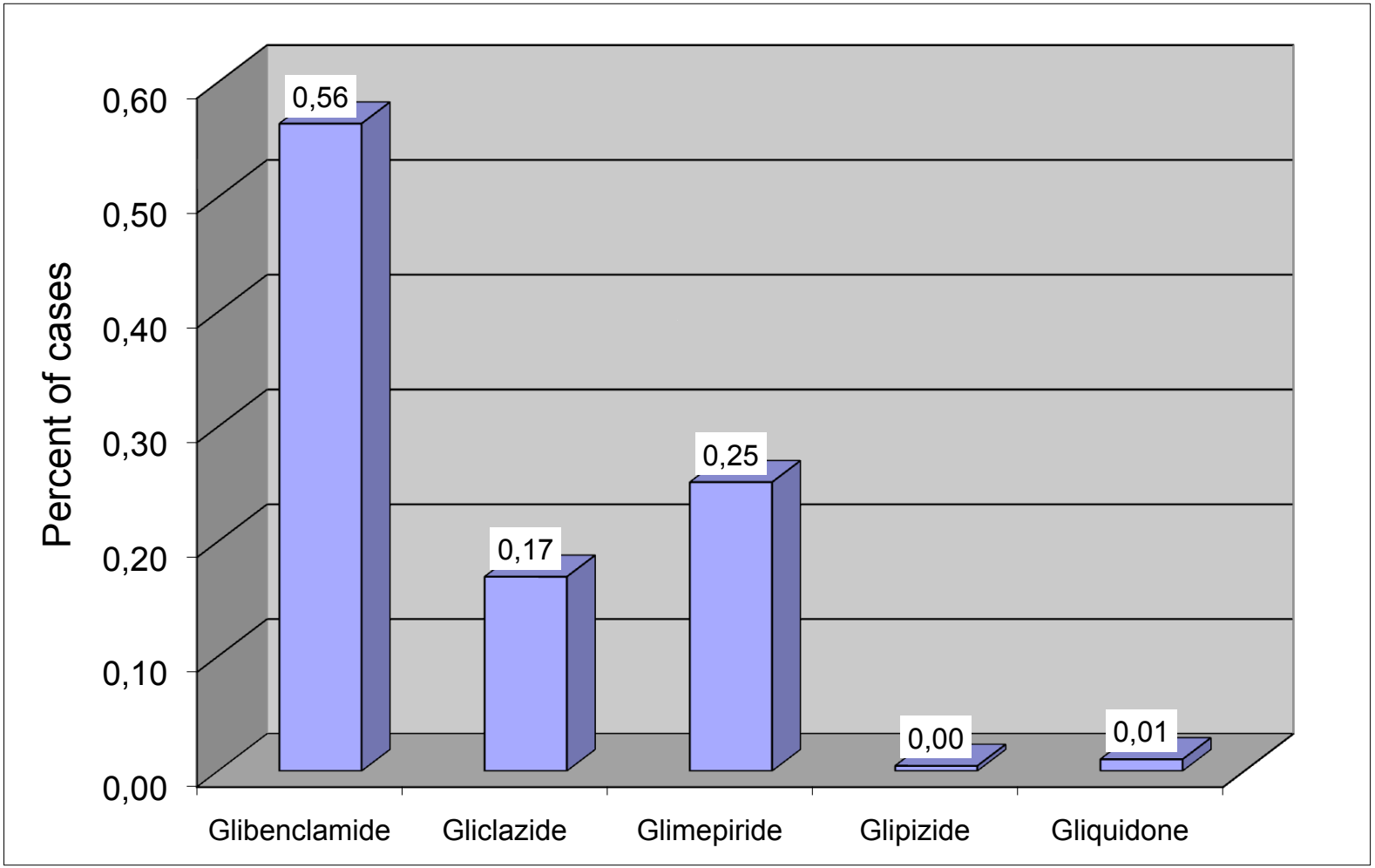
HYPOTHESIS study



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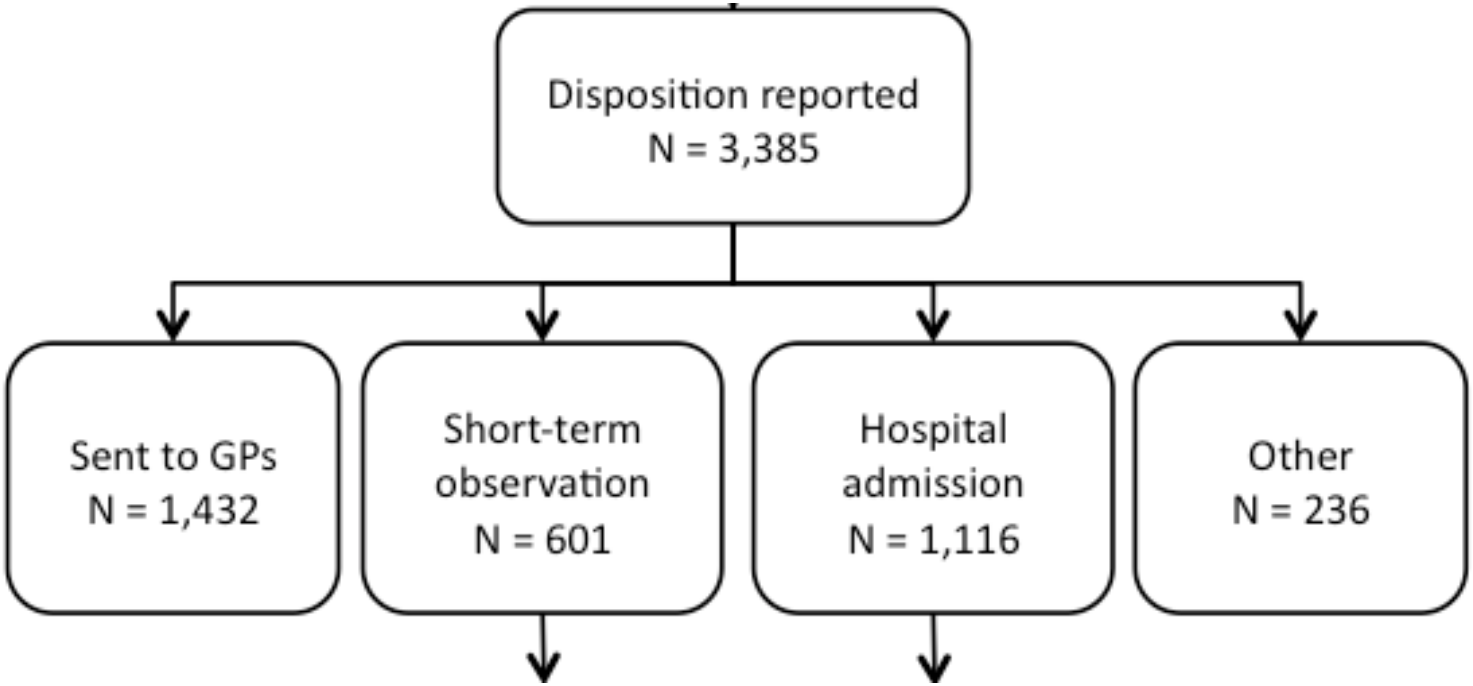
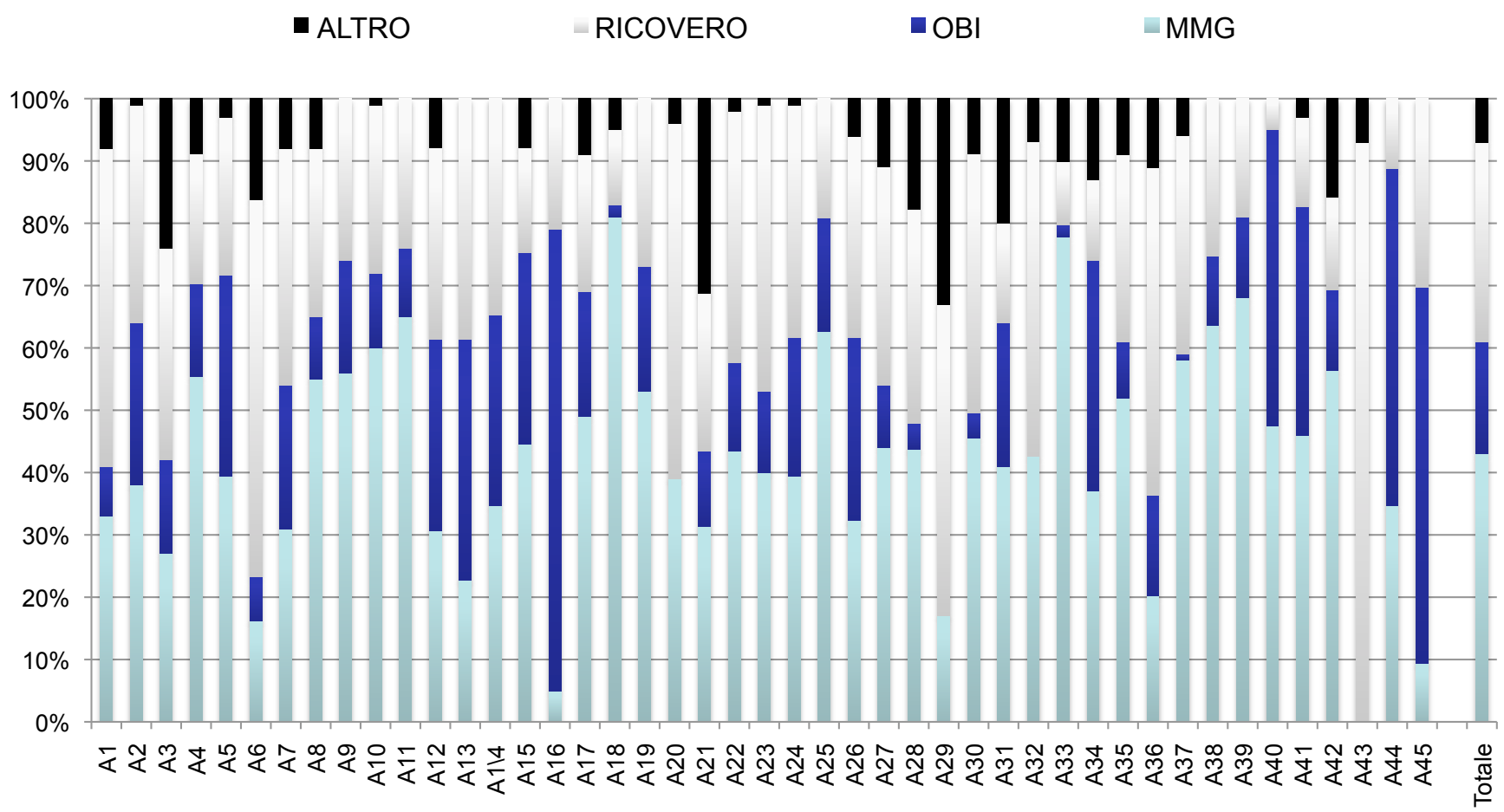
Disposition



- Admitted to different Dept., according to specific conditions and/or local hospital organization (Internal Medicine or Pediatric or Geriatric Dept., 83.2%; ICU or Critical Care Dept., 4.1%; Endocrine/Metabolic Dept., 6.4%; other Dept., 6.2%).
- Five patients died (no death occurred in subjects with traumatic injury or involved in traffic accidents).
- 236 cases (9.0%) either refused admission to hospital or were referred to nursing homes (< 1% of total).

Gestione dell'evento



Factors associated with disposition

vs. GP referral

Variable	Short-term observation (N = 596)	Admittance to hospital (N = 1,116)
Age (years/10)	1.17 (1.10-1.23)	1.51 (1.43-1.60)
Female gender	1.20 (0.99-1.45)	1.10 (0.94-1.28)
*Glucose at event (mg/dL/10)^	0.97 (0.93-1.02)	0.92 (0.88-0.96)
*Insulin use	0.63 (0.51-0.78)	0.51 (0.42-0.61)
*Oral agents	1.55 (1.26-1.91)	1.54 (1.30-1.83)
*Traumatic injury	1.46 (1.04-2.07)	1.27 (0.94-1.73)
*Road accident	2.95 (1.39-6.26)	1.48 (0.64-3.41)
*Malnutrition	1.37 (0.83-2.27)	2.59 (1.76-3.08)
*Cardiovascular disease	0.94 (0.77-1.16)	1.60 (1.34-1.90)

*Data adjusted for age and gender.

^ N= 2,314

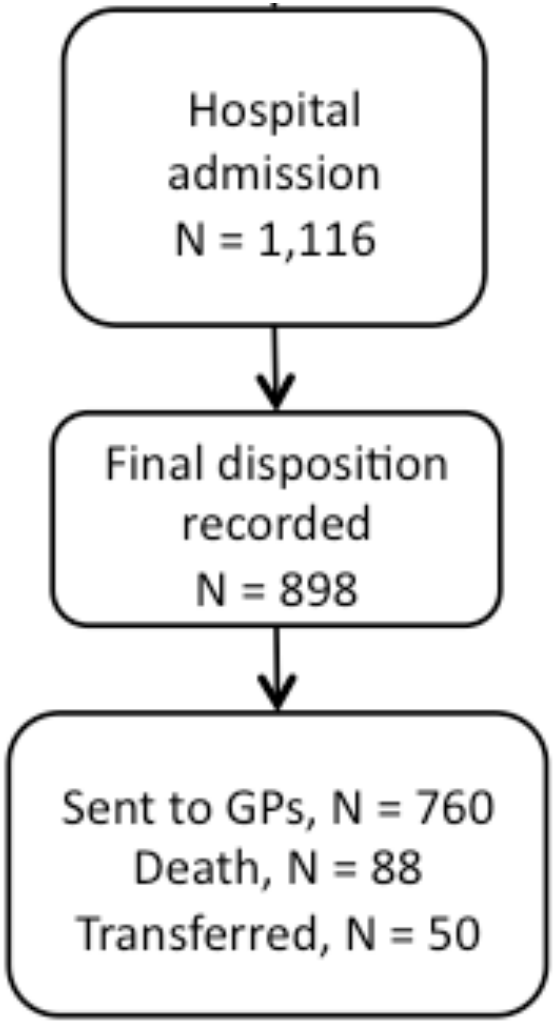
Factors associated with disposition

vs. GP referral

Variable	Short-term observation (N = 596)	Admittance to hospital (N = 1,116)
*Chronic kidney disease	0.94 (0.68-1.30)	1.56 (1.22-1.98)
*End-stage renal disease (dialysis)	0.49 (0.14-1.69)	1.23 (0.57-2.66)
*Cancer	0.98 (0.67-1.41)	1.73 (1.31-2.27)
*Pancreatic disease	1.11 (0.54-2.26)	1.61 (0.91-2.86)
*Chronic liver disease	1.09 (0.64-1.87)	2.13 (1.43-3.17)
*Psychiatric disease	0.99 (0.58-1.68)	1.92 (1.28-2.87)
*Cognitive decline	0.86 (0.57-1.30)	1.45 (1.08-1.95)
*Chronic respiratory disease	0.67 (0.45-1.00)	1.45 (1.11-1.89)
*Parkinson's disease	1.10 (0.56-2.19)	1.79 (1.08-2.97)
*Number of associated complications	0.92 (0.82-1.04)	1.51 (1.38-1.66)

*Data adjusted for age and gender.

Final outcome

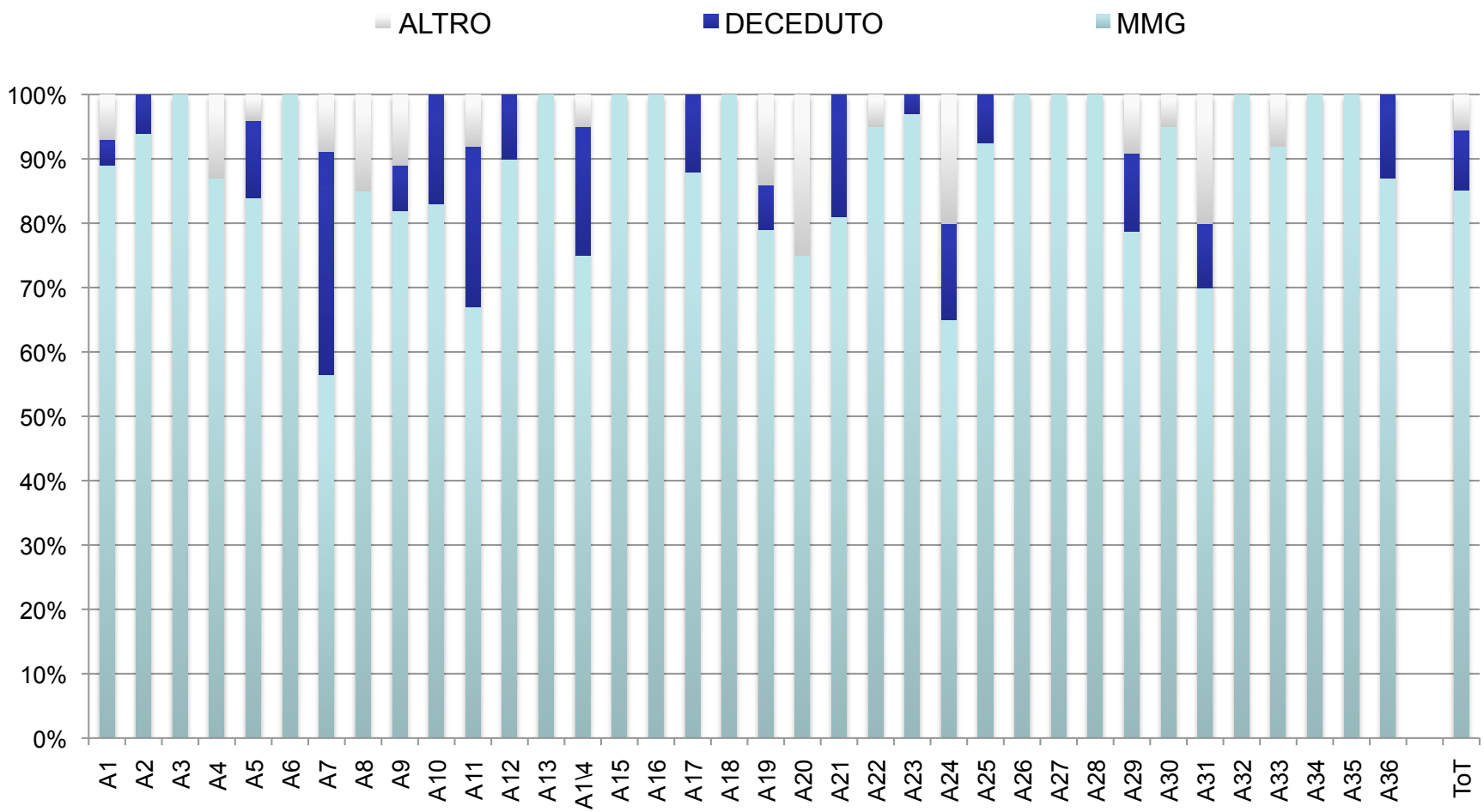


- Median length of stay, 6 days (interquartile range, 7; range 1-80);
- 88 cases (9.8%) died in hospital;
- 50 (5.7%) were transferred to other institutions or nursing homes.

After adjustment for age, in-hospital death was associated with:

- cancer (OR, 1.94; 95% confidence interval (CI), 1.11-3.37; P = 0.019);
- malnutrition (OR, 2.0; 95% CI, 1.02-3.87; P = 0.044), independent of cancer.

Mortalità



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Event rates

- Type of event: hypoglycemia severe enough to indicate immediate attendance to ED or intervention of the out-of-hospital Emergency service (52% of cases) and referral to hospital
- Study area: 12 million inhabitants. The attendance rate for hypoglycemia may thus be estimated around 0.21/1000 inhabitants-year, i.e., 0.6/1000 individuals attending the ED in the same period.
- In Italy (60 million people), nearly 12,000 individuals with diabetes are expected to attend the EDs for severe hypoglycemic events, which require the intervention of out-of-hospital Emergency services in nearly six thousands of cases.

Limitations & Strengths

Limitations

- Retrospective nature of the study;
- Possible underestimation of cases with diabetes, of comorbidities or drug use (particularly for new drugs – DPP4 inhibitors or GLP1 RA, with trade names less known by general physicians operating in EDs;
- No possibility to dissect the type of insulin (basal *vs.* IIT).

Strengths

- Large population covering the whole country;
- Use of hospital-based resources;
- Involvement of colleagues actively participating in ED research.

Conclusions

The study identifies a large number of hypoglycemic events requiring hospital treatment in the diabetes population. They were associated with a significant work-up of the Emergency services, both out- and in-hospital.

The presence, number and severity of comorbidities dictated the disposition and hospital admission, not death rate (very high in the population), probably unrelated to hypoglycemia *per se* but as the result of patients' frailty;

Nearly 50% of cases were treated with insulin, but oral agents were associated in nearly one fourth of cases.

Nearly 30% of cases occurred in non-insulin treated subjects, and in most cases in subject using insulin secretagogues.

The event was associated with a traumatic injury or a road accident in several cases. No inference can be found on a possible casual relationship between hypoglycemia and trauma of road accident on a retrospective analysis, but this possibility is very likely.

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