Short Report: Complications

Multiple complications and frequent severe hypoglycaemia in ‘elderly’ and ‘old’ patients with Type 1 diabetes

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Abstract

Aim Elderly and old patients with Type 1 diabetes represent a growing population that requires thorough diabetes care. The increasing relevance of this subgroup, however, plays only a minor role in the literature. Here, we describe elderly patients with Type 1 diabetes on the basis of a large multi-centre database in order to point out special features of this population.

Method Data of 64,609 patients with Type 1 diabetes treated by 350 qualified diabetes treatment centres were assessed and analysed by age group.

Results Compared with the age group £60 years, patients aged >60 years (n = 3,610 61–80 years and n = 377 >80 years old) were characterized by a longer diabetes duration (27.7 vs. 7.7 years), an almost double risk for severe hypoglycaemia (40.1 vs. 24.3/100 patient-years), a lower level of HbA₁c (60 vs. 67 mmol/mol (7.6 vs. 8.3%)) and higher percentages of microalbuminuria (34.5 vs. 15.6%), diabetic retinopathy (45.2 vs. 8.3%), myocardial infarction (9.0 vs. 0.4%) or stroke (6.8 vs. 0.3%). Elderly patients used insulin pumps less frequently (12.2 vs. 23.8%), but more often used conventional premixed insulin treatment (10.8 vs. 3.8%). Differences between elderly and younger patient groups were significant, respectively.

Conclusion Diabetes care of elderly patients with Type 1 diabetes involves individualized treatment concepts. Increased hypoglycaemia risk and functional impairment attributable to diabetes-associated and/or age-related disorders must be taken into account.


Keywords diabetes complications, elderly/old, hypoglycaemia, Type 1 diabetes

Introduction

The worldwide incidence of Type 1 diabetes, as well as the survival rate of patients with Type 1 diabetes, is increasing [1,2]. Consequently, the population of elderly and old patients with Type 1 diabetes is growing continuously and requires greater attention in diabetes care. Moreover, diabetes treatment in elderly or older patients is complicated by so-called ‘geriatric giants’ such as immobility, instability and impaired intellect and involves the risk of iatrogenic damage. Here, we analysed the multi-centre DPV-Wiss database in order to describe the special characteristics of such patients with Type 1 diabetes in comparison with younger patients with Type 1 diabetes.

Patients and methods

The DPV-Wiss database was established in 1995 by the Institute of Epidemiology and Medical Biometry, University of Ulm, Germany. It has been approved by the local ethics committee. Based on freely available software, it offers a standardized,
Results

Overall, we identified a large subgroup of elderly patients with Type 1 diabetes aged 61–80 years (n = 3610) and > 80 years (n = 377). Compared with younger patients aged ≤ 60 years (n = 60 622), the entire group of elderly patients aged > 60 years (n = 3987) was characterized by an almost double risk for severe hypoglycaemia (40.1 vs. 24.3/100 patient-years) and lower HbA1c levels [60 vs. 67 mmol/mol (7.6 vs. 8.3%)]. Apart from other reasons, the increased risk for severe hyperglycaemia may be connected to a change in insulin treatment.
diabetes and more frequently has microvascular complications, such as retinopathy, neuropathy and/or nephropathy. In our analysis, 40–50% of patients aged >60 years had microalbuminuria or diabetic retinopathy. Besides other endocrine autoimmune disorders and a higher risk for hypoglycaemic events per se in frail, elderly persons with multiple medications and frequent hospitalization [13], the elderly patient with Type 1 diabetes is also threatened by hypoglycaemia unawareness [14–16]. Hypoglycaemia unawareness is especially common in patients with long-standing Type 1 diabetes and is, among other factors, caused by autonomic neuropathy, a desensitized brain because of recurrent hypoglycaemic events, drugs masking hypoglycaemic symptoms and/or so-called geriatric giants [17]. In the study by Munshi et al. [8], 93% of hypoglycaemic events detected by continuous glucose measurements were not recognized by multiple finger-stick glucose measurements [11]. Furthermore, the highly increased rate of severe hypoglycaemic events might also involve an increased risk of acute cardiovascular events. Such a link has repeatedly been shown in patients with Type 2 diabetes [18]. Besides ageing and concurrent chronic conditions, hypoglycaemia might have a role in the high percentage of myocardial infarction and stroke in our patients aged >60 years with Type 1 diabetes.

The factors listed above demonstrate the challenge of treatment and care of the elderly patient with Type 1 diabetes. Accordingly, in our age-dependent analysis of Type 1 diabetes, patients aged >60 years received less insulin pump treatment (12.2%) and more often were given conventional treatment with premixed insulin (10.8%). In contrast, 77% of these patients received an intensive insulin therapy that still requires a very thorough and careful dose adjustment.

Conclusions

Diabetes care for elderly and older patients with Type 1 diabetes particularly involves individualized treatment concepts. The highly increased risk for severe hypoglycaemia and functional impairment as a result of diabetes-associated and/or age-related disorders should be considered. Treatment goals might therefore differ, aiming at HbA1c levels less than 53 mmol/mol (7.0%), or even less than 64 mmol/mol (8.0%), compared with the general recommendation of <48 mmol/mol (6.5%) in younger adults. Overall, the constantly increasing population of elderly patients with Type 1 diabetes requires greater attention that also should include appropriate guidelines and education of social support systems.

Competing interests

Nothing to declare.
Acknowledgments

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References


Original article

Diabetic Medicine