Young-Onset Type 2 Diabetes Mellitus vs Late-Onset Type 2 Diabetes Mellitus: Risk and Prevalence of Diabetic Complications

Sohum Kim*

Division of Endocrinology and Metabolism, Department of Internal Medicine, Inha University College of Medicine, Incheon, Korea

Corresponding Author*

Sohum Kim

Division of Endocrinology and Metabolism, Department of Internal Medicine, Inha University College of Medicine, Incheon, Korea

E-mail: sohum@inha.ac.kr

Received: 30-May-2023, Manuscript No: jdm-23-25155, **Editor assigned:** 02-June-2023, Pre QC No: jdm-23-25155 (PQ), **Reviewed:** 16-June-2023, QC No: jdm-23-25155, **Revised:** 23-June-2023, Revised Manuscript No: jdm-23-25155 (R) **Published:** 30-June-2023, DOI: 10.35248/2155-6156.10001014

Introduction

Type 2 diabetes mellitus (T2DM) is a chronic metabolic disorder characterized by insulin resistance and impaired glucose regulation. While it has traditionally been associated with older adults, there has been a concerning rise in the prevalence of T2DM among younger populations. This has given rise to two distinct categories: young-onset and late-onset T2DM. The age at which T2DM develops can have significant implications for the risk and prevalence of diabetic complications. Understanding these differences is crucial for tailored management strategies and effective prevention efforts [1].

The prevalence and risk of diabetic complications can vary between individuals with young-onset and late-onset T2DM. Diabetic complications can be categorized into microvascular and macrovascular complications, each affecting different organ systems. Microvascular complications include retinopathy, nephropathy, and neuropathy, while macrovascular complications encompass cardiovascular events such as coronary artery disease and stroke [2].

Studies have suggested that young-onset T2DM individuals may experience a higher prevalence of microvascular complications compared to those with late-onset T2DM. This may be attributed to factors such as longer disease duration, delayed diagnosis, and challenges in glycemic control. On the other hand, late-onset T2DM individuals may face an increased risk of macrovascular complications, as age-related factors, lifestyle factors, and longer exposure to metabolic disturbances contribute to their vulnerability [3].

Several factors contribute to the development and progression of diabetic complications in both age groups. Genetic predisposition, lifestyle factors, and metabolic abnormalities play significant roles in shaping the risk profiles. Understanding these underlying mechanisms can help healthcare professionals tailor interventions and provide targeted care to effectively manage and prevent complications.

Recognizing the differences in the prevalence and risk of diabetic complications between young-onset and late-onset T2DM is crucial for healthcare providers. Individualized approaches to screening, treatment, and risk factor management can help mitigate the impact of complications and improve outcomes for individuals in both age groups. By addressing these challenges, healthcare professionals can optimize care, reduce the burden of diabetic complications, and enhance the quality of life for those living with T2DM [4].

In this article, we will delve deeper into the prevalence and risk of diabetic complications in young-onset versus late-onset T2DM. We will explore the contributing factors, underlying mechanisms, and clinical implications, emphasizing the need for age-specific approaches to care. By shedding light on these distinctions, we aim to enhance awareness and promote targeted interventions that effectively address the unique challenges faced by individuals with young-onset and late-onset T2DM in relation to diabetic complications.

Prevalence of Diabetic Complications

Microvascular complications: Microvascular complications of diabetes primarily include diabetic retinopathy (damage to the blood vessels in the retina), diabetic nephropathy (kidney damage), and diabetic neuropathy (nerve damage). Studies have shown that young-onset T2DM individuals may have a higher prevalence of microvascular complications compared to their late-onset counterparts. This increased vulnerability may be attributed to longer disease duration, poorer glycemic control, and delayed diagnosis due to the atypical presentation of T2DM in younger individuals [5].

Macrovascular complications: Macrovascular complications of diabetes involve the cardiovascular system and include conditions such as coronary artery disease, stroke, and peripheral arterial disease. While the prevalence of macrovascular complications generally increases with age, young-onset T2DM has been associated with a higher risk of premature cardiovascular events compared to late-onset T2DM. Factors such as insulin resistance, dyslipidemia, obesity, and a more aggressive disease course may contribute to the increased susceptibility to macrovascular complications in the younger population.

Risk Factors and Mechanisms

Genetic predisposition: Both young-onset and late-onset T2DM have a genetic component, but young-onset T2DM is often characterized by a stronger genetic predisposition. Certain genetic variants may contribute to an earlier age of onset and an increased risk of diabetic complications in young individuals.

Lifestyle factors: Late-onset T2DM is commonly associated with lifestyle factors such as sedentary behavior, unhealthy diet, and obesity. In contrast, young-onset T2DM often presents in individuals who are leaner and physically active. However, the progression of complications in young-onset T2DM may be influenced by factors such as rapid weight gain, psychosocial stressors, and a longer exposure to hyperglycemia [6].

Metabolic factors: Young-onset T2DM is frequently characterized by a more severe metabolic profile, including higher HbA1c levels, poorer glycemic control, and a greater degree of insulin resistance. These factors contribute to an increased risk of complications in this population.

Clinical Implications and Management

The differences in the prevalence and risk of diabetic complications between young-onset and late-onset T2DM underscore the importance of individualized management strategies. Healthcare providers should be vigilant in screening and monitoring for both microvascular and macrovascular complications in young individuals with T2DM, even if they present with atypical features or are initially asymptomatic [7].

Comprehensive management approaches should focus on optimizing glycemic control, blood pressure, and lipid levels, as well as addressing modifiable risk factors such as obesity, smoking, and physical inactivity. Additionally, early detection and treatment of complications, including regular eye and kidney screenings, cardiovascular risk assessment, and neuropathy evaluations, are vital for improving long-term outcomes in both age groups.

Discussion

The prevalence and risk of diabetic complications in young-onset versus late-

onset type 2 diabetes mellitus (T2DM) have important clinical implications. Understanding these differences can help healthcare professionals tailor interventions, optimize management strategies, and improve outcomes for individuals in both age groups [8].

Microvascular complications, including retinopathy, nephropathy, and neuropathy, tend to be more prevalent in young-onset T2DM. This can be attributed to factors such as longer disease duration, delayed diagnosis due to atypical presentation, and challenges in achieving optimal glycemic control [9]. Young-onset T2DM individuals often have a longer exposure to hyperglycemia, which can contribute to the development and progression of microvascular complications. Early and regular screening for these complications, along with aggressive management of blood glucose levels, is essential for reducing the risk and burden of microvascular complications in young-onset T2DM [10].

In contrast, late-onset T2DM individuals may face a higher risk of macrovascular complications such as coronary artery disease, stroke, and peripheral arterial disease. Age-related factors, longer exposure to metabolic disturbances, and lifestyle factors such as sedentary behavior and unhealthy dietary habits contribute to this increased vulnerability [11]. Late-onset T2DM individuals may also have a higher prevalence of comorbidities such as hypertension and dyslipidemia, which further amplify their risk of macrovascular complications. Comprehensive cardiovascular risk assessments, including regular monitoring of blood pressure, lipid levels, and targeted interventions for risk factor management, are crucial for reducing the incidence of macrovascular events in this population [12].

Genetic predisposition plays a role in both young-onset and late-onset T2DM, but the influence may be more pronounced in young-onset cases. Certain genetic variants can contribute to an earlier age of onset and an increased risk of diabetic complications. Understanding the genetic factors associated with each age group can help identify individuals who may be at higher risk and implement appropriate preventive measures and personalized treatments [13].

Lifestyle factors also impact the development and progression of diabetic complications in both age groups. Young-onset T2DM individuals may have a leaner body composition and higher physical activity levels initially, but rapid weight gain, psychosocial stressors, and other lifestyle changes over time can influence the risk of complications. Late-onset T2DM individuals often have a higher prevalence of obesity, sedentary behavior, and unhealthy dietary habits, which can exacerbate their risk. Implementing lifestyle modifications, including healthy eating habits, regular physical activity, and weight management, is crucial for reducing the risk of complications in both age groups [14].

It is important to note that while young-onset T2DM individuals may have a higher prevalence of microvascular complications, the increased risk of macrovascular complications in late-onset T2DM can lead to significant morbidity and mortality. Comprehensive management approaches should aim to address the specific needs and risks associated with each age group, including optimizing glycemic control, blood pressure management, lipid control, and lifestyle modifications. Regular screening for complications, such as eye examinations, kidney function tests, and cardiovascular assessments, should be implemented for both groups to enable early detection and timely intervention [15].

Conclusion

Young-onset and late-onset T2DM represent distinct subgroups with variations in the prevalence and risk of diabetic complications. Young-onset T2DM individuals may experience a higher burden of microvascular complications and an increased risk of premature macrovascular events. Genetic predisposition, metabolic factors, and lifestyle characteristics contribute to these differences. Tailored approaches to screening, prevention, and management that consider age-specific risks and challenges are essential to mitigate the impact of diabetic complications in both young-onset and late-onset T2DM. By understanding these nuances, healthcare providers can optimize care and improve outcomes for individuals living with T2DM across different age groups.

Acknowledgement

None

Conflict of Interest

None

References

1. Gamble JM, Simpson SH, Eurich DT, Majumdar SR, Johnson JA (2010) Insulin use and increased risk of mortality in type 2 diabetes: a cohort study. Diabetes Obes Metab 12: 47-53.
2. Holden SE, Jenkins-Jones S, Morgan CL, Schernthaner G, Currie CJ (2015) Glucose-lowering with exogenous insulin monotherapy in type 2 diabetes: dose association with all-cause mortality, cardiovascular events and cancer. Diabetes Obes Metab 17: 350-362.
3. Nyström T, Bodegard J, Nathanson D, Thuresson M, Norhammar A, et al. (2017) Second line initiation of insulin compared with DPP-4 inhibitors after metformin monotherapy is associated with increased risk of all-cause mortality, cardiovascular events, and severe hypoglycaemia. Diabetes Res Clin Pract 123: 199-208.
4. Mogensen UM, Andersson C, Fosbøl EL, Schramm TK, Vaag A, et al. (2015) Sulfonylurea in combination with insulin is associated with increased mortality compared with a combination of insulin and metformin in a retrospective Danish nationwide study. Diabetologia 58: 50-58.
5. Lempiäinen P, Mykkänen L, Pyörälä K, Laakso M, Kuusisto J (1999) Insulin resistance syndrome predicts coronary heart disease events in elderly nondiabetic men. Circulation 100: 123-128.
6. Ferrara A, Barrett-Connor EL, Edelstein SL (1994) Hyperinsulinemia does not increase the risk of fatal cardiovascular disease in elderly men or women without diabetes: the Rancho Bernardo Study, 1984-1991. Am J Epidemiol 140: 857-869.
7. Atkinson MA, Eisenbarth GS (2001) Type 1 diabetes: new perspectives on disease pathogenesis and treatment. Lancet 358: 221-229.
8. Rabinovitch A (2000) Autoimmune diabetes. Sci Med 7(3): 18-27.
9. Pociot F, McDermott MF (2002) Genetics of type 1 diabetes mellitus. Genes Immun 3(5): 235-249.
10. Pociot F, Akolkar B, Concannon P, Erlich HA, Julier C, et al. (2010) Genetics of type 1 diabetes: what's next? Diabetes 59(7): 1561-1571.
11. Swift PG (2009) Diabetes education in children and adolescents. Pediatr Diabetes 10: 51-57.
12. Brink S, Laffel L, Likitmaskul S (2009) Sick day management in children and adolescents with diabetes. Pediatr Diabetes 12: 146-153.
13. Sargeant LA, Wareham NJ, Bingham S, Day NE, Luben RN, et al. (2000) Vitamin C and hyperglycemia in the European Prospective Investigation into Cancer-Norfolk (EPIC-Norfolk) study: a population-based study. Diabetes Care 23(6): 726-732.
14. Gillis K, Stevens KK, Bell E, et al. (2018) Ascorbic acid lowers central blood pressure and asymmetric dimethylarginine in chronic kidney disease. Clinical Kidney Journal11(4): 532-539
15. Takahashi N, Morimoto S, Okigaki M, Seo M, Someya K, et al. (2011) Decreased plasma level of vitamin C in chronic kidney disease: comparison between diabetic and non-diabetic patients. Nephrol Dial Transplant 26: 1252-1257.

Cite this article: Sohum Kim. Young-Onset Type 2 Diabetes Mellitus vs Late-Onset Type 2 Diabetes Mellitus: Risk and Prevalence of Diabetic Complications. J Diabetes Metab, 2023, 14(6): 1014.