

Case Report

## Remission of Type-2 Diabetes Mellitus in Middle Age Man

Umakanth M<sup>1</sup>, Ethayakumar N<sup>2</sup>

<sup>1</sup>Senior Lecturer in Medicine, Department of Clinical Sciences, Faculty of Health Care Sciences, Eastern University, Sri Lanka.

<sup>2</sup>Consultant Physician, Base Hospital Kalmunai, Sri Lanka

Corresponding Author: Umakanth M

### ABSTRACT

Diabetes mellitus is a chronic, progressive disease with potentially serious consequences. Treatment for type 2 diabetes often begins lifestyle modification with oral agents and ultimately requires insulin therapy. As the disease progresses, drug therapies are often intensified and rarely reduced to control glycemia. The incidence rates of remission and duration for remission is awfully variable. A range of factors seem to influence the remission rates and duration. However, a few studies have demonstrated that drug-free glycemic control can be achieved in type 2 diabetes.

**Keywords:** Type 2 diabetes mellitus; honeymoon period, spontaneous complete remission, partial remission and bariatric surgery

### INTRODUCTION

Type 2 diabetes mellitus is a chronic condition, characterized by persistently elevated level of glucose in the blood. It is more common in adults and increasingly affects children as childhood obesity increases. Uncontrolled type 2 diabetes can lead to chronically high blood sugar levels, causing symptoms complex. There's no heal for type 2 diabetes, but you may be able to manage the condition by balanced diet, exercising and maintaining a healthy weight and appropriate medications if needed. There are two main pathological defects in type 2 diabetes are impaired insulin secretion through a dysfunction of the pancreatic  $\beta$ -cell, and impaired insulin action through insulin resistance. <sup>[1,2]</sup> A growing hard evidence from clinical trials and case-control studies has stated that the remission of type 2 diabetes in certain populations, most remarkably individuals who received bariatric surgery <sup>[3]</sup> for their obesity. However, a randomized controlled

trial among type 2 diabetes, found that bariatric surgery is not the only pathway to heal diabetes, and through intensive lifestyle modification could also cure the diabetes. <sup>[4]</sup> The prevalence of diabetes is growing rapidly worldwide and the World Health Organization (WHO) in (2003) has anticipated that by 2030 the number of adults with diabetes would have almost doubled worldwide, from 177 million in 2000 to 370 million. An expected project that the incidence of diabetes is set to ascend by 64% by 2025, meaning that an overwhelming 53.1 million citizens will be affected by the disease. <sup>[5]</sup> We present a 36-year-old newly diagnosed T2DM patient who presented with hyperglycemic symptoms and HbA1C of 8.2%. He was on initial soluble insulin then switched to metformin and gliclazide for last six months duration. Six months after diagnosis, his HbA1C spontaneously improved to 5.5%. Currently, one year after stopping his

medications he is still in complete remission, not requiring any medication.

### CASE HISTORY

A 36-year-old gentleman with no striking past medical history presented to the hospital with symptoms of polyuria, polydipsia, loss of weight and blurred vision for last 3 months duration. His body mass index (BMI) on admission was 27 kg/m<sup>2</sup>. Patient came with fasting plasma glucose and HbA1C reports, which were 408mg/dl and 8.2% respectively. We arranged blood gas, in order to exclude acidosis. His venous serum bicarbonate was 17 mmol/L, anion gap 22 mmol/L and arterial blood pH 7.25. Urine ketone was normal. We don't have the facility to do GAD antibody and serum C-peptide level. Diagnosis of Type 2 DM with hyperglycemia was made. We started soluble insulin three times a day with metformin and following day we stopped soluble insulin and added gliclazide. The patient was discharged home after clinical and biochemical improvement. Over the next few outpatient follow-up visits, his fasting blood sugar levels were 154mg/dl, 145mg/dl and 156mg/dl. Three months later, his HbA1C was 7.3%. We are optimizing his medication with metformin 850mg three times a day and gliclazide 80mg twice a day and explained the importance of life style modification. Six month later, his blood sugar was under control with HbA1C of 6.4%. Then he started to complain of giddiness and sweating. He started to stop medication himself, first he stopped metformin subsequently he stopped gliclazide as well. For last three months period he was not on any oral anti-diabetic medications. The patient had no symptoms of hyperglycemia. His latest fasting plasma glucose and HbA1C were 5.8mmol/l and 5.5% respectively. We advised him to check blood sugar level at least once in three-month period. His body mass index not changed after six month later.

### DISCUSSION

The rate of remission of recently diagnosed Type 2 diabetes with a course of weight loss and exercise alone is unknown. The American Diabetes Association (ADA) recommends that, upon the diagnosis of type 2 diabetes mellitus, metformin therapy should be administered for normalization of hyperglycemia.<sup>[6]</sup> However an observational study conducted by Philip et al in 2015, which clearly stated that intensive lifestyle program went into at least partial remission defined as an HbA1C of <6.5% thereby delaying the need for hypoglycemic medications.<sup>[6]</sup>

In addition to that, beneficial effects on glucose control also postpone the occurrence of diabetes-related complications remains unknown along with the duration of the partial/complete remission of diagnosed T2DM. As in the case of lifestyle treatment for the prevention of T2DM, effective weight loss maintenance is likely to be a key determinant of the duration of the partial remission.<sup>[7]</sup> However, this patient has achieved complete remission with lifestyle modification and oral medication such as metformin and gliclazide.

Beta-Cell dysfunction is primarily characterized by impairment in the first phase of insulin secretion during glucose stimulation and may antedate the onset of glucose intolerance in type 2 diabetes.<sup>[8,9]</sup> Impairment in first phase insulin secretion may provide as a marker of risk for type 2 diabetes mellitus in family members of individuals with type 2 diabetes mellitus and may be seen in patients with prior gestational diabetes.<sup>[10]</sup> However, impaired first phase insulin secretion alone will not cause impaired glucose tolerance. In type 1 diabetes, the honeymoon period occurs when the residual pancreatic  $\beta$ -cell function is partially restored for an average of 7.2 months. Patients often experience partial remission called "honeymoon phase," which lasts a few months.<sup>[11,12]</sup> with minor requirements of exogenous insulin, as

hyperglycemic stress is removed before the  $\beta$ -cells are ultimately destroyed. [13,14]

In day to day practice, clinicians are often confronted with obese type 2 diabetes mellitus patients for whom the treatment plan fails and who show an inadequate glycemic control or no sustainable weight loss. Bariatric surgery can offer substantial effects on weight loss and significant improvements in obesity-attributable co morbidities including improvement or resolution of diabetes. [15] Bariatric or gastrointestinal metabolic surgery is a promising treatment for inadequately controlled obesity-related T2DM patients with a 77.2% remission rate for associated diabetes. [16,17]

## CONCLUSION

Complete remission is extremely rare compared to partial remission. Pathogenesis of this recovery is not clearly understood. Some hypotheses link this recovery to the possible involvement of IL-10-dependent T-cell regulatory pathways. The honeymoon period has been more extensively studied in the paediatric population. However, an adult with type 2 diabetes, an exact reason for this complete remission is very limited. As an attempt to increase remission rates and beta cell function in patients with newly diagnosed diabetes, many intervention trials are underway. Currently, there is no single gifted agent that is unanimously recommended to improve remission rates.

**Ethics approval and consent to participate:** Not applicable

**Consent for publication:** Written informed consent was obtained from the patient for publication of this case report

**Availability of data and material:** All data gathered during this study are included in this published article.

**Competing interests:** The authors declare that they have no competing interests.

**Funding:** This research received no funding support

## ACKNOWLEDGEMENTS

We thank the patient for accepting the publication of this article.

## REFERENCES

1. State A, Biology E. The pathogenesis and pathophysiology of type 1 and type 2 diabetes mellitus. 2013;4(4):46-57. doi:10.5897/JPAP2013.0001.
2. Adler ML. Clinical Review 102 Type 2 Diabetes Mellitus: Update on Diagnosis, Pathophysiology, and Treatment. 2017; 84(4):1165-1171.
3. Karter AJ, Nundy S, Parker MM, Moffet HH. Incidence of Remission in Adults With Type 2 Diabetes: The Diabetes & Aging Study. 2014;37 (December):3188-3195. doi:10.2337/dc14-0874.
4. Gregg EW, Chen H, Wagenknecht LE et al. Look AHEAD Research Group. Association of an intensive lifestyle intervention with remission of type 2 diabetes. JAMA. 2012; 308:2489–2496.
5. Shaw JE, Sicree RA ZP. Global estimates of the prevalence of diabetes for 2010 and 2030. Diabetes Res Clin Pr. 2010;87:4-14.
6. Philip A. Ades, et al. Remission of Recently Diagnosed Type 2 Diabetes Mellitus with Weight Loss and Exercise. HHS Public Access. 2016;35(3):193-197. doi:10.1097/HCR.000000000000106.
7. Group DPPR. Long-term safety, tolerability, and weight loss associated with metformin in the Diabetes Prevention Program Outcomes Study. Diabetes Care. 2012;35: 731–737.
8. Eriksson J, Fransilla-Kallunki A, Ekstrand A et al. Early metabolic defects in persons at increased risk of non-insulin dependent diabetes mellitus. N Engl Med. 1995;321:690–698.
9. Moole H, Moole V, Mamidipalli A, Dharmapuri S. Spontaneous complete remission of type 1 diabetes mellitus in an adult – review and case report. 2015;9666 (October 2017). doi:10.3402/jchimp.v5.28709.
10. Taylor KW. Pathogenesis of diabetes mellitus. 1960J. clin. Path., 22, suppl.76-81.
11. Mone HOR. Remission Phase in Paediatric Type 1 Diabetes: New Understanding and Emerging Biomarkers. 2017. doi:10.1159/000479030.
12. Artur C, Otto-buczowska E. Remission in Type 1 Diabetes - What's New? Family

- Medicine & Medical Science Research 2015;4(1):8-10. doi:10.4172/2327-4972.1000150.
13. Sierra C. Schmidt, Martha Ann Huey and Heather P. Whitley. Case Study: Remission of Type 2 Diabetes After Outpatient Basal Insulin Therapy. *Diabetes Spectrum* 2016 Feb; 29(1):50-53. doi:10.2337/diaspect.29.1.50.
  14. Abdul-Rasoul M, Habib H A-KM. The “honeymoon phase” in children with type 1 diabetes mellitus: frequency, duration, and influential factors. *Pediatr Diabetes*. 2006; 7:101–107.
  15. Haider A, Haider KS, Saad F. Remission of type 2 diabetes in a hypogonadal man under long-term testosterone therapy. *Endocrinol Diabetes Metab Case Rep*. 2017 Sep 4;2017. doi:10.1530/EDM-17-0084.
  16. Lee W, Chong K, Chen J, et al. Predictors of diabetes remission after bariatric surgery in Asia. *Asian J Surg*. 2012;35(2):67-73. doi:10.1016/j.asjsur.2012.04.010.
  17. Thaler JP, Cummings DE. Mini review: Hormonal and Metabolic Mechanisms of Diabetes Remission after Gastrointestinal Surgery. *Endocrinology*. 2009 June; 150(6):2518-2525. doi:10.1210/en.2009-0367.

How to cite this article: Umakanth M, Ethayakumar N. Remission of type-2 diabetes mellitus in middle age man. *Int J Health Sci Res*. 2018; 8(5):398-401.

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