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CASO CLINICO

Efficacia del sistema MiniMedTM 780G in un uomo adulto affetto da diabete di tipo 2 e da malattia steatosica epatica con disfunzione metabolica (MASLD) severa: un caso clinico

Effectiveness of MiniMedTM 780G system in an adult Type 2 man affected by a severe metabolic dysfunction–associated steatotic liver disease (MASLD): a case report

Pia Salerno[1], Giuseppe Morrone[2], Francesco Catapano[1]
[1]Ambulatorio Diabete e Tecnologie, UO Medicina Interna, Ospedale Guido Compagna Spoke Corigliano Rossano. [2]UO Endocrinologia e Malattie del Ricambio, Arcispedale Sant'Anna, Ferrara.

Corresponding author: **salernopia@libero.it**

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Abstract

Metabolic dysfunction-associated steatotic liver disease (MASLD) is a growing global health issue often associated with Type 2 diabetes (T2D). A good glycaemic control is crucial in managing MASLD, but achieving targets can be challenging. This case report describes a 61-year-old man with obesity, liver cirrhosis due to MASLD/MASH (stage CHILD B), with an episode of hyperammonemia that resolved after starting chronic therapy with rifaximin and lactulose, and T2D treated by multiple-daily injection with a consistent HbA1c >12%. A multidisciplinary approach was adopted, including dietary intervention and the use of an automated insulin delivery (AID) system, the MiniMed™ 780G. HbA1c dropped to 6.5% after one year, while Time in Range (TIR 70-180 mg/dL) improved substantially from 10% to >75% within three months and remained stable at 12 months. MASLD improved, with no further episodes of hyperammonemia controlled with therapy, and an 8 kg weight loss achieved by following a low-glycemic diet. This case highlights the potential of combining an AID system with a dietary program to improve outcomes in patients with severe T2D and cirrhotic MASLD.

KEY WORDS type 2 diabetes; MASLD; time in range; MiniMed™ 780G system.

Riassunto

La malattia metabolica steatosica epatica (MASLD), spesso associata al diabete di Tipo 2 (T2D), rappresenta una crescente sfida sanitaria a livello globale Un controllo glicemico ottimale è fondamentale per

la sua gestione, ma raggiungere i target glicemici può essere difficile. Questo case-report descrive un uomo di 61 anni con T2D in multi-iniettiva, obesità, episodio di iperammoniemia rientrato dopo adeguata terapia con rifamixina e lattulosio e controllo glicemico classificando la MASLD come cirrotica con uno stadio CHILD B, e con un HbA1c >12%. Seguendo un approccio multidisciplinare, comprensivo di intervento dietetico e utilizzo del sistema ibrido avanzato, MiniMed™ 780G, in tre mesi, il Time in Range (TIR 70-180mg/dL) è migliorato dal 10% a >75% e ad un anno il TIR è rimasto stabile e l'HbA1c è scesa a 6,5%. Inoltre l'episodio di di iperammoniemia non si è più verificato grazie alla terapia eseguita in modo permanente e della dieta a basso indice glicemico che ha determinato un calo ponderale di 8 kg. Questo caso evidenzia come le tecnologie avanzate per il diabete combinate con programmi dietetici e compliance terapeutica validi possano migliorare gli esiti clinici in casi complessi di MASLD cirrotica associata a T2D.

PAROLE CHIAVE diabete di tipo 2; MASLD; time in range; MiniMed™ 780G.

Introduction

Metabolic dysfunction-associated steatotic liver disease (severe MASLD progressing to cirrhosis) encompasses fat accumulation (steatosis), inflammation, and, variably, fibrosis of the liver. The global incidence of this condition is increasing, with 38% of all adults currently affected and projections estimating a rise to 55% by 2040[1]. MASLD and its progression to cirrhosis is often associated with metabolic syndrome, which includes obesity, dyslipidaemia, hypertension, and Type 2 diabetes (T2D). To improve the overall health of these patients, achieving weight loss and maintaining good glycaemic control are key strategies. In some cases, a multiple-daily injection (MDI) regimen could be recommended, due to continued high HbA1c despite the use of specific therapies for diabetes that demonstrated efficacy in reducing liver fat and inflammation, such as glucagon-like peptide 1 receptor agonists (GLP-1RAs), thiazolidinediones or sodium-glucose co-transporter-2 inhibitors (SGLT-2i)[2].

The use of automated insulin delivery (AID) systems in insulin-treated individuals with T2D is still limited. However, emerging evidence suggests that switching from MDI to AID can significantly improve Time in Range (TIR, 70–180 mg/dL), reduce Time Above Range (TAR, >180 mg/dL), and lower HbA1c levels[3]. A recent real-world analysis of 10,795 T2D users of the MiniMed™ 780G AID system reported a mean TIR of 75.1%, a mean TAR of 24.3%, and a mean time below range (TBR, <70 mg/dL) of less than 1%[4].

In this paper, we describe the case of a man with severe MASLD associated with T2D who switched from MDI plus metformin to MiniMed™ 780G system, due to a consistent HbA1c higher than 12%.

Clinical case

This case describes a 61-year-old man, SL, with T2D and severe MASLD treated at the Internal Medicine Department of Corigliano-Rossano Spoke Hospital in Calabria, Italy. Clinical data were retrieved from medical records, and glucose data were extracted from the Medtronic CareLink™ Clinic, a dedicated web-cloud platform. The patient provided informed consent for the retrospective publication of his case. Descriptive statistical analysis was performed. In early August 2023, SL was admitted to our Internal Medicine Department. Figure 1 outlines SL's medical history, from his initial diagnosis to the start of his care in our outpatient clinic.

As first step, we proposed a multidisciplinary approach to treat MASLD, diabetes, and obesity. For the management of MASLD with a single episode of hyperammonemia, we prescribed 1100 mg/day of rifamixin and lactitol EPS, with close follow-up every 15 days at our outpatient clinic.

The MDI therapy was immediately modified, and the dosages of rapid- and long-acting insulins were adjusted for balance. To improve glycaemic control and manage obesity, we combined dietary modifications – including a low glycaemic index and low protein diet – with diabetes technology to facilitate glucose monitoring.

On the 28th of August 2023, SL began using the Medtronic Continuous Glucose Monitoring (CGM) Guardian™ 4 sensor. After 2 weeks, a TIR of 10% and a TAR of 90% were revealed. As a result, we recommended that SL begin using an AID system to increase TIR, reduce TAR, and minimize the risk of increasing TBR.

On the 11th of September 2023, SL started to use the MiniMed™ 780G pump in Manual Mode and the total daily insulin dose (TDD) was reduced of 20% (from 148 U to 118 U). After 2 weeks, his TIR improved to

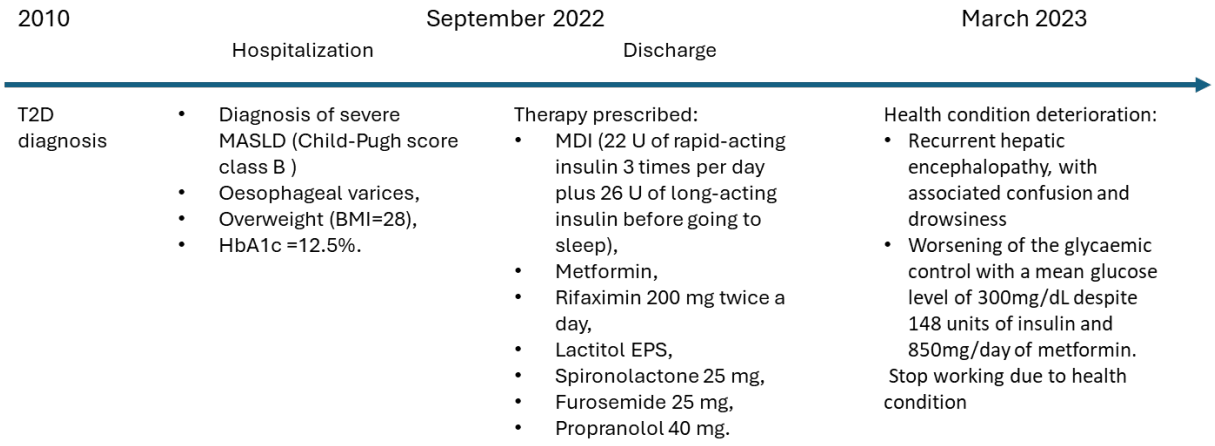

Figure 1 | Clinical history.

22%. In parallel, a nutritionist educated SL on carbohydrate counting to support glycaemic control. Additionally, he was instructed on protein counting to reduce protein intake as part of the management strategy for hyperammonaemia encephalopathy.

On the 24th of September 2023, the SmartGuard™ feature, which automates insulin delivery based on real-time glucose data, was activated. Over the following three months, SL achieved a TIR of 77%, which was sustained after one year of therapy (Figure 2).

After initiating SmartGuard™, the active insulin time (AIT) was set to 2.5 h, and the glucose target was set to 110mg/dL; these were maintained for the whole follow-up period. Follow-up visits were scheduled every two weeks in the first month and every 2 months thereafter.

To evaluate the effect on retinopathy of a rapid increase in TIR with a subsequent decrease in HbA1c, an eyes fundus was performed in May 2024 highlighting angio-sclerosis, with no sign of diabetic retinopathy.

At one-year follow-up (September 2024), SL reached an HbA1c of 6.5%, he lost 8 kg, he has not had any more episodes of hyperammonemia and so he was able to start to work again.

Discussion and conclusion

This case report highlights how an Internal Medicine Department can serve as the primary point of contact for T2D patients on MDI therapy with multiple comorbidities.In particular, the use of advanced diabetes technology, such as the MiniMed™ 780G system can help to reach consensus-recommended glycaemic targets[5], even in subjects with a baseline HbA1c >12%. High adherence to therapy (sensor use >90%) and the autocorrection feature, which mitigates hyperglycaemia, enabled sustained results over one year.

A recent study showed that a therapeutic strategy focused on a tight blood glucose control could help to improve cirrhotic MASLD condition independently of

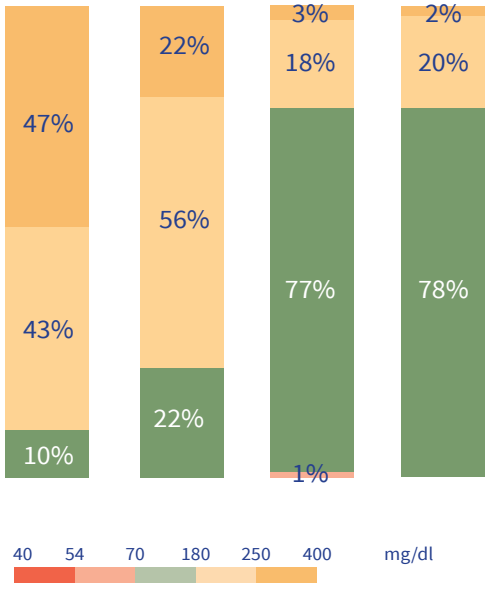

Figure 2 | Changes in CGM metrics during the follow-up. CGM, continuous glucose monitoring; GMI, glucose management indicator; SG, sensor glucose; SD, standard deviation; TDD, total daily dose.

Table 1 |

	2 weeks	4 weeks	3 months	1 year
Type of therapy	**CGM**	**Manual Mode**	**Smart Guard™**	**Smart Guard™**
Sensor use (%)	73	98	98	93
SmartGuard™ use (%)	-	-	100	95
Mean SG (mg/dL)	248	215	144	149
SD (mg/dL)	57	43	50	43
GMI %	-	8.5	6.9	6.9
TDD, units	-	118.6	120.7	128.6
%Basal insulin	-	-	34	24
%Auto-corrections	-	-	27	29
%Initiated boluses	-	-	39	47

overweight and obesity[6]. This finding was consistent with our patient's case, as no further episodes of hepatic encephalopathy occurred after achieving a TIR >75%.
The combined use of the MiniMed™ 780G system and a dedicated nutritional program, including a low glycaemic index and low protein diet, resulted in a 20% reduction in insulin TDD and weight loss from 104 kg to 96 kg within a few months.
In this case-report, MiniMed™ 780G system was safe and helped to reach glycaemic targets and to better control cirrhotic MASLD with complications such as a single episode of hyperammonemia. Further clinical trials should be performed to confirm our findings.

Declarations

Conflict of interest: I hereby declare that all authors of the manuscript "Effectiveness of MiniMedTM 780G system in an adult Type 2 man affected by a severe Metabolic Dysfunction–Associated Steatotic Liver Disease (MASLD): a case report" did not receive support from any organization for the submitted work.
Ethical Standard Statement: The article publication was approved by the ethical committee of Corigliano-Rossano Spoke Hospital – ASP Cosenza, Italy.
Informed consent: Patient written informed consent for publication was obtained.

Bibliography

1. Younossi ZM at al. Epidemiology of Metabolic Dysfunction-Associated Steatotic Liver Disease. Clin Mol Hepatol doi: 10.3350/cmh.2024.0431, 2024.
2. European Association for the Study of the Liver (EASL); European Association for the Study of Diabetes (EASD); European Association for the Study of Obesity (EASO). EASL-EASD-EASO Clinical Practice Guidelines on the management of metabolic dysfunction-associated steatotic liver disease (MASLD). *J Hepatol* 81(3):492-542. doi: 10.1016/j.jhep.2024.04.031, 2024.
3. Borel AL, Lablanche S, Waterlot C et al. Closed-Loop Insulin Therapy for People with Type 2 Diabetes Treated with an Insulin Pump: a 12-Week Multicenter, Open-Label Randomized, Controlled, Crossover Trial. *Diabetes Care* 47(10):1778-1786. doi: 10.2337/dc24-0623, 2024.
4. Thijs I, Arrieta A, Castañeda J et al. Performance of an Automated Insulin Delivery System in People Living with Type 2 Diabetes and Insulin Resistance: first Real-World Evidence in 26 427 Users. *J Diabetes Sci Technol*. doi: 10.1177/19322968251318373, 2025.
5. American Diabetes Association Professional Practice Committee. 7. Diabetes Technology: Standards of Care in Diabetes-2025. *Diabetes Care* 48(Supplement_1):S146–S166. doi: 10.2337/dc25-S007, 2025.
6. Della Pepa G, Lupoli R, Masulli M, Boccia R, De Angelis R, Gianfrancesco S, Piccolo R, Rainone C, Rivellese AA, Annuzzi G, Bozzetto L. Blood glucose control and metabolic dysfunction-associated steatotic liver disease in people with type 1 diabetes. J Endocrinol Invest 47(9):2371-2378. doi:10.1007/s40618-024-02333-2, 2024.