

# Recurrent hypoglycemia in Diabetes Type 1: a case report

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**KEY WORDS:** Diabetes type 1; hypoglycemic episodes; office worker; occupational health

**PAROLE CHIAVE:** Diabete tipo 1; episodi di ipoglicemia; lavoratore d'ufficio; salute sul lavoro

## SUMMARY

**Introduction:** *Insulin as diabetes therapy, if not well accepted by the patient, can worsen life quality and lead to compromised glucose control. Diabetic emergencies, such as hypoglycemia, can occur. According to social responsibility, corporate actions plays a relevant role in supporting the well-being of diabetic workers. Objectives:* To report a case of management of severe recurrent hypoglycemic crises. **Results:** *An advanced tertiary sector office worker (health risks: VDU, organization and stress, no company car use), suffering from Diabetes Type 1 with recurrent severe hypoglycemic crisis during the working time was brought to the attention of the occupational physician. The patient was followed by a high-level specialized diabetic center, but an unusual personality and bizarre ideas on self-regulation of diabetes resulted in rejection of continuous infusion with insulin pump in favor of multiple daily insulin injections therapy. Discussion:* *Advanced tertiary sector, characterized by a space-time expansion of the working time, didn't facilitate acceptance of the regularity in insulin therapy and meals. Company prevention system intervention is useful to achieve a satisfactory balance: social support, availability of a refrigerator for medicines and an infusion pump. Conclusions:* *A constructive action of the "company system" can be useful to provide effective support in the management of diabetic therapy, with real positive implications on health status.*

## RIASSUNTO

**«Ipoglicemie ricorrenti in Diabete Tipo 1: caso clinico».** **Introduzione:** *La terapia insulinica del diabete, se non ben accettata, può determinare un rilevante impatto sulla qualità di vita e comportare problemi nel controllo glicemico. Possono così verificarsi emergenze diabetiche, come crisi ipoglicemiche severe. Nell'ottica della responsabilità sociale, l'azienda può attuare azioni di rilievo mirate a supportare l'equilibrio di benessere del lavoratore affetto da questa patologia cronica. Obiettivi:* Presentare un caso di gestione di gravi crisi ipoglicemiche ricorrenti. **Risultati:** *Giunge all'attenzione del medico aziendale il caso di un lavoratore del settore terziario avanzato (rischi per la salute: VDT, organizzativi e stress, no auto aziendale), affetto da Diabete di tipo 1 con gravi crisi ipoglicemiche ricorrenti in orario lavorativo. Il lavoratore era seguito da un centro specialistico diabetologico di secondo livello; la sua originale personalità e la convinzione di potersi agevolmente auto-gestire nella quotidianità lo avevano portato al rifiuto dell'applicazione di una pompa con infusore continuo di insulina, preferendo continuare con una terapia multiniettiva. Discussione:* *Il lavoro nel settore terziario avanzato, caratterizzato da una dilatazione spazio-temporale del momento lavorativo, non facilita la necessaria regolarità nell'assumere la terapia ed i pasti. Un intervento del sistema della prevenzione aziendale coordinato con gli specialisti diabetologi ha permesso di raggiungere un equilibrio soddisfacente in più passaggi: supporto sociale dei colleghi, disponibilità di frigorifero per medicinali prima e di pompa ad infusione poi. Conclusioni:* *Azioni costruttive del "sistema aziendale" possono costituire un concreto ed efficace supporto per riconciliare la gestione della terapia diabetica e il lavoro, con concrete implicazioni positive sullo stato di salute.*

## INTRODUCTION

Treatment of diabetes type 1 involves, in addition to a specific nutritional intervention, insulin therapy according to the recommended basal-bolus scheme. The therapy can be carried out by multiple daily insulin injections or, in the case of poor glycemic control and /or recurrent hypoglycemia, by continuous infusion with insulin pump (2). Poor compliance of patient could influence the quality of their private and working life. Hypoglycemic crises are particularly important also because they generate considerable apprehension in people who assist diabetic patients, especially if they occur at the workplace.

Education and improvement of insulin therapy play an important role to reduce poor compliance.

According to social responsibility, corporate actions could play a relevant role in the integrated management of support for the physical, mental and social well-being of the diabetic worker.

## METHODS

We reported a clinical case of an employee in the advanced tertiary sector suffering from diabetes type 1 with severe recurrent hypoglycemic episodes during working hours.

Informed consent of the patient included in the study was obtained before the consultation of the medical records. During data collection and analysis, anonymity and privacy were respected.

Family history, personal physiologic, pathological and occupational history and general clinical examination were collected by the company occupational physician, during periodical check for renewing pass-issue. The occupational physician also collected the reports drawn up by company first aid workers, who helped the colleague during the hypoglycemic crisis. Additional investigations such as high-level specialized laboratory analysis were also ruled out.

## CASE REPORT

Female 45 years old, normal weight (58 Kg, Body Mass Index=23.1), non-smoker, office worker in the same multinational company of advanced services

for nineteen years, with the task of "Video Display Unit (VDU) operator" and role of Executive Assistant (health risks: VDU, organization and stress, without use of company car). The diagnosis of "diabetes mellitus type 1" was made at the age of 26 and was confirmed by a high level specialist center. Insulin therapy was started and good glycemic compensation (HbA1c 6.3% - 46 mmol/mol, confirmed by diary with a good preprandial control) was obtained within one year. However the space-time expansion of the working time did not facilitate acceptance of the necessary regularity in therapy and meals, compromising glucose control. The unusual personality of the patient and her bizarre ideas on the self-regulation of her diabetes resulted in wide variations of insulin dosage and in refusal of continuous insulin infusion with insulin pump (recommended by the specialized center for diabetics) in favor of multiple daily insulin injections (5 doses / day). The pathologic history shows a Transient Ischemic Attack (TIA) due to therapeutic mistake when she was 37 years old and a silent heart attack at 43 years of age. No ergophthalmologic and musculoskeletal abnormality was revealed by medical examination.

At workplace, in a short period of time, three episodes of severe hypoglycemia occurred (glucose < 70 mg/dL - 3.88 mmol/L, with unconsciousness), always late in the morning or early in the afternoon. During all the crisis, intervention of both the company first aid workers and the external public first aid were needed. The impact on physical, mental and social well-being involves not only the worker (who minimized and underestimated her situation), but also the work colleagues who were scared and worried. The company first aid team (concerned about the severity and frequency of the interventions), and the company management (worried about collaborator's health and business continuity) were also involved.

Early cooperation between company occupational physician and high-level specialized center for diabetics started and a reinforcement activity in an opportunistic context was planned in order to increase empowerment and to accept treatment indications. The company also facilitated the therapeutic

management of the disease and made available a medical refrigerator (continuous temperature monitoring, connection to the electricity line with a UPS, access limitation by personal code) to keep personal medications in optimal conditions.

A collaboration between the occupational social context, performed by the company health service and prevention and protection service, was also set up. Strong support to the worker was implemented (i.e.: supporting the maintenance of regular times dedicated to the consumption of food avoiding inappropriate overlapping of meetings and / or requests, etc.).

The worker found her own glycemic balance and her well-being; no other hypoglycemic crisis occurred during the working day. After one year, the worker agreed to equip herself with an infusion pump to simplify the management of insulin therapy and to improve glycemic control.

## DISCUSSION

Severe hypoglycemic crises during insulin therapy represent the most important complication of diabetes mellitus type 1 and can lead to death. These events commonly appear at the beginning of therapy or when a change occurs in one daily life; they are closely related to understanding of real needs of the substitution therapy, as happened also in this case report. Educational reinforcements adapted to the age and socio-cultural context of the patient (5) represented the best preventive results in the medium term.

The collaboration with a high-level diabetes center is an excellent opportunity to have an easily available coordinated team offering the best prospective for treating diabetes and its complications (1). However, this was not sufficient in the management of this case. To overcome the criticalities connected to an inadequate management of insulin therapy, the involvement of the company occupational physician allowed an effective and efficient coordination between the general practitioner and the specialist. Appropriate enhancement actions were useful to assure to the best lifestyle and insulin therapy management supporting the worker to accept a continuous infusion pump instead of multiple daily insulin injections.

In this case report the discouragement and depressive implications were effectively counterbalanced by the strong social support received from work organization and colleagues, in synergy with the reinforcement interventions suggested by the corporate prevention system and implemented within the workplace social context.

Psycho-behavioral characteristics have led the worker to not completely accept her situation as a “chronic patient dependent on a therapy” and the diagnosis of type 1 diabetes made in adulthood has contributed to this non-acceptance. The fact of being employed in a company of the advanced tertiary sector created some difficulties for the regularity of meals and therapeutic doses. Companies operating in this sector of activity provide services with high innovative content, directed exclusively for other companies; for the success of this system the human resource is considered crucial, with the need for flexibility, dynamism and adaptability (3). In this work context there is a time-space expansion combined with an increase in social conditioning. An eventual substratum of personal insecurity, aggravated by the fear of losing one’s professionalism, could become critical when regular rhythms of working time are needed, as in the case of insulin therapy. The technological evolution in insulin treatment now provides new, more performing opportunities that are well suited also to this working context (4).

In conclusion, an action of the “company system” provided an useful and effective support to reconcile the management of diabetic therapy and work, with positive implications on physical, mental and social well-being.

NO POTENTIAL CONFLICT OF INTEREST RELEVANT TO THIS ARTICLE WAS REPORTED BY THE AUTHORS

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