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Case Report

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SARS COV-2 INFECTION IN A DIABETES TYPE 1 PATIENT ON CGM: A CASE REPORT

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ABSTRACT

Patients with type 1 diabetes belong to the risk group of patients with COVID 19 infection. Hyperglycemia during hospitalization for COVID- 19 has also been established as a poor prognostic indicator. Some studies report that those with previously poorly controlled diabetes tend to have higher morbidity and mortality. Here we present a patient with type 1 diabetes who was admitted to the intensive care unit with signs of pneumonia and ketoacidosis. We also wanted to show the benefits of CGM in the treatment of such patients due to the titration of insulin therapy and to indicate the reduction of the risk of exposure of medical workers when working in a COVID environment.

KEYWORDS: COVID-19, CGM, Diabetes type1.

INTRODUCTION

Coronaviruses are viruses from the subfamily Orthocoronavirinae, the family Coronaviridae and the order Nidovirales.[4,5] Single-stranded, positively directed RNA genome and helically symmetric nucleocapsid were enveloped. The size of the genome is between 26 and 32 kilobases - the largest for an RNA virus. The name "coronavirus" comes from the Latin word corona, which means "crown" or "halo", and refers to the characteristic appearance of viral particles (virions): they have a rim resembling the crown or corona of the Sun. SARS-CoV-2, formerly known as 2019-nCoV, was first identified in December 2019 in the city of Wuhan in the Chinese province of Hubei when 41 people contracted pneumonia for no apparent cause. On February 11, 2020, the World Health Organization caused a new coronavirus called coronavirus disease 2019, short for COVID-19 (Coronavirus disease 2019). Continuous glucose monitoring (CGM) automatically tracks blood glucose levels, also called blood sugar, throughout the day and night. You can see glucose level anytime**.** A CGM works through a tiny sensor inserted under skin, usually on belly or arm. The sensor measures interstitial glucose level, which is the glucose found in the fluid between the cells. The sensor tests glucose every few minutes. A transmitter wirelessly sends the information to a monitor. In our case patient use freestyle libra CGM system.

CASE PRESENTATION

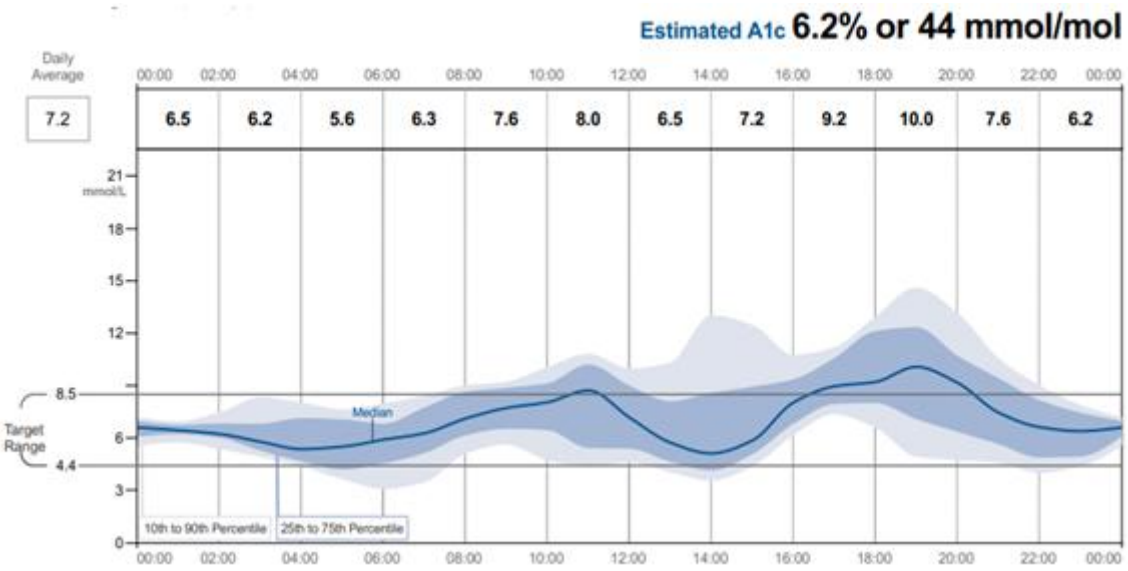
Patient aged 38 years, type 1 diabetic back 19 years. 3.5.2021. hospitalized in the intensive care unit of the UCCRS. The patient was on intensified insulin therapy Novorapid 5 + 6 + 5 IU s.c., Tresiba 21 IU s.c. Difficulty on admission: weakness, malaise, pain in the lumbar region, nausea, shortness of breath, subfebrile.On admission, low-dose lung CT was performed: CORADS 5B finding. Laboratory data are reported in Table 1.Therapy in the Intensive Care Unit: Methyl prednisolone 80mg 1x1, Meropenem amp 1g 3x1, Vancomycin amp 1g 2x1, Controloc 40mg 2x1, Enoxaparin 0.6 ml 1xs.c. Insulin treatment: 6… 4… 2 IU / h continuous insulin therapy - for 3 days. 5.5.2021 the patient is transferred to the COVID departments, where the administration of therapy started in the intensive care unit continued, Insulin therapy: continuous insulin th - insulin aspart 2 IU / h. On May 6, 2021, the patient stopped applying continuous insulin therapy and therapy was introduced: insulin aspart 8 + 10 + 10 (inverse ratio due to the expected increase in glycemia in the afternoon caused by corticosteroid therapy), Insulin degludec 26 IU s.c. at 9 p.m. From 6 to 12.5 changes in insulin degludec dose to 30 IU s.c. at 9 p.m. The change in insulin aspart doses per day is shown in Table 2. Since no respiratory symptoms were reported, the patient was discharged on May 12, 2021, in good general condition, recovered, afebrile.

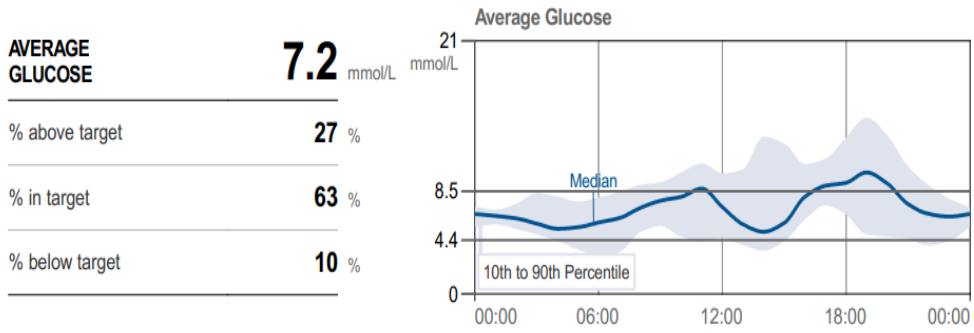
Table 1: Laboratory findings are shown in the table.

	3.may.'21.	5.may.'21.	11.may.'21
WBC	21.14	7.19	6.89
RBC	4.15	3.06	3.52
HGB	142	106	120
HCT	0.43	0.30	0.35
PLT	236	145	422
Glucose	23.2		
CRP	164	59.1	2.8
Creatinine	114	100	85
pH	7.034	7.389	7.40
pO2	112	9.7	12
pCO2	12.6	3.05	5.2
ABE	-18.9	-9.5	-1.1

Table 2: Change in insulin aspart doses per day.

7.5.2021.	10+14+14	
8.5.2021.	10+14+14	
9.5.2021.	10+12+12	reduced dose of corticosteroids on 60mg
10.5.2021.	10+12+12	
11.5.2021.	8+10+10	reduced dose of corticosteroids on 40mg
12.5.2021.	8+10+10	
glycemia attached to the CGM chart, dose adjusted according to CGM reports (diagram below)		





TIR set from 4,4 to 8,5 mmol/l , 63%
TAR 27%
TBR 10%

DISCUSSION

Corticosteroids, as one of the main therapeutic components in the treatment of SARS COVID 19 caused by pneumonia, have been shown to have a negative effect on the glycoregulation of patients with DM. During the clinical practice of treatment of patients with covid 19 pneumonia, treatment with high doses of methylprednisolone leads to an increase in glycemia in the afternoon and evening, respectively. In order to provide adequate glycemia 24 hours, it is necessary to adjust the doses of short-acting insulins for the afternoon and evening meal in the titration of insulin therapy, with the often necessary additional 4th dose of short-acting insulin in the evening. The patient who had laboratory-verified ketoacidosis after admission to the hospital after treatment with continuous insulin therapy, used long-acting basal insulin (insulin degludec) and 3-day short-acting insulin in 3 daily doses with increased evening doses of insulin. partial reduction consistent with a reduction in the therapeutic dose of corticosteroids.

CONCLUSION

Proper titration of long-acting basal insulin provided adequate fasting glycemia without major changes in insulin dose. The TIR limits are set from 4.4 to 8.5 mmol / l, and a TIR value of 63% is still provided, with an expected higher TAR percentage of 27% and a lower TBR of 10%. We can conclude that for the required stable adequate glycemia within 24 h with as little glucovariability as possible, it is necessary to increase the noon and especially evening dose of short-acting insulin compared to the morning, due to the expected counterinsulin effect of corticosteroids more pronounced in the afternoon and evening.

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