

## COVID-19 Pneumonia Patient with Type 2 Diabetes Who Switched from Subcutaneous Insulin Injection Therapy to Intravenous Insulin Infusion Therapy: A Case Report

Soichi Takeishi\*<sup>†</sup>, Tatsuo Inoue

Department of Diabetes, Inuyama Chuo General Hospital

### Abstract

Coronavirus diseases 2019 (COVID-19) has been spreading globally. Mitigating its spread, as well as better understanding how it complicates other clinical conditions, are both important. It is unclear which treatment, intravenous insulin infusion (IV) or subcutaneous insulin injection (SC), is preferable for moderate COVID-19 pneumonia patients with diabetes, thus, we herein report the case. In the present case, switching from SC to IV decreased glucose levels while reducing insulin dose, that improved vital sign temporarily. We experienced the case suggesting that medical management using SC may be difficult for moderate COVID-19 pneumonia patients with diabetes.

**Keywords:** COVID-19 pneumonia, diabetes, intravenous insulin infusion, subcutaneous insulin injection

### Introduction

SARS-CoV-2 and the associated infection, Coronavirus Disease 2019 (COVID-19) has been spreading globally, following the initial outbreak in Wuhan, China, in December 2019<sup>1)</sup>. The World Health Organization (WHO) declared COVID-19 to be a pandemic on March 11, 2020<sup>2)</sup>. The COVID-19 pandemic has continued since, and mitigating its spread, as well as better understanding how it complicates other clinical conditions, are both important in improving management of COVID-19 and other affected conditions.

It has been reported that patients with type 2 diabetes mellitus (T2DM) have a higher risk of hospitalization to treat infection than do those without diabetes<sup>3)</sup>. The migratory ability, adhesive ability, phagocytosis, and sterilization ability

of polynuclear neutrophils decrease in patients with diabetes<sup>4)</sup>. It has been reported that hyperglycemia on admission in patients hospitalized to treat pneumonia increased complications during hospitalization and risk of death<sup>5, 6)</sup>. It has also been reported that hypoglycemia and glycemic variability are associated with mortality in non-intensive care unit hospitalized infectious disease patients with diabetes mellitus<sup>7)</sup>. Regarding severe acute respiratory syndrome (SARS) caused by coronavirus (SARS-CoV), which was spread in 2003, it was reported that having diabetes or hyperglycemia on admission independently increased the risk of death<sup>8, 9)</sup>. Regarding COVID-19, it has been reported that diabetes is associated with severity of infection<sup>10-14)</sup>, and therefore, appropriate glycemic control and dia-

\* Address : Department of Diabetes, Inuyama Chuo General Hospital, 6, Futagozuka, Goromaru, Inuyama, Aichi 484-8511, Japan  
TEL : +81-568-62-8111 FAX : +81-568-62-9289 E-mail : souichi19811225@yahoo.co.jp