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Challenges and Management of Diabetes Mellitus Patients during COVID-19: literature review

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APPROVAL

This project paper, Challenges and Management of Diabetes Mellitus Patients during COVID-19: literature review, submitted to the Department of Pharmacy, Faculty of Allied Health Sciences, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of Bachelor of Pharmacy and approved as to its style and contents.

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Declaration

I hereby declare that this project report, Challenges and Management of Diabetes Mellitus Patients during COVID-19: literature review, is done by me under the supervision of Mohammad Touhidul Islam, Lecturer, Department of Pharmacy, Faculty of Allied Health Sciences, Daffodil International University. I am declaring that this Project is my original work. I also declare that neither this project nor any part thereof has been submitted elsewhere for the award of Bachelor or any degree.

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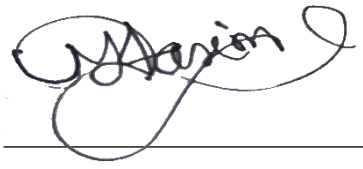

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Author

Dedication

This project work is dedicated to my respective parents and teachers for their support and help and all of my well-wishers.

Abstract:

Diabetes is a lifelong sickness and it is a team of metabolic sickness characterized via excessive ranges of sugar in blood. It is triggered due to deficiency of insulin or resistance to insulin or both. There are distinction sorts of diabetes. Type 1 and kind two are the most frequent diabetes. High blood sugar damages organs and tissues. Uncontrolled excessive blood sugar can be complication related with diabetes include: coronary heart diseases, coronary heart attack, stroke, hypertension, neuropathy etc. Diabetes mellitus is one of the most indispensable hazard elements for complications and death in COVID-19 patients. The current goals to highlight the challenges that are sufferers dealing with this COVID-19 and how an affected person can control these challenges.

Keywords; Diabetes, COVID-19, Challenges, Insulin, Diseases.

Table of Content

List of Tables

List of Figures

Introduction:

First of all, we have to comprehend what diabetes is. Diabetes is one short of disorder in which our sugar in the blood stages is too tall. The ingredients we eat are glucose. Insulin is a hormone that helps human cells to absorb carbohydrates to generate energy (1). Diabetes mellitus is a metabolism causing high blood sugar levels, usually called diabetes. The hormone insulin shifts sugar from the blood into our cells to be reserved or used for stamina. With diabetes, our physique both does not make enough insulin or can't actively use the insulin it does make (2). The COVID-19 pandemic situation was officially declared on March 12. All preventative clinical activities, such as foot clinics (foot screening and perfusion pressure measurement), have been suspended through the Government's decree and thoroughly resumed after May 15, 2020. Despite the powerful second wave, which started in mid-August, the ambulatory foot clinic in the Medical University center has due to the fact operated daily, with no limitation has two full-time nurses, one part-time nurse, and one full-time paramedic physician, diabetologist (3,4). The Health Center all foot ulcers were treated, and the clinic stayed open sufferers who have now not been in contact with COVID-19 all through the lockout duration except signs and symptoms or symptoms. Strict measures to restriction contamination extension have been added: accurate the appointment schedule, health circumstance questionnaire, and prior to the measurement of body temperature entering the health center as well as the minimum distance 1.5m between the waiting room's sofas. Imaging and laboratory testing procedures, microbiology testing, instant vascular diagnostic, therapeutic procedures, and instant surgical procedures are resistible (5). Telephone and e-mail consultations were made available decrease the number of patients who are expected to attend the health institute. Diabetes mellitus is one of the most common causes of illness in the globe and is expected to grow significantly in the coming decades. Several investigations have been conducted exhibited higher diabetics

are more susceptible to certain infectious infections, like *Staphylococcus aureus* and Mycobacterium tuberculosis, 7-9 apparently owing to the deregulated immune system. It has indicated that plasma glucose levels and diabetes are uncommitted determinants of mortality and calamity in patients with SARS. In Wuhan, a retrospective investigation was conducted, China, transpired approximately 32 percent of COVID-19 patients had underlying illness, and diabetes accounted for 20% of total. As a consequence, these diabetes persons have greater COVID-19 susceptibility, and just have a worse prognosis. (6,7). Millions (5% to 15% of the world's population) of individuals annually experience influenza, resulting in excessive respiratory mortality between 300 000 and 600 000 people. In China alone, the annual mortality rates associated with influenza are estimated to be over 88 000 people a year, probably more than any possible 2019 outcome of coronavirus disease (COVID-19). Whatever the potential of COVID-19 propagation, diabetes is a major factor of risk for adverse events as for influenza-related deaths. In the Hong Kong age of 75, death rates of people who have diabetes and over pneumonia are currently higher than death rates of the cardiovascular and cancer age category. The eight-uniform risk document among persons with diabetes, which affects over 8,000 people in 2012, mostly Asian and Middle East Respiratory Syndrome (PERS) and more than 2,000 more, mainly Saudi Arabia, two previous Covid infections have been documented, Severe Audio Respiratory Syndrome (SARS). Widely-spread anecdotal evidence in connection with the present coronavirus disease 2019 (COVID-19) indicates that OGTT is increasingly not recommended or endured by both clinicians and pregnant women. This is based on legitimate travel concerns, possible two trips and the time that is spent in the possibly infectious environment of the specimen collecting centers. Moreover, a GDM diagnosis usually entails additional diabetes education visits to health care services, glucose monitoring, and fetal ultrasound, which all pose a pandemic exposure risk. In reaction to

these concerns, expert societies from the U.K. (1), Canada (2), and Australia (3) have released imperative statements of advice/instruction for modification of GDM diagnostic pathways throughout the COVID-19 pandemic. In fact, in the meantime, diabetes is known to deteriorate the results of other same viral infections as the SARS-CoV or H1N1 infection, for example, in 2003. But not surprisingly, the high transmission rate and the global prevalence of diabetes for SARS-CoV-2 is alarming. Diabetes is the world's leading non-communicable and chronic pandemic disease, with aro1/2 a billion humans affected. Guo W et al. describe Covid-19 mortality amongst humans with diabetes and about 16 percentage except any different comorbidities. Therefore, we must stop SARS CoV-2 spread quickly and prepare ourselves for the worst scenarios by learning far more about the factors that predispose diabetes patients to Covid-19 progression (8–10).

Various datasets from China, Italy, and the United States have repeatedly said that in patients with predatory and previously occurring comorbidities, mainly diabetes mellitus (D.M.), hypertension, and cardiovascular illness, the COVID-19 clinical course is more serious. The affiliation between D.M. and COVID-19 is bidirectional. In one sense, D.M. might also be speedy the chance of acquiring SARS-CoV2 and spreading the virus inextricable the clinical course of COVID-19, as a result, the severity and mortality of the disease will grow. SARS-CoV2 on the other hand, due to decreased insulin secretion or deterioration of glycemic control in subjects with previously non-diabetic D.M., pancreatic islets are attacked and cause acute insulin-related D.M. patients are most likely to have a substantial worsening of their glycemic control after SARS-CoV2 infection. They ultimately want medical instruction to make necessary adjustments to their anti-diabetic therapy repel glycemia that is uncontrolled. D.M. patients are confronted with considerable problems concerning the problematic pandemic situation, following the direct risk of infection, similar to patients with different chronic disorders, and a lack of optimized health

services, and a lack of available medical resources. The COVID-19 pressure saturates and checks on health methods and interrupts delivery and kibbles because of the large number of affected cases. The administration in the duration of the COVID-19 pandemic can due to this fact be difficult to sufferers with diabetes mellitus (D.M.). Even when they are not infected, they are in danger of being dysregulated because of restrictive measures that jeopardize and interfere with healthcare. In the case of an infection, the risk of developing exquisite complications is increased for people with D.M. regular glucose monitoring, patient-tailored therapy approaches, and adherence to medical guidelines are all recommended on lifestyle adjustments and drug treatment are all critical principles of effective care for blonde outpatient cases. Secure glucose, hydration, electrolytes, pH and blood ketones are all monitored are crucial for seriously unwell patients in hospitals to achieve the best possible results. No equal increased danger to seriousness and mortality of COVID-19 occurs in all patients with D.M. The high-risk phenotypes within the D.M. demography is determined by specific clinical and biological traits, and such prognostic markers should be described in future investigations. More study is needed to identify sub-groups of D.M. patients who are most likely to benefit from individual antiviral, immune modulatory and other treatment strategies relating to patient-specific precision medicine, which is an urgent need for COVID-19 patients. Clinical care varies depending on their condition B.G. levels and medical recommendations. We take advantage of the B.G. goals for inpatients by using the American Association of Clinical Endocrinologists and American Diabetes Association, 7.8 mmol/L for pre-prandial B.G. and 10.0 mmol/L for postprandial B.G., as the cutoff standard. Certain ethnical African Americans, Hispanics, Asians and Native peoples are only a few examples quite susceptible to D.M. as well as differences in fitness recreation make these corporations over attackable. It is urgently required for clinical and biochemical parameters to be identified using multi-omics

pathways which predict the COVID-19 severity in D.M. The humanized ACE2 (hACE2) mice and nonhuman monkeys have been studied have looked at the warranty of D.M. attacking COVID-19 and the ability of vaccines and investigational antiviral agents presently being tried for the understanding of hyperglycemia, hyperinsulinemia, and hypoglycemic drug attacks. Lastly, our patients with D.M. should be given new means of providing anxiety by remote monitoring, telehealth, and wearable technology. The social isolation measures are in likelihood to transition as the pandemic unfolds and spreads around the world swiftly throughout the United States. However, basic and clinical research are urgently needed to solve the many important and unanswered concerns (11–16).

The pandemic of coronavirus disorders the year 2019 (COVID-19) has arrived put a healthcare systems and intensive care unit (ICU) resources are under considerable demand. around the world. The advanced period is a well-known a danger factor for the onset of a serious illness, but obesity's impact on illness severity has not been properly investigated. In Swine flu pandemic and other respiratory viruses, obesity was linked to rapid severity and mortality. Obesity (defined as a BMI of 30 or more) was found to be significantly linked to increased hospital and critical care admissions, according to lighter and colleagues. Simon net and colleagues discovered that excessive obesity was linked to a higher risk of heart disease the immediate necessity mechanical ventilation is an example of this, however, there are several exceptions is a scarcity of information about the effects of obesity in Asian people. Because of differences in adipose tissue with fat distribution, Asian demography is known to have increased sickness risks at lower BMI thresholds. In our multi-ethnic Asian community in Singapore, we expected that a low. BMI cutoff levels are associated with serious symptoms of COVID-19 disease. In a retrospective study of 182 patients with laboratory confirmed COVID19, the National Center for Infectious

Disorders in Singapore conducted (by polymerase chain reaction assay). All patients signed a written consent form (Study Reference 2012/00917, authorized by the Hardware Description Advisory Committee of the National Healthcare Group). The finding of the research investigators gathered clinical data from medical records. Ninety-one patients were omitted from the study because neither their height nor weight had been reported. Requires hypoxia supplementary oxygen, ICU admission, mechanical ventilation and fatality was all considered unfavorable outcomes. A BMI with 51 (56.0%) was selected as the research demographic of less than 25, 29 (31.9%) had a BMI of 25 to 30, 7 (7.7%) had a BMI of 30-35 and 4 (4.4%) had a BMI of more than 35. When all era groups were considered, there between individuals with a BMI of 25 and those with a BMI of 25, there have been no big variation in confounding factors or survival rates. However, same according to Lighter's and colleagues' results, a sub-group exploration of patients aged BMI~25 has been determined to be <60 years of age importantly on admission, low-flow supplementary oxygen (OR 6.32,95 percent Cl 1.23 – 32.34) and mechanical ventilation (OR 1.16,95 percent Cl 1.00 – 1.34) were linked with pneumonia on plain radiographs (p-value = 0.017). A BMI of 25 was also linked to importantly elevated expression of blood lactate dehydrogenase (p-value = 0.011), which was linked to disorder COVID-19 has a high level of severity (17,18). In recent months, several findings from foot clinics have been made public. All of them have a universal character much a smaller number of clinical visits and the adoption of telemedicine in diabetic foot care. The "tale of two cities" shows almost 50% drop-down visits to Manchester (3 million inhabitants) and almost 70% drop-downs in Los Angeles (10 million inhabitants in the USA) after lockdown. In the run-down period (January 1, February 1), there were two clinical tripping sessions per capita in Ljubljana University Medical Centre. These visits were nearly three times more per capita than in the province of Manchester and Los Angeles. The total number of contacts to the

clinic fell with 58 percent during the interval of lockdown (March 1-April 1), owing to a significant fall in foot screening and foot ulcer visits. Requirement visits have fallen respectively by 42 and 34 percent. The numbers increased over the following months, with foot-screenings more than doubled in August 2020 than in August 2019. However, the 2019 figures were not reached, except for foot ulcers and emergency visits. Patients who have lost them protective sense is more likely to develop foot ulcers and are more likely to ignore the warning indications of ulcers and infection. Regular foot screening is critical in preventing ulcers, and reasonable access to foot clinics is required for professional limb survival and tissue repair. Locking down foot clinics and suspending all preventative and therapeutic measures could have unintended long-term implications, such as an increase in the frequency of complicated foot ulcers and the highest amputation rate. Early studies have shown that approximately 25 percent of people with severe COVID-19 infections have diabetes in hospitals. Diabetes people were more likely to be at risk and die from the virus (19–23).

The fever is one of COVID-19's clinical symptoms, shortness of breath, diarrhea, muscle discomfort, exhaustion, and smell lost and taste lack are some of the symptoms. The SARS-CoV2 neuronal involvement reports on the taste, smell, hearing loss and neuropathic pain of COVID-19 have been highlighted pneumonia suffers. In a study of 214 patients, 36 percent showed neurological symptoms that were linked to more serious conditions disease with a higher death rate. There is a vast array of neurological problems that were described, including acute cerebrovascular disorder, impaired Guilain-Barre syndrome, ataxia, seizures, skeletal muscle damage and neuropathic pain, together with awareness, meningitis, and encephalopathy. The inclination of coronaviruses (Co-V) SARS-CoV1 and MERS-CoV have been shown to impact neurons. MERS-CoV infection in transgenic mice has been demonstrated. administered intranasal, enters the brain through the olfactory

nerves and the brainstem spreads receive signals quickly. There's also proof that Co-V can invade the peripheral nerves first endings and obtain access to the Central Nervous System through a pathway involved to the synapse. Antigens from viruses have been found in the nucleus of the reticular formation and even in the brainstem in the phrase "enigmatic nucleus" refers to a genome that also is unexplained that received sensory input from Send efferent mechanoreceptors and chemoreceptors fibers to the smooth muscle of the airways and the glands of the lung and respiratory tract, this may result in cardiorespiratory failure and death. COVID-19 illness has been demonstrated to cause higher serious issues in diabetic individuals with microvascular disorders, and that they might be susceptible to developing or deteriorating neuropathy. The new CORONADO study found that, independently of death, the existence of microvascular complications was related with the death of seriousCOVID-19 in 7 days. Diabetic polyneuropathy (DPN) affects more than 50% of the diabetic population and effect of nerve fibers both big and little. Quantitative sensory tests (QST) allow quantitative assessment of pain perception thresholds for vibration, cold, heat, and heat. Previously, The Nerve Check Master has been used to quantify local and big nervous fiber dysfunction in individuals with diabetic neuropathy using a simple quantitative sensory testing equipment. In this early report, the complete neurological presentation is described and quantitative sensory tests are conducted on the feet and face and taste and odor in four diabetic patients who had serious condition. COVID-19 (24). Diabetes mellitus is usually a significant risk factor for serious pneumonia and septic disease caused by viral infections. Data from early COVID-19 research reveal that COVID-19 death rates in persons with DM up to 50 percent greater than in those without COVID-19 are greater. While pathophysiological reasons are still poorly known, it is noted that in older people or individuals with CBD, diabetes, chronic Lungs- and kidney diseases, hypertension, and cancer, the bulk of severe and fatal cases with COVID-

19 have occurred. Results from a recent meta-analysis showed that hypertension (17.1%, 95% CI, 9.9-24.4%) and cardio-cerebrovascular diseases (16.4%,95% CI) and DM (16.0%, 95% CI, 6.6 to 26.1%) were prevails in cardiovascular metabolism with COVID-19 (9.7 percent, 95 percent CI 6.9-12.5 percent). In this report, the risk of severe disease and the need to receive an Intensive Care Unit (ICU) was two-fold greater for D.M. or hypertension patients. D.M. patients. Hosts are vaccinated because of immunological malfunction associated to infection ability. The course of infection, possibly because to these immune deficiencies, is likewise increasingly complicated. These include abnormalities to the proliferation of T cells and macrophages and damage to the activity of lymphocytes and B cells. This results in abnormal innate and adaptive immunity. Observing better glycemic control is an effective refuge to management the transmission of COVID-19 in diabetic patients. However, in Zimbabwe, as in many other nations, the imposition of social distance and closure has resulted in institutional and personal managing obstacles for D.M. in order to halt the development of Sars-Cov-2. Many people with D.M. have difficulty accessing drugs, medical care, fresh food, and physical activity due to confinement. Healthcare workers (mainly nurses and doctors in Zimbabwe) must disseminate adequate and Precise self-care advice for people with D.M. in the context of COVID-19. In nations with an excess manifestation of diabetes, like India, the professional focused pandemic of COVID-19 was questioned refuge to D.M. care that relies on starters on the daily round of hospital visits. The display of D.M. in Zimbabwe is 9.7 percent and D.M. is the sixth leading death cause, accounting for 3.02 percent of all Zimbabwe's death in 2018. It is also worrisome that more than 60 percent of D.M. cases are undetected in most low-income nations, even Zimbabwe. A considerable part of the population is therefore at higher risk for diabetes complications and virus Sars-Cov-2 infection. Therefore, the subject of this investigates is

to cultural documentation appropriate self-care way for people with D.M. in resources during the ongoing pandemic of COVID-19 (25,26).

1. Challenges in diabetes mellitus management during COVID 19:

COVID-19 was the pandemic situation in the whole world. Lockdown was affected many people with many physical diseases. So those during COVID-19, many diabetes patients face many challenges for control their diabetes. Those challenges were convenient for them.

1.1 Diabetic Ketoacidosis in COVID 19:

Diabetes has been identified as common comorbidity in the COVID-19 pandemic and is linked to greater complication and death levels. In COVID-19, as with other severely affected patients with type 1 diabetes and in patients with type 2 diabetes, diabetic ketoacidosis was reported. Following the first Chinese studies that reported a broad diabetes prevalence from 7.4 percent to 19.5 percent, A higher incidence among people who required or who died was documented by various investigations. Italian data showed a frequency of diabetes among 35.5% of individuals who had died more significant than three the overall population times. In Chinese cohorts, Care for ICU required more

frequently for sicker with diabetes, and respiratory illness acute was 2.34times greater at the 95% confidence interval. As expected, due to the increase in deaths too was greater complications. In a read from Wuhan, 191 people had an OR of 2.85 compared to a non-diabetic group for patients with diabetes. While high disease severity, organ failure, and mortality are reported among adults with diabetes, what is less known are the specific metabolic complications of COVID-19? The opinion is well-known about viral infection and the link with diabetes. For example, viruses such as cytomegaloviruses have long been involved in enhancing Type 1 diabetes. Hepatitis C infection is a well-known risk factor for beta-cell dysfunction type 2 diabetes. A little study compared the pancreas of positive and negatives HCV donors and found that HCV positive donors' beta cells possessed the cytoplasm virus, associated with morphs on the mitochondria, and decreased glucose-stimulated insulin release. In vitro. Concerning coronaviruses, SARS-CoV-1 has been displayed to bind to the ACE2 receptor on pancreas islets are supposed to induce damage and acute diabetes. While no similar conclusions on the novel SARS-CoV-2 virus have been published, this putative pathophysiological approach could lead to openness of insulin and an increased risk of CAD, particularly for people with established type 2 diabetes. Data on SARS-COVID-2 are limited at the time of publication and this mechanism is continued. There are not adequate data to estimate the prevalence of CAD in COVID-19 and the increasing risk of SARS-CoV-2 over other major infectious diseases. To present, in 648 hospitalized patients with insured COVID-19, only a single study has reported the prevalence of acidosis and ketoacidosis. The group includes 42 (6.4%) positive urine or serum ketones, 7% of which matched CAD ADA criteria. Ketosis patients had baseline diabetes about twice, and all 3 CAD patients had the underlying diabetes (1 with T1D, 2 with T2D). to comprehend the real impact of CAD in COVID 19, larger cohorts are needed. A possible significant finding of serious disease with high inflammatory markers is among

COVID-19 patients, which are also high in regard to CAD, irrespective of the disease involved. In particular, it has been highlighted that IL-6 may play the function of the SARS-CoV-2 virus in a maladaptive immune response was identified as a potential therapeutic target. In DKA, IL-6 was also search to be raised, and mainly a ketosis factor is thought to be an outcome, but that was not clear. It remains to be seen It is yet clear whether DKA- and Severe COVID-19 inflammatory cascades are synergistic to produce poor clinical results (27).

2. Management:

2.1 Consideration in the Management of Diabetic Ketoacidosis:

Insulin shortage leads to a reduction in the use of glucose in peripheral tissues, leading to higher counter-regulatory hormonal levels, and increased generation of hepatic glucose, and excessive oxidation are from free fatty acids to ketoacidosis. The essential elements of the treatment of CAD are good-established treatment directives have been maintained by diverse professional associations, worldwide organizations and specialists. The head principles of CAD treatment in decades, the trinity of fluid revival, potassium substitution, and insulin substitution has not changed. The Patients with hyperglycemic crises who are profoundly dehydrated and fluid are crucial aspects of treatment. To expand the Isotonic saline is frequently the recommended fluid resuscitation solution for intravascular volume and restorer perfusion. The following fluid choice relies on sodium and glucose levels. Potassium enters extracellular space in the context of acidosis and insulin insufficiency. Potassium moves intracellularly with insulin therapy and fluid management and close surveillance and restoration of potassium are necessary. Due to the absence of evidence to show a mortality benefit, the use of bicarbonate therapy in DKA routine and administration

is generally reserved for life-threatening acidosis sufferers is not suggested (pH <6.9). Historically and today, the most widely used hospital setting for managing diabetic ketoacidosis care has been the ICU. This is mainly because of the often-needed glucose monitoring in IVI patients, where insulin modifications in uncomplicated patients are often needed. CAD contributes to insulin sensitivity, ketosis, acidosis and high fatty acids, hyperglycemia itself. How these resolve with each concurrent therapy (fluids and insulin), the serious of hypoglycemia is exceptionally high. It is widely established that inadequate potassium supplementation is the first impediment to the treatment of CAD and secondly, that hypoglycemia cannot be prevented. A close third of the cases of ketoacidosis in cases of incompetence in the transition from IVI therapy to subcutaneous insulin is a recurring disease. While there are various publications on the avoidance of unfavorable transitions, maybe the most advanced and experimental tests were done to prevent rebound ketoacidosis or significant hyperglycemia by the administration of long-acting subcutaneous insulin, such as glargine during early stages CAD and IVI. As indicated, CAD due to the application of the SLGT2 inhibitors has caused CAD in hospitalized patients without observed severe hyperglycemia while being relatively uncommon in practice. In a recently conducted retrospective cohort study, SGLT2i had a 1, 49-point odds ratio in non-User-CAD and 41% had peak glucose < 13, 8 mmol/L (< 250 mg/dL) versus 0, 8% non-user. Precipitating factors include acute oral intake disease, vomiting, fasting, and decreases in insulin dosages related to better glycemic control. Although a combination of elements with volume depletion and lower tissue level glucose availability is likely to be postulated as various plausible processes. They are playing important roles. European Union CAD treatment includes the same triad approach to conventional CAD but clearly differentiates from dextrose-containing liquids as an initial step instead of being introduced later as dextrose levels decline glucose. The other key treatment is that glycosuria caused

to SGLT2i can last for days and fluid regeneration may need to be extended beyond the stage of a median oral fluid intake by the patient. (28).

2.2 Management of Severe or Complicated DKA diabetes Patients with COVID-19;

A serious CAD necessitates management of IVI in the ICU, frequent blood or capillary glucose monitors in addition to other kinds of hyperglycemic crisis, frequent laboratory monitoring and when necessary, access to respiratory and cardiac surveillance. Complicated patients usually need IVI or for some more acute care regardless of the severity of the CAD. Although vital data are not currently published on COVID-19 insulin requirements, in critically ill COVID-19 patient's doctors have seen higher than normal insulin requirements (up to four units/kg/day). Moreover, the concurrent use of vasopressors or corticosteroids, as mentioned elsewhere, might considerably influence insulin needs when doses are time-adjusted. That requires an insulin administration technique that enables quick correction to large changes in readings of blood glucose. While judicious use of short-acting or quick-acting insulin in some COVID-19 individuals dosed every four or six hours, in combination with long-acting or intermediate-acting insulin, IVI should be the usual therapy for COVID. -19 individuals with critical CAD concomitant positive. Due to the differing requirements, the frequency of glucose monitoring in patients with steady insulin injection rates has been lowered to every 4-6 hours and continuous glucose monitoring devices have been taken into consideration. As

indicated above, a quick rise in insulin sensitivity in severe CAD is the result of the resolution of CAD. This calls for the insulin rate to be tested every hour while infusing dextrose-containing fluids to prevent hypoglycemia (29–31).

3. Challenges:

3.1 Challenges of women with diabetes mellitus during the COVID-19 pandemic:

The pandemic COVID-19 has produced massive global health systems. The illness appears to infect male and female equally, but trends suggest that men have a more significant prefix. Differences in immune responses, angiotensin conversion (ACE2) expression, the Comorbidity prevalence and health related features such as smoking and beverage have been attributed to this. However, it cannot that somehow women are protected. Smoking, diabetes, advanced age, high blood pressure, cardiovascular disorder, and chronic blockage disorder led to increasing prefix and disease death. Diabetes women are a vulnerable population because, given the increased burden of comorbidities and challenges, they often receive inadequate diabetes and assistance. While health care during the epidemic is challenged, cardio metabolic can't be jeopardized, and new pathways such as telemedicine or mobile health must be explored. Diabetes-pregnant women should continue to receive high-quality attention for the best results, as well as for psychological women. The management of hyperglycemia situation of COVID-19 infection is critical for reducing prefix and fatality. Gender effects of bio-medical and psychological outbreaks and restriction reach well beyond, and the socio-economic consequences for women with

diabetes will likely influence long-term care. It is urgent to develop Effective policies and actions in this vulnerable category to support optimum treatment (32,33).

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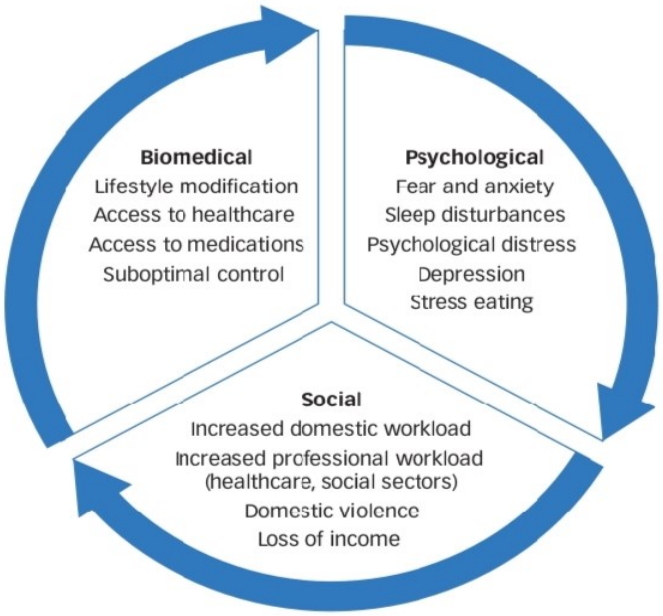

Figure 1: Challenges in women with diabetes time of the COVID-19 pandemic

3.2 Diabetes and COVID in women:

Patients with split COVID-19 infection have a high appearance of pre-existing comorbidities. According to data from a Wuhan hospital, 64.3 percent At least one comorbidity was in suffers, with diabetes accounting for 12.1 percent of the total. In 10 trials with 76,993 participants, hypertension was 16.37%, cardiovascular disease was 12.11 percent, and diabetes was 7.87 percent. Diabetes people suffer from innate and adaptive immune deficiencies which enhance their risk of infection. In people with diabetes, viral clearance is also decreased. Inflammatory responses to viral infections are also more

critical, and the cytokine storm is more likely. For those with type1 or type2 diabetes with several medicines including ACE, Ibuprofen and Thiazolidinedione, the ex-pressure of ACE2 is enhanced. ACE2 polymorphisms have been associated with diabetes and high blood pressure and can establish a hereditary predisposition for a serious illness. Asian subjects. In addition, other comorbidities, including obesity, hypertension, and cardiovascular disease, are often Diabetes related. In earlier epidemics of respiratory infections like SARS and MERS, diabetes was associated with greater and greater risk of injury or death. Within China, 1.590 COVID-19 patients were analyzed nationwide to include chronic obstructive pulmonary diseases, diabetes, high blood pressure, and disease in their compound outcome, the requirement of mechanical ventilation, and death. 17.1 percent had hypertension, 16.4 percent had heart disease, and 9.7 percent had diabetes in a six-study meta-analysis. In those with severe disease (acceptation of ICU), Hypertension and diabetes rates were twice as high, and in those with non-severe disease, it is triple higher. The assessment of 174 consecutive COVID-19 patients, 21.2 percent had diabetes, further demonstrated an increased risk. Increased risk of pneumonia in people with diabetes compared with people without diabetes; high tissue damage markers, Higher inflammatory indicators including erythrocyte sedimentation rate, C-reactive protein, interleukins 6 and ferritin and enhanced hypercoagulability, e.g., lactate dehydrogenases, alanine aminotransferases and gamma-glutamic translates. Diabetes patients were older, and their mortality was higher. Similar risk of COVID-19 among people with diabetes has been shown by several research in the USA and Italy. In conclusion, diabetes was recognized as an essential Risk factor and consequences for infections, including acute lung and heart harm and admission needs for hospitals and ICUs as well as mortality. Comorbid situation, such as cardiovascular disqualify and chronic kidney diseases, often occur alongside diabetes, further exacerbating this risk. However, it is common knowledge that women

with diabetes are more likely to be at increased risk for concurrent comorbidities., but the data available so far do not address sexual difficulties in people with diabetes. 7 Women who have diabetes are therefore an essential vulnerable group and need special attention.

4. Management:

4.1 Management of diabetes in women time of the pandemic:

There are different challenges to look after women with diabetes, even outside of the pandemic period. There is a lack of Healthy food, training time and space and access to medicines and medical services, to name a few. In low and middle-income countries, such resources are generally fought, with women bearing their limitations to a higher degree. In a time of global health crises like the current COVID-19 pandemic, this scarcity can be magnified. The Pandemics themselves and efforts to contain women with diabetes present considerable difficulties in the administration of all areas of diabetes care.

4.1.1 Healthy food and nutrition:

A number of causes why women can't eat well foods, such as not preparing separate foods, unhealthy foods, not supporting the partnership, having time to treat the elderly or the children within their families, or having sufficient time to make their own healthy decisions. When there is a large family at home, the challenges are raised; it is challenging to manage healthy diets. A practical solution would be a healthy diet plan for the whole family—this question. Family support impacts a healthy diet positively. It Improves perceived support, self-efficacy, psychological wellbeing and control of glycemia.

4.1.2 Exercise and physical activity:

Body activity contributes to glycemic and weight control and Managing stress. Besides the family work routine, which was demonstrated to be of Intensity from low to moderate, there are significant salutary effects at least 30 min a day of medium regular exercise with high intensity. However, it is not easy to socialize with the current situation, and group workouts are impossible. In this situation, the majority of the family members are currently at home, therefore group family activities, including workouts, could be useful.

4.1.3 Sleep

The significance of sleep hygiene has been emphasized in cardio metabolic health and the growing immunity power. The pandemic and the lockdown have brought about important daily lifestyle changes. It is essential to emphasize the need for the proper time to sleep and avoid disrupting day-night schedules.

4.1.4 Access to medications

Public fear of the continuous supply of insulin and medicines was expressed throughout the world. Diabetes persons should be informed at least 1-2 months before the previous stock ends to save appropriate medicinal supplies. Patients should be reminded to discuss about changes with their care providers when supply issues emerge. In the event that there are budgetary limits, cheap alternatives must be considered for oral and injection medication.

4.1.5 Prevention of COVID-19 and precautions in women with diabetes: (34)

General precautions	• Frequently hand washing for 20 seconds and sanitizing hands with a 70% alcohol-based rub. • Avoid touching the face and eyes. • Avoid gathering, public transport, or crowded spaces. • Maintain a distance of 2 meters from others. • Cover the nose and mouth with clean tissue when coughing and sneezing. • Fully clean groceries/vegetables before use.
Optimized diabetes care	• Balanced hydration and nutrition. • Regularly scheduled physical activity. • Adequate sleep • Stress-reduction trick. • Consultation with a healthcare provider – consider telemedicine and in-person visit, if deemed necessary. • Maintain reasonable glycemic control as per individualized targets. • Assessment and optimization of cardiovascular and renal risk. • Vaccination against pneumonia, pneumococcal, and influenza.

Precautions when visiting healthcare facility	•Restrict few numbers of patients at any time to avoid overcrowding. • Screen patients at the entry for flu-like symptoms and seclude them to a separate "flu corner." •To provide patients with masks, gloves, eye protection at entry. • Prominently show general hygiene and social distancing instruction. •After sanitize when using instruments such as sphygmomanometer, stethoscope.

4.1.6 Management of diabetes patients with COVID-19 infection: (34–36)

	Mild to moderate	Critically ill
Clinical picture	• Mild flu-like symptoms • Fever • Normal sensorium • Asymptomatic	• Septic shock • Pneumonia • Acute cardiac injury • Acute lung injury

Monitoring	• Ketones check when blood glucose persistently high • Target blood glucose: pre-meal <140 mg/dL, random <180 mg/dL • Periodical assessment of clinical status	• Monitoring blood glucose 1-2 hourly • Target blood glucose level 140-180mg/dl • Serum and urine ketones
Anti-diabetic medication	• Continue pre-existing stable antidiabetic medication. • Sulfonylurea's dose may need to be reduced if oral intake is reduced • DPP4 inhibitors can be continued if they are well tolerating and not contraindicated if there is renal impairment	• All oral antidiabetic agents stop as well as GLP-1Ras (37)
Insulin	• Insulin dose titration of ongoing insulin therapy as per blood glucose record and correction bolus if require • Basal bolus insulin regimen	•Switch to basal-bolus insulin regimen after clinical improvement and once adequate oral intake begins •Discharge on insulin with instruction for self-titration of doses and home monitoring • Intravenous insulin infusion

5. Challenge:

5.1 Challenges in Diabetes Neuropathic with patients during the COVID-19 pandemic:

Diabetes neuropathy is one of the diseases for diabetes-affected patients. First of all, diabetic neuropathy must be known. Diabetic neuropathy is a kind that a person with diabetes can cause. Excess blood glucose can harm nerves richly patient's body. Diabetic neuropathy most at every turn damage nerves in patient's legs and feet (38). Building Diabetic neuropathy can range from agony and addictive pain in your legs and feet to difficulties with your digestive system, urinary tract, blood vessels, and heart on your invaded nerves. Few people are slightly symptomatic. Diabetic neuropathy, however, can be totally damaging and unsuited for others. Diabetic neuropathy is a major concern for diabetes, affecting up to 50% of diabetes patients, and 19 lock-downs in Covid. However, patients can often restrain diabetic neuropathy or calm its advance with consistent blood sugar/glucose management and a healthy lifestyle. According to our survey or research, many patients with diabetes suffered from this disease in Covid 19. They live with the symptoms of diabetic neuropathy. This problem has occurred for lockdown. People who did not exercise regularly and uncontrolled food habits and idleness affect diabetes patients. We were to survey 100 diabetes patients; the patients lived in many different places in Bangladesh. During that lockdown or after lockdown, 60% of patients suffered from the symptoms of this diabetic neuropathy. The symptoms of this disease are given below;

Usually, the symptoms of this disease are derived into four different types;

(1) Peripheral neuropathy

(2) Autonomic neuropathy

(3) Proximal neuropathy

(4) Mononeuropathy.

5.1.1 Peripheral neuropathy

This type of neuropathy may also be mentioned as distal symmetric peripheral neuropathy. It is the much-known type of diabetic neuropathy. It attacks the feet and legs, first of all imitated by the hands and arms. They are;

- Numbness or reduced ability to feel pain or changes in temperature.
- Tingling or burning sensation.
- Sharp pains or cramps.
- Increased sensitivity to touch: for some people, even the weight of a sheet can be painful.
- Significant foot problems, such as ulcers, infections, and bone and joint pain.

5.1.2 Autonomic neuropathy

A self-contained neural system controls our heart, bladder, stomach, bowels, sex organs and eyeballs. In one of these places, diabetes can affect nerves (39).

- A deficiency in the knowledge that blood glucose levels are low
- Matter of Bladder or bowel
- Not fast emptying of the stomach (gastroparesis), reason nausea, vomiting, and loss of appetite.
- Changes in the road patient's eyes synthesize from light to dark
- loss sexual response

5.1.3 Proximal neuropathy (diabetic polyradiculopathy)

This type of neuropathy, also known as diabetic amyotrophy, often attacks the nerves in the thighs, hips, buttocks, or legs. It can also attack the abdominal and chest area. Symptoms commonly take place on one side of the body but can spread to the other side.

- Acute anguish in the hip and thigh or buttock.
- Eventually, weak and shrunken thigh muscles
- Hardly to getting up from a sitting position
- Split stomach pain

5.1.4 Mononeuropathy (focal neuropathy)

Cranial and peripheral mononeuropathy are of two sorts. Nerve injury is known as mononeuropathy.

- Focus or double-vision difficulty
- Aching from one eye
- Paralysis from one side of the face
- Dumbness or tingling in the hands of or fingers of patients except for rosé (little finger)
- Weakness in the hand of patients, which may lead to things falling there

5.2 Doctor counseling;

- Cutting or sore on an infected or unhealing foot
- Burning, tingling, weakness or feet discomfort interferes with day-to-day work or sleep.
- Digestive, urinary or sexual changes.
- Disappointment and decay.

5.3 Causes

Every type of neuropathy is produced by detection. Researchers worry about uncontrolled blood sugar excess damaging neurons over time and affecting their ability to relay signals to diabetic neuropathy. There is also a lack of excess sugar in the walls of small venous (capillaries) that emit nerves with oxygen and nutrients.

5.4 Risk factors

All with diabetes are susceptible to neuropathy. However, these risk factors enhance the probability of patients suffering nerve damage:

- Poor blood sugar management; uncontrolled blood sugar puts patients at risk for all diabetes complications, including nerve damage.
- Diabetes history; diabetes risk of diabetes grows with more diabetes, especially if sugar in individuals is not maintained effectively.
- Kidney damage can result from diabetes. Blood toxins that may contribute to nerve injury are delivered through renal dysfunction.
- Being overweight; up to 25 people can get BMI diabetic neuropathy.
- Smoking; smoking lowers the blood flow to the patient's legs and feet and stiffens his artery. The wound cure and peripheral nerves are therefore exceedingly complex. (40).

During Covid 19, More serious symptoms and consequences in diabetes people are connected with respiratory infections. We assume that the risk of disease severity could be significantly affected by diabetic neuropathy. The loss of immune reaction control and lung function, particularly gas exchange, may be caused by diabetes neuropathy and

autonomous dysfunction. Preliminary evidence shows how a reaction to the immune system produces pulmonary injury during COVID-19. A pathophysiologic mechanism shared with other serious acute respiratory infections such as SARs or MERS is the present therapeutic objective of increased cytokine production. T lymphopenia is typically found with loss of inappropriate immune reaction in patients with COVID-19, induced by consumption and decreases in regulatory T cells of CD4+ and CD8+ lymphocytes. A greater serum level is usually seen in severe COVID 19 types for proinflammatory cytokines (TNF alpha, IL-6) and chemokines (Il-8). These data are important for the inflammatory reaction to serious complications of the disease.

A process termed the inflammatory reflection regulates the nerve system's inherent and adaptive immunity. The autonomous nervous system is supported by the sensory contribution of inflammatory cells to a negative feedback process to modify the immune response. The afferent sensory arc may be activated by humoral or neuronal impulses. Through the circumventricular organ marked by blood-brain barrier discontinuities, TNF-Alpha and the other inflammatory mediators can enter the central nervous system. Furthermore, the sensitive innervation of the immune bodies might transmit afferent signals to the reflection by rising ambiguous fibers. The effective motor arc of the reflex releases acetylcholine into the reticuloendothelial system, resulting in lower synthesis in macrophages of proinflammatory cytokines. The loss of ability to regulate the immune response may be affected more critically by diabetic neuropathy. Some physiological mechanisms may be affected by the resulting over-expressed response to inflammatory stimuli. We hypothesize that autonomy of the nervous system can influence the pro-inflammatory condition of COVID-19 diabetic patients due to inflammatory reflex theorization dysregulation (41,42). With regard to the lung function, the autonomous nervous system dysfunction is significantly associated with the DLCO decline in diabetes

of type 1. The thickening of the pulmonary basal laminae and alveolar epithelium, which correlates with the severity of microvascular problems, are one of the most often characterized histological pulmonary disorders. Enhanced and faster collagen protein production inter-connection caused through oxidative stress induced by reactive oxygen species and glycation in the extracellular matrix of non-enzymatic proteins appears to cause damage to the lungs' microcirculation by increasing thickening from the vessel wall. However, even after adjusting Metabolic and clinical factors such as microvascular complications, we found that DLCO has been correlated with HRV (cardiac variable). One possible explanation is that diabetic autonomous neuropathy could lead to functional alterations in pulmonary Broncho motor tone regulation and ventilation control. In another study, we noted changes in Broncho motor tone in patients with diabetics with quicker I123 MIBG clearance due to intravenous noradrenergic dysfunction during ventilator Scintigraph.

6. Management:

6.1 Management of Diabetic Neuropathy with diabetes during the COVID-19 pandemic;

Patients can manage their Diabetes neuropathic challenges, which occurred during Covid 19 lockdowns by those managements.

6.1.2 Blood sugar management

It is suggested to be tested at least twice a year by the American Diabetes Association. This test calculates the over the previous two to three months averaging blood sugar levels in patients. A1C objectives may be required, however for most adults ADA advises an A1C that is less than 7%. If blood sugar levels for patients are greater than they are intended,

their daily care may require changes, such as the addition or adjustment of their medications or diet changes.

6.1.3 Foot care

Foot problems, including healing sores, ulceration and perhaps amputation, are frequent diabetic neuropathy consequences. However, patients can prevent many of these problems by having their feet evaluated at all clinic visits and taking good care of them at home at least once a year.

Doctor's advice on healthy foot care, to protect these problems following this instruction:

- Patient feet can be checked every day. Seek blisters, cuts, blisters, skin cracks, peeling, redness and swelling. Swelling. Use a mirror or ask a friend or relative to help them look at their feet's troublesome parts
- Keep your feet clean and dry your feet. Wash your feet with mild soap and warm water every day. Do not wet your feet. Dry your feet and stick carefully with your toes.
- Moisturize the patient's feet. This helps to get cracking. However, do not put lotion among your toes, as fungal growth could be stimulated.
- Careful cutting of the patient's toenail. Rightly cut off your toenails. Carefully draw the rims to avoid sharp rims.
- Wearing socks that are clean and dry. Look for cotton or winding fibers socks with thick seams or no tight ribbons.
- Wear padded Fit good, shoes. Wear patient's foot shoes or slippers always. Check that the shoes fit comfortably and let the toes move. A pediatrician can tell you how

to buy fitting shoes and how to address heel and callus problems. Your plan can cover a minimum of one pair of shoes every year if you qualify for medical care.

6.1.4 Exercise:

Exercise is essential to work for a diabetes patient. During Covid 19, diabetes who's faced diabetic neuropathy disorder, maximum of them do physical exercise for the better prevention. Workout is the best way to manage this type of problem. In our country, many people of diabetes patients face this disorder during Covid 19. When they are counseling with the physicians, the maximum of doctors mentions them for doing these types of exercise.

6.1.4.1 Low-impact cardiovascular exercise

The capacity of cardio in people with type 2 diabetes to enhance vascular health has been A study published in January 2017 in the International Journal of Neuroscience has shown that aerobic exercise could help improve the health of blood vessels in persons with aerobics. Neuropathy linked to diabetes. According to the American Diabetes Association (ADA), aerobically exercise can also help lower blood sugar and cholesterol, which helps enhance your flow and nerve health. Skip the paving for gentler, more impactful activities such as swimming and cycling to enhance the flow of blood and reduce cutbacks, scrapes and blisters, Recalls Machowsky (43). If you're not the most balanced on a bike, hold an indoor bike. Whatever training the ADA prescribes, strive to have an aerobic activity of at least 30 minutes five times a week.

6.1.4.2 Strength Training (Seated)

Muscles, insulin, and vascular health of diabetes patients are closely connected, and the muscles act as a type of sugar-burning furnace, which helps the blood vessels to To and from the heart, pump your blood. While weight-lasting activities that let them get the most out of all the reps are fantastic, if they're not that stable on their feet, it's probably not a great idea to work out with a bear on the back! Don't worry about that. It's astonishing how they can complete numerous powerful exercises from the seated posture. Check out the leg reinforcing devices in your gym, including leg extension, curling and glute kickback equipment. You can conduct a wide range of high body workouts as you sit on a bench while you are in the process, starting with curls and presses on the shoulder. ADA recommends strength exercise at least twice a week, in addition to cardio routines.

6.1.4.3 Balance and Stability Work

Diabetes-related neuropathy improve significantly the serious of falling, according to a report in the International Journal of Nursing Sciences published in December 2014. He observes that the likelihood of a decrease was 23 times higher in a previous study by older adults with diabetes-related neuropathies. Balance and stability come here: the muscles and neurons responsible for them are trained to Machowsky says that fire and work correctly together. Your legs, foot and trunk are your essential muscles to keep you standing. Try to include some balance work or stability in each training. Do one-leg exercises (wall holding or a robust object to balance); walk straight from heel to toe; and perform basic workouts, such as boards, dead insects, birds, and wires.

6.1.4.4 Mind-Body Exercise

The nervous system needs yoga, tai-chi and active meditation exercise. According to a review released in October 2012 in the Annals of the Indian Academy of Neurology, study reports have frequently proven yoga as useful for the management of numerous neurological illnesses, including diabetes-related neuropathy. Researchers note that yoga is beneficial in reducing stress, blood pressure and inflammation, which can all influence neuropathic progression. Moreover, while yoga may seem less intense than cycling or strength training, it still makes their heartbeat and can build muscle. Perform patient's mind-body method of choice in a way that meets their needs and augments their other workouts. For example, patients might consider a gentle flow yoga class as a way to recover after more intense cardio or strength training. Meanwhile, the more advanced yoga classes can work as a fantastic training in cardio and strength.

Generally, the workout is the best way to counter this disease. In general, this type of exercise is most used by diabetes patients during Covid 19 lockdowns (44).

6.1.5 Medication

People with D.M. must miss medical consultations and clinical visits, among other things, to alter antidiabetic drugs due to imposed blocks. This can lead to long periods of ignored hyperglycemia and hypoglycemia. This is the time for persons with diabetes to adopt telemedicine for maximum health. Healthcare workers should increase health education on diabetic drug interactions. Much information about home remedies and likely remedies for COVID-19 is in circulation. One example of this is the current social media buzz surrounding hydroxychloroquine. In order to avoid inadequate use of the medicine as an antidiabetic in COVID 19 Pandemic, patients should be advised about hydroxychloroquine contraindications (diabetic radiotherapy or a history of seizures). D.M. educators can provide patients with internet stores for access of antidiabetic medication. Though

teleconsultations could ensure adherence to medications, only relatively few people can afford medical attention from private institutions. Government agencies now are crippled by strikes, lack of resources and staff shortages because, after contacts with persons of COVID-19, more and more people are becoming isolated at home. Some health insurers have launched the Medic-Express TM service, which makes prescription refill applications online and then delivers medication to home. Very few people can afford the service, however. Two weeks before the end of the medication, patients should also start the recompositing procedure to ensure continuity of treatment (45).

Generally, diabetic neuropathy problem solved by medication, such as (46,47) :

- Neuropen 300mg (Generic Name- Gabapentin)
- Neugalin 25mg (Generic Name- Pregabalin)
- Neobion (Generic Name- Vitamin B1, B6 & B12)
- Joinix TS (Generic Name- Glucosamine Sulfate + Chondroitin)

Usually, Joinix TS is used for the trigger problem of fingers for neuropathic diseases.
These types of medicines are generally used for the nerve problem of diabetic neuropathic. Maximum patients suffer from Peripheral neuropathy types of neuropathies. According to a survey on diabetes patients in Bangladesh, who is are suffering from diabetic neuropathic disease during Covid 19, collected their physicians' prescription all medication is maybe same.

After taking this medicine top portion of patients improve day by day from their numbness and body burning; this problem can burn the patient's inner body. On the other hand, we noticed that the maximum patient suffers from lack of blood according to this nerve problem. The physicians are warning these types of patients to avoid sunlight heat without morning heat.

7. Challenge:

7.1 Challenges in hyperglycemia with diabetic during COVID-19:

The risk factor for severe diseases and death from COVID-19 has become central in the area of diabetes. A novel coronavirus, severe acute coronavirus 2 syndromes (SARS-CoV-2) (COVID-19) was initially reported in Wuhan, China, in late December 2019 and has grown to over 3 million pandemics. The cases have been confirmed and continue to increase. There have been no specific therapeutic agents, and their infectious nature, hospitalization rates, intensive treatment, and mortality are very high in the presence of COVID-19 infections and respiratory dysfunction induced by viruses, existing chronic diseases such as diabetes, hypertension, and obesity lead to worse outcomes. Hyperglycemia is reported to increase the concentration of plasma glucose in respiratory tract secretions in influenza-like diseases. Furthermore, there is a description of the increase in virus replication in vivo and antiviral immune reaction suppression. Increasing vasculature permeability and ensuing alveolar epithelial collapse can directly influence lung function and explain the higher mortality rate observed in these patients (48,49). The glycemic control may be affected by SARS-CoV2. An acute illness or inflammation is widely recognized to enhance insulin resistance, therefore increasing blood glucose levels. Of note, about 40 percent had uncontrolled DM or hyperglycemia in 88 United States hospitals in 1122 COVID-19 hospitalized patients. The previous teachings of coronavirus indicate that glucose metabolism from temporary J. Clin. Medicine can be directly affected. 2020, 9, 2288 4 In 2003, even in individuals with moderate illness, hyperglycemia was prevalent in SARS-CoV2 infections. It was eventually established that SARS-CoV2 can directly injure the pancreas and decrease insulin secretion in the endocrine part of the pancreas, leading to the insulin-dependent transient D.M. (ACE2). A similar concept can

be hypothesized for SARS-CoV2 with the same membrane-receptor for host cells that enter SARS-CoV2 cells, i.e., ACE2. Interestingly enough, ACE2 expression is slightly superior to that of the lung in pancreas, suggesting that SARS-CoV2 may also bind pancreas ACE2 and produce pancreatic subclinical damage. In a previous study, increased ACE2 activity was discovered in the diabetic mice's pancreas. Further investigations are required to check whether endocrine pancreatic clinically meaningful harm can be found in serious COVID-19 patients. Viruses can activate the immune system and enhance cytokine synthesis and release in genetically prejudicial individuals with autoimmune disorders. Interestingly, such pathways could be triggered by SARS-CoV2. Further investigations should be carried out to determine whether SARS-CoV2 might activate autoimmune pathophysiology of β-cell destruction in predisposed individuals to lead to long-term autoimmune D.M. States States (Figure 3.1). In addition, 194 diabetes patients were selected (17.3 percent of the overall population). In addition, 257 more hyperglycemic individuals (defined as the presence of two or more B.G. > 180mg/dL within any 24h A1C < 6.5% or no A1C test during hospitalization) have been discovered.

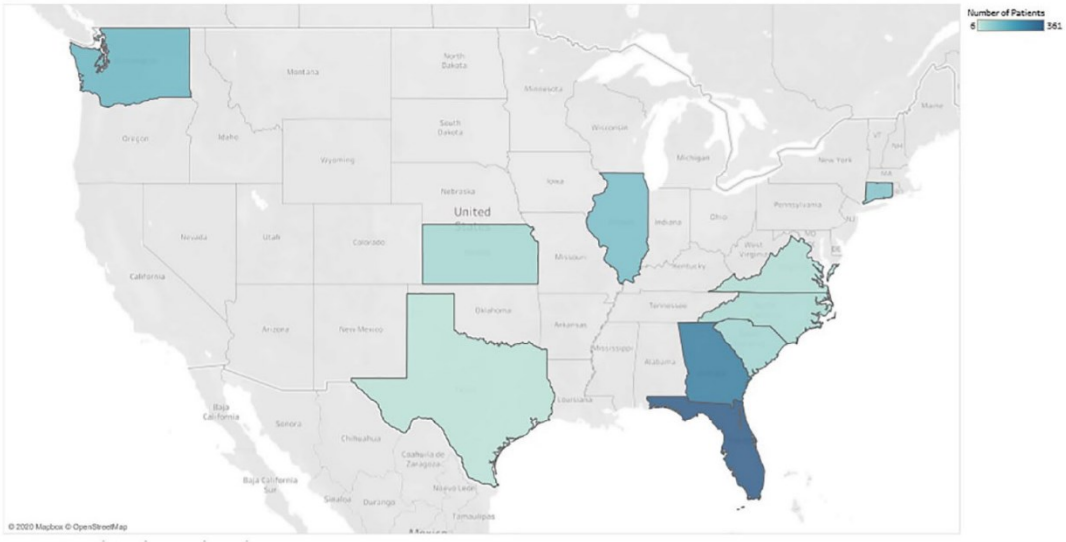

Figure 2: U.S. States with COVID-19 study patient, March 1 to April 6, 2020 (50)

7.1.1 Glycemic targets:

In the past two decades, glycemic control targets at the ICU have been discussed. Sharp glycemic control (80–110mg/dL (4.4–6.1mmol/L)] is generally accepted as not being beneficial in comparison to reasonable control (140–180 mg/dL) (7.8–10.0mmol/L). It may raise the risk of hypoglycemia and even death. It is also agreed that the risk of hospital complications may increase with sugar levels above 180 mg/dL (10.0 mmol/L). However, less well-established limit values for glycaemia are used, and hypoglycemia risks are generally recommended with values more than 110 mg/dL (6.1 mmol/L).In the GLUCO-CABG study compared to the glucose target of 100–140 mg/dL (5.6–7.8 mmol/L) to 141–180 mg/dL (7.8–10.0 mmol/L), the results of the Krinsley et al. trial in critically ill patients supported an 80–140 mg/dL (4.4–7.8 mmoll/L) B.G. target of patients with witnesses shown a considerable reduction in the complex consequences of patients with graft surgery coronary artery bypass.

It should also be noted that glycemic fluctuation is linked to higher sepsis mortality rates than hyperglycemia. Glycemic variability is therefore advised that it should be part of hyperglycemic therapy, including in ICU patients. This data shows a possible benefit of a customized glycemic target in critically sick patients such as the management of ambulatory diabetes. Clinical directives advise that blood glucose levels should be maintained between 140 and 180 mg/dL (7.8-10.0 mmol/L) for most critically ill patients. Without any major hypsography, it is possible to attain a stricter 110–140 mg/dl (6.1–7,8 mmol/L) in chosen individuals. We believe that the suggestions could be extended to critical patients with COVID-19, in agreement with Pasqual et al.

7.1.2 Insulin Therapy:

For critically ill COVID-19 patients, the therapy of choice should be insulin. The primary secure and efficient insulin protocol targets should be to reduce contact frequency, reduce glucose fluctuation, minimize the risk of serious hypoglycemia, and enhance overall glycemic control. Due to the stresses reason by SARS-CoV-2 infections and differ factors, for example, in artificial ventilation continuous tube feeding and risk for tube hypoglycemia, or the use of rich corticosteroids, patients may be subject to large glycaemia. In addition, patients with high levels of glycaemia may suffer. The most effective way of achieving glycemic goals is continuous intravenous insulin infusion, based on validated written or computational protocols. Protocols without insulin dosage calculation are preferable to those requiring dose decision calculations. Effective use of the protocol and predefinition of adjustments before significant changes in B.G. and situations in which corticosteroids, vasopressors, parenteral nutrition, etc., are removed or added is important for protocol safety. Training of doctors is essential for protocol safety. However, the frequency of glycemic monitoring is the primary factor that contributes to the safety of the security. Most protocols require minimum hourly glucose monitoring for successful glycemic goals while decreasing the serious of hypoglycemia. In order to control glucose levels, caregivers must enter a patient's room with a meter and test strips. For hemodynamically stable patients who don't require parenteral nourishment or high-dosage corticosteroids, we advocate adopting SBC or basally-corrected insulin systems to limit the chance of exposure to health workers during hyperglycemia therapy in critically diseased COVID-19 patients. If the patient is clinically stable, it is advised that the patient move from IV to subcutaneous insulin. The initial insulin dose can be established in 60%-80% of insulin given intravenously during the last 24 hours during the transition. A sufficient period of overlap with insulin infusion and subcutaneous insulin administration is needed

to avoid rebound hyperglycemia after the transition. Short-acting insulin and long-acting insulin may be administered 1 to 2 hours before the stoppage of intravenous insulin.

8. Management of hyperglycemia for noncritical patients with COVID-19:

8.1 Glycemic targets:

As a B.J. target for most non-critically ill patients, the American Diabetes Union proposes a range of 140–180 mg/dL (7, 8–10, 0 mmol/L). However, the ideal glucose goals remain undefined and current recommendations are mainly based on retrospective research, clinical experience, and judgment for non-critically ill patients. There is a lack of evidence on suitable glycemic objectives for COVID-19 hospitalized patients. As previously mentioned, better clinical outcomes have been associated with B.G. levels between 70 to 180 mg/dL (3.9 and 10.0 mmol/L). In patients who have a rich serious of hypoglycemia or a limited lifespan, sugar levels below 180 mg/dL (10.0 mmol/ L) may be acceptable in the case of premeal and quacking B.G. values below 140 mg/dL (7.8 mmol/L) with random maximum B.G. values lower than 180 mg/dL (10.0 mmol/L) and with an earlier tight glycemic control.

8.2 Insulin Therapy:

Limited data on the efficacy and safety in hospitalized patients of non-insulin agents are available almost exclusively with di-peptidyl-peptidase-4 (DPP4) inhibitors. In COVID-19 individuals and mild to moderately high blood glucose, these agents combined with basal insulin are an alternative. The protective impact on COVID-19 was also recommended for DPP4 inhibitors. Nevertheless, recent studies have shown no link

between DPP4 inhibitors and COVID-19 forecasting before admission. Incidentally, there is still no data on their use in hospitals and, in many hospitals, COVID-19 patients. Adding non-insulin drugs enhances the therapeutic possibilities and therefore the complexity of the prescription, which can be especially difficult if practitioners are unfamiliar with the management of hyperglycemia. GLP-1 receptor agonists can be appealing yet they also raise your risk of GI. Attractiveness may be the GLP-1 receptor agonists. The inhibitors of metformin and sodium-glucose (SGTL2) co-carrying should be terminated when admitted, due to the risk of lactic acidosis and DKA. SGLT2 inhibitors were hypothesized to be effective in patients with SARS-CoV-2 hypoxemia with interstitial lung edema infections in certain authors. Three patients without diabetes were reported on experiences with which SGLT2 inhibitors are not being used to demonstrate any beneficial impacts. All other oral agents should also be discontinued upon admissions, such as sulfonylureas or thiazolidinedione's. Insulin is the most effective pharmacologic treatment in hospitals for successful control of glycaemia. Several regimes have demonstrated efficiency in glycemic control and maintaining it. Current clinical guidelines are recommended as standard treatments for hospitalized, noncritical care patients with hyperglycemia and diabetes. No data are available concerning the best scheme for COVID-19 patients, but the significant of reasonable glycemic control is apparent. Much evidence supports the use by non-critically ill patients of basal-bolus regimes. Clinical randomized trials have demonstrated that the treatment of basal-bolus improves glucose control and minimizes hospital complications as compared to reactive or sliding insulin regimes. In the medical and surgical patients, comparative controls of glycemia have been demonstrated in a basal-bolus scheme, but considerably fewer hypoglycemia episodes. The glycemic control improved similarly, with no hypoglycemia differences being observed, with the addition of a basic regimen in medical and surgical patients treated with diet, oral antidiabetic

agents, or low-dose insulin. Regimes with insulin analogs and human insulin lead to a similar glycemic control in the hospital environment for the types of insulin. However, NPH basal-bolus regimen based on insulin was largely replaced by insulin analog due to a significant decrease in the risk of hypoglycemia, and NPH insulin usually is not administered once a day. The try of new basal insulin analogs of hospital environments is limited. In a recent study, a similar glycemic control was carried out using glaring U300, but a substantial reduction in the rates of clinically significant hypoglycemia in general medico-operative patients and surgical patients with type2 diabetes. [B.G. under 54 mg/dL (3 mmol/L)]. According to this research, COBALTA confirmation confirmation that insulin glargine U300 has been poorly controlled by basal insulin and/or non-insulin antidiabetic medications during hospitalization for those who suffer from type 2 diabetes. This study also reveals that intensifying therapy in the discharge of the glargine U300 is a successful strategy to increase HbA1c by 1.6% in three months and six months after discharge. These findings would provide preferential therapy for non-critical COVID-19 hospitalized patients that have a decent intake of nutrition and basal insulin or that provide basic additional correction in patients who have oral intakes or cannot assure oral intake. The long-term use of sliding insulin regimes is strongly discouraged as the sole treatment of hyper-glycaemia (51,52).

9. Management

9.1 Challenge in obesity with diabetes mellitus patient the time of COVID-19 pandemic:

Although there are insufficient data as to whether diabetes and/or obesity infections are more likely to occur in the general population than COVID-19, clinical investigators suggest a strong link between diabetes and obesity and an incremental risk, namely COVID-19 complications and severe symptoms. Uncontrolled blood sugar patients with diabetic concentrations are more susceptible to serious symptoms, causing prolonged hospitalization and an increased risk of death. Additionally, the risks of developing critical illness caused by COVID-19 in patients with diabetes or obesity increase proportionally to the presence of other pre-existing medical conditions, such as hypertension, cardiovascular disease, and chronic kidney disease. According to lockdown during COVID-19, diabetes patients suffered in obesity. The lack of free hand exercise they do not managed their weight controlled. That's why they suffered with many diabetes related disorder. Generally maximum patients suffered in hyperglycemia, diabetes neuropathy, higher glucose in blood etc. These disorder mainly the actual causes of obesity or weight gain. Obesity is also linked to other basic illnesses such as diabetes and cardiac disease that also increase the risk of serious symptoms or complications from COVID-19. Obese people with a BMI have reduced lung volume and limited expansion of the lung, increasing the risk of respiratory complications if they have a lung infection. Clinical studies have further found that severe obesity is a major risk factor for extended hospitalization and intensive treatment. Also, if obese patients with COVID-19 infection have critical conditions that require intubation, it will be more difficult to manage than non-obese patients.

10. Management

10.1 Management of obesity in diabetic patients during COVID-19:

For instance, frequent washing with water or hand sanitizers, avoiding touching of the eyes, nose & face, wearing face mask, and social distance is twice as important for people living with diabetes or obesity. Preventative actions widely adopted by the general public Additional advice in addition to these recommendations includes:

- Control of blood sugar levels: Since uncontrolled diabetes patients appear to be at greater risk of becoming infected with more severe COVID-19, healthy blood sugar levels should therefore be maintained within the normal ranges. Regular surveillance suggested by specialists can help avoid high or low blood sugar complications.
- Physical and psychological health: there are many ways of keeping the mind and body active during the pandemic. It is recommended to practice regularly to remain healthy, sleep well enough, eat healthy diets, and reduce stress or properly manage anxiety.
- Drinking sufficient water: Dehydration may occur, causing increased blood sugar levels, particularly during the summer. Therefore, adequate water supply is essential.
- Access to a carbohydrate and sugar source: sufficient supplies at home, particularly starch and sugar must be provided so that blood sugar drops can be corrected easily.
- Adequate supply of medicines: A good supply of diabetes medication or other conditions must be guaranteed, in particular if self-quarantine is indicated for a few weeks.

- Contact details in hand: All relevant contact information such as the phone numbers and phone numbers of hospitals should be prepared whenever necessary.
- If flu-like symptoms develop, medical attention needs to be sought: If any respiratory symptoms, such as fever, difficulty breathing, cough, nose or sore throat occur, then medical assistance needs to be sought immediately.

The restriction in food supply during closure could force public with D.M. for modify their eating rules previously associated with good glycemic control. It is important to pay attention to nutrition and adequate protein intake. In general, in resource-limited environments, especially Zimbabwe, there are substantial intake of carbohydrate-rich meals. Approximately 50-60 percent of their entire amount of calorie should be used for the day-to-day consumption of the patient. Pure water should be preferable to very expensive fruit juice, drinks and sugar syrup. At all times, patients need to be well hydrated. Fats should not exceed 30% of total daily calorie requirements and ideally, 3 tablespoons of polyunsaturated oil should be used for cooking each day (e.g., peanut, cotton and olive oils). The consumption of protein should be 1 g/kg/day, however in persons with kidney difficulties it should be lower (0.8 g/kg/day) (diabetic nephropathy and macroalbuminuria). Telehealth dietary measures aimed at dietary patterns have enhanced dietary quality and intakes of fruit and vegetables and dietary salt. Therefore, it is suggested to remain in constant contact with patients with access to nutritionists. General statements from true institutions like the Zimbabwe Ministry of Health and Child Care, the World Health Organization (WHO), and the Centers for Disease Control are also advised to be used (CDC) (53,54).

11. Challenge

11.1 Challenges in physical exercise with diabetes mellitus patient during COVID-19 pandemic:

The ongoing infected respiratory disease Coronavirus has been a world leader in health, causing public concern. It could lead to serious pneumonia until death. The WHO declared a new outbreak of coronavirus to be a public health emergency on 30 January 2020.WHO has warned that older populations and the public with pre-existing situations such as diabetes, heart condition, high blood pressure, pulmonary disorder, cancer are the most vulnerable populations. Specifically, those with type 1 (PWT1D) and poor blood sugar control (HbA1c) in particular have demonstrated increased risk of countering infections from an impaired immune system, as is also true with Covid-19. Highly resistant blood sugar (HbA1c) has also been observed. This is why PWT1D should control blood sugar levels with frequent glycaemia checks and subsequent adaptations to insulin delivery and improve their way of life to prevent much serious disease. In addition, routine diabetes care, which includes diet and fitness activity (P.A.) during the current pandemic, seems to have been interrupted and can contribute to worse outcomes. The government of Italy implements special measures in the sphere to restrict viral transmission across persons and territories impose national quarantine reduces the social interaction and travel and "stay at home" as a basic tool to reduce people's exposure to the virus according to Istituto Superiore Della Sanità. Unfortunately, mandated travel restrictions and outside activities, including regular exercise and P.A, inevitably interrupted millions of people's daily routine activities. Although it remains a priority to contain the virus spread, action on a wide variety of public health perspectives is also essential. Few guidelines for public health have been developed with regard to daily practice or P.A. routines. PWT1D was the

recommended guidelines on risk reduction, including social isolation, were followed and primary techniques for glycemic control and hypoglycemic risk reduction were stressed as important to optimal glycemic control: regular blood glucose monitoring, food and regular P.A. practice. We assume that quarantine reduces social and environmental exposures with possible health impairment and consequently P.A. practices (gyms and outside activities). The reduction of P.A. could, in particular, have changed euglycemia support in PWT1D, even among active individuals. Safe and regular practice should safeguard excellent psycho-physical well-being and its protection benefits. We anticipate that the increased use of technology, such as particular training channels, applications, and materials shared on social media, could help individuals train at home, despite the closure of green areas, gyms and swimming facilities. This study is intended to analyze the P.A. Contrast level Covid 19 illness in Italians with type 1 diabetes before and after National Quarantine, and glycaemia variation values (55). Exercise can help you to control your blood sugar level and weight if you are diagnosed with Type 2 diabetes. They may also lessen their risk of heart and stroke, minimize cardiovascular risk and encourage overall wellness. Exercise can also be helpful in preventing diabetes in prediabetes patients. The ADA encourages people to achieve moderate to vigorous aerobic activity at least 150 minutes a week. According to the ADA, it is important, for example, to do at least two strength training sessions every week without contraindications, such as moderate to severe retinopathy. The benefits of exercise are independent of weight loss. However, adherence to an exercise program must be consistent to obtain lasting results. If patients are sedentary and are considering starting an exercise program, it is a good idea to check with a doctor first to make sure there are no special restrictions or precautions. It is always a good idea to start gradually and develop their personal goal.

12. Management

12.1 Management of physical exercise in diabetic patients during COVID-19;

The Diabetic Mellitus routine is a component of physical activities. The physical outdoor activities of those with diabetes are restricted by lockdown and social isolation. There are additional physical activity programs within the safe bounds of the home (56). The practice standards, including the American College of Sports Medicine, the American Heart Association and the Canadian Diabetes Associations, have been urged for regular training exercises. Training has demonstrated improved immunity, but care can be taken and busy spots like gymnasiums and swimming pools are avoided. Regular physics reduces back discomfort, constipation, edema, and bloating. It stimulates energy and mood, encourages rest, minimizes weight gain and decreases post-prandial hyperglycemia. Caution should be exercised in individuals with coexisting cardiovascular disorders and a history of hypoglycemia according to their capacity and fit hood level. Continuous blood glucose monitoring is essential because of the danger of hypoglycemia in type 1 diabetes patients during exercise (57). Here are some exercises that help patients reach their fitness goals.

12.1.1 Free Hand Exercise

- Walk up and down for a minimum of 6 floors of 8 staircases. This is not recommended for people who are not regularly exercising type 2 diabetes.
- Jump rope
- Use small weight and fitness equipment such as rubber straps, bowls, wrist weights, knuckles and heavy objects pockets. Found objects such as pans, cups, bottles of water or even small backpacks of objects of various weights can also be used.
- 2 series of 20 jumping jacks.

- 2 series of 15 crunches.
- 2 series of 15 forward flex.
- 2 series of 10 rowing exercises using dumbbells and slight forward flexion.
- 2 series of 8 push-ups.
- 2 of 8 sitting or standing hand-weight lifts.
- 5 minutes of treadmill training.
- 3 series x 15 squats.
- 20 minutes treadmill training
- Final stretching and relaxation.

12.1.2 Home Cycling

Approximately half of public with type 2 diabetes suffer from arthritis. There are two common risk factors, including obesity. Diabetic neuropathy, a situation that occurs in people with type 2 diabetes if the nerves are damaged, can also cause joint pain. When patients experience lower joint pain, consider choose two 15-minute, variable-intensity stationary bicycle exercises. On a reclined bike the sessions can be longer, since backrest lowers effort (58).

12.1.3Stretching exercises

This means active stretching such as Pilates, barre and yoga. There are plenty of videos online that can show how to do these things (59).

12.1.3 Swimming at own pool

Water activities offer another friendly choice to joint workout. For example, the patient's heart, lungs and muscle can be exercised by swimming, water aerobics, water jogging, and other aquatic sports while playing low joint stress. In addition, a 2017 trustworthy review source indicated that water exercise can contribute to lower blood sugar levels much like on-the-ground exercise.

12.1.4 Team sports

If patients find it difficult to motivate themselves to exercise, it may be helpful to join the recreational team. The ability to socialize and engage with teammates could help them discover the inspiration they need every week. Also, many recreational sports offer good aerobic exercise. For example, consider trying basketball, soccer, softball, partner tennis, or the latest Frisbee**.**

12.1.5 Aerobic dance

Registering for aerobic dance or other fitness classes can also help patients achieve their goals. For instance, Zumba is a gym which combines dance with aerobic movements for a quick workout. A study in 2015 found that after 16 weeks of participating in Zumba classes, women with type 2 diabetes were more motivated for training. Their aerobic fitness improved and their weight was lost.

12.1.6 Weight lifting

Lifting weight and other enhancements help increase muscle mass by increasing the calorie consumption each day. Strength training can also contribute to better blood sugar management, advises the ADA. They can use weight lifting machines, free weights or even

heavy items like canned food or water bottles if they want to incorporate weight lifting into their weekly training routine. To learn how to raise weights safely and effectively, please study a weightlifting class or request guidance from a professional fitness trainer.

12.1.7 Exercises with resistance bands

Weight is not the only way to strengthen muscles in patients. They can undertake a wide range of resistance bands training activities. Talk with a trainer, Take a band resistance course or watch a band resistance video to see how they are incorporated into training courses.

According to a recent research published in the Canadian Diabetes journal, resistance band exercise can also provide modest benefits for controlling blood sugar.

12.1.8 Calisthenics

Patients employ their own body weight in Calisthenics to improve their muscles. Common workouts include push-ups, pull-ups, squats, lungs, etc. Whether you want to build their muscles with weights, strength ranges or your own body weight, strive to exert your body's main muscle groups. To give their body time to recover, take a day off from muscle-strengthening activities between each strength-training session, suggests the ADA.

12.1.9 Pilates

Pilates is a popular gym that improves core strength, coordination and balance. It may also assist to improve the regulation of blood sugar, according to a new study of older women

with type 2 diabetes. Please enroll at your local gym or in the Pilates studio in a Pilate class. There are also several grape vines.

12.1.10 Yoga

In this regard, Type 2 diabetes patients who are now in isolation or quarantine, may benefit from a well-defined regimen that helps to offset any excess glucose and fosters glucose homeostasis (60). According to a 2016 research, yoga can help regulate blood sugar, cholesterol and weight levels in persons with type 2 diabetes. They can also contribute to lowering the blood pressure of the patient, enhance sleep quality and improve mood. If you would want to try yoga, register online at a local studio or gym for a class. A skilled practitioner can assist you learn how to transition from one position to another utilizing correct breathing and posture practices. (61–65).

Conclusion:

The risk of COVID-19 is higher for people with diabetes Mellitus and symptoms are aggravated if the condition is contracted. In addition to broad COVID-19 preventative practices, prevention is mostly done through thorough personal diabetes management. Therefore, health education on glycemic control needs to be re-emphasized so that the detrimental impacts of COVID-19 on people can be minimized. This retrospective study aimed to evaluate the clinical characteristics of diabetes patients with severe COVID-19 and the function of diabetes in severe COVID-19 patients. The main evidence shows that serious COVID-19 patients were older than severe COVID-19 patients without diabetes and had a more severe inflammatory response. With addition, the Kaplan-Meier Survival Curve demonstrated a considerably decreased number of severe COVID-19 patients in diabetes. Previous research indicated that the prevalence of diabetes in severe COVID-19 patients in Chinese adults was approximately 20%, compared with 11.6%15. But there were few research focusing on the clinical characteristics of severe diabetic patients COVID19 and the direct association in serious COVID-19 patients between diabetes and their survival rates. We found that in severe COVID-19 the prevalence of diabetes was up to 24%, based on previous findings. COVID-19 was most common in patients with diabetes, which can be due to low lung functions in diabetes patients. However, the mechanisms for lung impairment remain obscure in diabetes. Animal studies have shown that glycosylation of lung tissue collagen in the diabetes model has led to alveolar-capillary microangiopathy and interstitial fibrosis. This procedure mediated using the oxidase nicotinamide adenine dinucleotide (NADPH) and the angiotensin II. The autopsy also identified the thickening of pulmonary basal lamina in patients with diabetes 18 which could have an effect on pulmonary diffusion. Our study shows that severely COVID-19 diabetic patients were of a similar clinical nature to serious COVID-19 diabetes-free

people. Severe diabetic COVID-19 patients exhibited a high proportion of cough and dyspnea symptoms, however due to the short sample size, there was no statistically significant change. Increased white blood cells, neutrophils and reduced lymphocytes where clear laboratory abhors in our trial in severely diabetic COVID-19 patients compared to severe COVID-19 diabetes-free patients. This finding may suggest a serious virus infection in diabetic patients and were likely to be associated with bacterial infection. In severe COVID-19 diabetic patients included hs-CRP, procalcitonin, IL-2, IL-6, IL-8, and TNFα had furthermore been more severe inflammatory indicators. Several studies have indicated that CD4+T cell differentiation by Th1, and Th2, 12,19 20, cells and Th1721 cell and Treg cell dysfluent can be activated through diabetes and obesity. This changed the proinflammatory and anti-inflammatory balance22. The system imbalance can cause inflammatory cytokines to get out of the system. In addition, the urea-nitrogen, albumin and NT-pro BNP levels were also increased in our study. These anomalies imply the possible association between COVID-19 infection and increasing systemic damage in diabetic patients. The risk of severe acute respiratory syndromes (SARS), H1N1 flu virus and Middle East Respiratory syndrome (MERS) consequences has been increased by diabetes. 23-26 Covid-19 has been characterized as coronavirus β with SARS-like sequence of 85 percent, and MERS-like sequence of 50%. 27 The Structural Protein S covers lung cells by the binding to receptors, like ACE2 and CD147, of S-structural protein S. 28 Severe pneumonia causes lung destruction, causing acute respiratory distress and septic shock injuries. The severe COVID-19 patients were particularly prone to mechanical ventilation and rigorous treatment in our study, as was the case in other studies; they were greater deaths than those without diabetes. In comparison to the patients without diabetes, the median survival duration from admission to hospitals has been drastically reduced. Lung dysfunction and inflammation have been described in the previous section for

diabetes in diabetes patients, which links hygienic mortality and shorter survival periods. Hyperglycemia has been a risk factor for mortality as another potential mechanism. 25 DIA-induced hyperglycemias have been linked to aggressive glycosylation, which has led to 29 overproductions of advanced products for glycemic treatment. And ridiculous glycosylation was seen to be linked to immunoglobulin malfunction. 30 IgG Fc domains may result in glycosylation dysregulation which may worsen severe infections (31). And for the following reasons, hyperglycemia may be: (1) Severe COVID-19 patients had no regular intakes and nutritional aid was mainly provided by infusion of intravenous fluids. (2) Gastric absorption problems may be caused by Covid 19. (3) Therapy for steroids. (4) Blood glucose variations can be caused by the virus itself. Covid-19 was reported to use ACE2 as a lung, pancreatic and other organs as its receptor, 27. Covid-19 can bind to ACE2 in the pancreas and cause pancreatic damage and hyperglycemia. Our data were consistent with prior studies that most non-survivors were men in diabetic patients with severe COVID-19. 7 ACE2 was about thrice higher in men than in women as the specific mechanism of COVID-19 vulnerability for men. 32 non-survivors, according to prior studies, also experienced significant inflammation and damaged heart, liver, renal and coagulation. Following are the strengths of the study. First, among patients with severe COVID-19, our study indicated that diabetes was associated with significant mortality and low survival rates. Secondly, clinical information is collected from severe COVID-19 patients in the authorized Wuhan COVId-19 facility in Tongji Hospital. Thirdly, all authors are physicians of the first line who are able to monitor participants firsthand. Our study has a number of limitations. The sample size was small first. Secondly, our research employed a retrospective approach. Third, our study showed a significant fatality rate. That Tongji Hospital is the designated hospital for serious patients can be explained. In fact, mortality in patients with severe COVID-19 is significantly declining with the accumulation of

therapeutic experiences. Consequently, a large sample still needs further study on the actual mortality in serious COVID-19 patients. In summary, our findings show the greater probability of mechanical ventilation and ICU acceptance and higher death for severe COVID-19 patients who had diabetes. Severe COVID-19 diabetic patients are severely inflamed.

In addition, our data imply that diabetes can be seen as a death risk factor in severe individuals COVID-19. Finally, should consider intensive diabetes treatment in the management of COVID-19 (66,67). Patients with diabetes are at improve risk for serious complications from COVID-19, which can include CAD. Clinicians continually seek alternative and individualized patient care delivery ways for treating CAD to balance the necessity for extensive insulin therapy, minimizing healthcare personnel' exposure and protecting EPP. These cases emphasize significant concerns for deciding the best strategy to treat CAD, including the method of insulin and the place of treatment. Immediate diagnosis and treatment of CAD in ICU is suggested in severely unwell and medically complex patients. The strategic use of subcutaneous insulin is supported by high-quality data for people with uncomplicated mild/moderate CAD. It can also help satisfy the particular needs of a pandemic in the health system. CAD prevention, involving the maintenance of vital clinical services via telemedicine and the proactive provision of standard preventive information to patients, is essential wherever practicable. In order to understand better the incidence and disease of CAD in SAR-CoV-2-infected persons, further research is required (68–71). During the COVID-19 epidemic, D.M. sufferers have faced and continue to face considerable difficulties. Even if they are not infected, they are at risk of having dysregulated glycemic control as a result of general restrictive measures that undermine and modify the quality of medical care, particularly for chronic illness patients. Furthermore, regulatory policies in several countries have limited city dwellers'

physical exercise. Furthermore, many persons with diabetes missed scheduled diabetes monitoring visits, either because hospitals discontinued routine outpatient visits or because people with diabetes canceled their visits because they were afraid of being exposed to SARS-CoV2 in hospitals. Scheduled patients with D.M. are more likely to have serious and perhaps deadly consequences if they become infected. However, it would be incorrect to imply that COVID-19 poses a similar risk of severity and fatality to all D.M. patients. Certain clinical and biological characteristics determine high-risk phenotypes within the D.M. population, and should clearly characterize these prognostic markers in future studies. Long-term D.M., old age, concurrent obesity and other cardio metabolic problems, significant insulin resistance or subclinical inflammation are all phenotypic traits that have yet to be discovered. More study is needed to determine which subgroups of diabetic patients are likely to benefit the most from certain antiviral, immunological modulatory, and other medicinal system treatment techniques, which we're emerging as an important priority at the time of COVID 19 (72,73). In the United States, the results and mechanisms of co-morbidity and COVID-19 modulation of viral pathogenesis are scarce. Some of them, such as African Americans, Hispanics, Asians, and Native Americans, are vulnerable and problems in the health-care system make them even more vulnerable. Identifying clinical and biochemical parameters the use of multi- biotic approaches that predict the severity of COVID-19 in D.M. the use of giant information units is urgently needed (74,75). Studies in humanized ACE2 mice (hACE2) and non-human primates aimed at understanding how hyperglycemia, hyperinsulinemia, and hypoglycemic agents affect the pathogenesis of COVID-19 and how D.M. affects the efficacy of vaccines and investigational antiviral agents currently in trials are justified. Finally, we need to develop novel ways of providing care to our D.M. patients using e medicine remote patient monitoring and wearable technologies. As the worldwide pandemic progresses and spreads quickly across the United

States, social isolation measures will help with the transition. Nonetheless, basic and clinical research are urgently needed to solve the many critical and unanswered concerns (76–79).

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