

Challenges and Opportunities for Diabetes Care in the Philippines in the Time of the COVID-19 Pandemic

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Patients with diabetes constitute a vulnerable population in the surge of the COVID-19 pandemic. COVID-19 is a viral illness caused by the virus SARS-CoV2 which originated in China, presenting with a range of clinical manifestations from fever, cough, myalgia, resembling a systemic viral illness which can progress to acute respiratory failure, and multiple organ dysfunction. In the Philippines, the burden of both diseases is high. The prevalence of diabetes, a chronic, metabolic disorder characterized by hyperglycemia, is about 7.1% in adults between 20-79 years old in 2019.¹ The country has been afflicted by a COVID-19 outbreak and as of this writing, there are already more than 6000 cases of COVID-19 infection, and more than 400 individuals have died of the disease in the Philippines. This led the government to declare an enhanced community quarantine (ECQ), which entails restricted operation and movement of people and goods, except for essential services, throughout the island of Luzon—the largest island in the Philippines, which comprises of about 57 million people, last March 16, 2020. This ECQ has been extended twice, and will remain enforced until May 15, 2020 at the earliest,² in order to control the outbreak while boosting testing capacity and the ability of healthcare facilities to respond to COVID-19 cases.

Those with diabetes can be both a direct and a collateral victim of this pandemic. Poor blood sugar control may lead to an immunocompromised state, leading to an increased risk of contracting and developing the complications of COVID-19. As a chronic disease, diabetes entails multimodal management integrating medical nutritional therapy, exercise, pharmacologic therapy, close monitoring and follow-up. Quarantine measures and restrictions in mobility have made diabetes care more challenging. The other way that persons with diabetes become collateral damage is because of the focus now on treating persons who have the COVID infection. The Philippine government has designated 19 COVID-referral hospitals in the National Capital Region, and 75 facilities throughout the Philippines. These referral hospitals were preferentially equipped by the government with manpower, personnel protective equipment, medications and other needs to be able to manage persons infected with COVID who are referred to their hubs from the community or other hospitals. However, most of the other

hospitals still mostly admit only patients with COVID. This has led to a significant number of patients who would have been previously admitted to be turned away from hospitalization to prevent them from becoming infected, and instead given medications for home management. This is true for various disease conditions, including persons with diabetes.

COVID-19 INFECTION IN AN INHERENTLY HIGH-RISK POPULATION

Several theories have been proposed to explain the increased susceptibility of patients with diabetes to acquiring COVID-19 infection and developing fatal sequelae of the disease. Molecular studies have shown that in people with diabetes, the expression of the angiotensin-converting enzyme 2 (ACE-2) is augmented. SARS-CoV2, the virus responsible for the illness COVID-19 binds to its target cells through ACE-2. It is hypothesized that an increased expression of ACE-2 leads to a higher risk of COVID-19 infection with severe manifestations.³ Another theory raised is impairment in the immune response of patients with diabetes in the form of dysfunction in the lymphocyte proliferative response, complement activation, monocyte, macrophage, and neutrophil actions.⁴ Endothelial dysfunction also plays a role in the poor outcomes of T2DM patients with COVID-19 infection.

In a study of 1527 patients in China, 9.7% of the cohort had diabetes. It was found that the risk of developing severe clinical manifestations necessitating admission to an intensive care unit was twice higher in patients with diabetes and hypertension compared to other patients.⁵ In China, the mortality rate of patients with diabetes and with COVID-19 was as much as 7.3%, which was significantly higher than those of patients without any co-morbidities, which was at 0.9%.⁶ Indeed, the pandemic poses new demands on diabetes care in a developing country such as the Philippines.

CHALLENGES REGARDING NUTRITION

Diet is a central aspect of diabetes management. The COVID-19 pandemic gave rise to barriers to the attainment of adequate and optimal nutrition for patients.

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A diabetic diet consisting of a balanced diet made up of carbohydrates from fruits, vegetables, whole grains, legumes, and low-fat dairy products, and protein⁷ is difficult to obtain in the time of COVID-19 because lockdown measures restricting mobility and tightly regulated periods to buy food result in limited food choices. Some localities in the Philippines have been placed under extreme enhanced community quarantine and hard lockdown in order to control outbreaks, which has made it difficult for people to buy fresh food. Under a quarantine set-up, most people resort to buying food that do not spoil easily such as canned goods and processed food so that supplies would last until the next market day. Canned goods and processed food usually contain a lot of additives, with a high amount of sodium and fat. Such food choices are detrimental for patients with cardiovascular and renal complications of diabetes.

Another co-morbidity that is usually associated with diabetes is obesity, and the burden of this disease is also significant in the Philippines at about 4.7%.⁸ High prevalence clusters of obese individuals are usually found in urban areas,⁹ because of the higher intake of processed, calorie-dense foods, and lower level of physical activity compared to their rural counterparts, who are usually engaged in farming or fishing as livelihood. Patients with diabetes and obesity have diminished food options during the lockdown, making them unable to comply with their nutritional prescriptions. In the Philippines, the officials of the smallest government unit, the *barangay*, usually distribute foodstuffs, which is uniform for everyone, making it difficult to adhere to the diabetic diet.

Malnutrition is a significant health problem in the Philippines, even prior to the surge of COVID-19 cases. In a cross-sectional study done locally, moderate and severe undernutrition was found to be as much as 20.5%.¹⁰ Restrictions in trade have caused significant reductions in the supply of nutritious food, thereby worsening malnutrition across populations. The enhanced community quarantine also had dire economic consequences. Because of the lack of employment during this period, a lot of citizens do not have the financial resources to purchase even the most basic needs such as food. Government assistance strove to mitigate the economic ramifications of the pandemic through the provision of food and other basic necessities but issues on access and sustainability of such assistance still need to be addressed.

CHALLENGES WITH PHARMACOLOGIC MANAGEMENT

Majority of patients with diabetes are on multiple drugs for glycemic control and cardiovascular protection. The COVID-19 pandemic gave rise to barriers to access to pharmacologic therapy on multiple levels. Lockdown measures, not only in the Philippines, but in many parts of the world, led to interruptions in the manufacturing and delivery of drugs, causing a lot of medications to be out-of-stock. For instance, China and India, both of which are major sources of imported drugs, are severely hit by the pandemic, thus creating major roadblocks in the supply chain. Another barrier to access is the inability of patients to refill their prescriptions in the setting of an enhanced community quarantine. In order to address this hurdle,

the Food and Drug Administration (FDA) issued a circular (No. 2020-007) last March 17, 2020, honoring electronic prescriptions made by physicians.¹¹ This is a positive move in terms of improving access to medications; however, several gaps remain such as indigent patients being unable to obtain prescriptions due to lack of access to the Internet. It is still unclear whether or not old prescriptions will be considered valid in pharmacies during this time of the pandemic. Lack of mobility also affects access to medications and this drawback is more pronounced in rural areas where there are only a limited number of pharmacies that are operational during the lockdown and they are usually few and far apart. Many patients are unable to travel to these drug stores because of the ban on public transportation during the lockdown.

The most prevalent barrier to access is the high cost of medications, especially for indigent individuals who have difficulty purchasing their own medications even before this pandemic. A significant number of patients with diabetes are daily wage earners, and the loss of income during the enhanced community quarantine makes them unable to secure their medications. Access programs from the Department of Health for both insulins and oral anti-hyperglycemic agents are halted during COVID-19. Even households from the middle-income class have also lost their livelihood during the enhanced community quarantine and patients from this socio-economic class do not receive full government assistance financially and are seldom enrolled in these access programs prior to the pandemic. The pandemic indeed magnified inequities in care. With this, another threat unfolds after the COVID-19 pandemic- with poor control of diabetes and other co-morbidities during this crisis, there will be a large number of patients seeking care for diabetes-related complications thereafter.

GAPS IN FOLLOW-UP AND MONITORING

Diabetes is an intricate chronic disease that entails regular follow-up and monitoring. Assessing the status of patients with diabetes in the time of COVID-19 has been challenging both in the hospital and outpatient setting. The need for consultation and monitoring ought to be balanced with the urgency to reduce the exposure to infection of both patients and healthcare workers. Patients who have issues with health literacy, problems with mobility, and lack of access to resources such as mobile phones and the internet are at high risk of succumbing to diabetes-related morbidity and mortality in the time of COVID-19.

OPPORTUNITIES FOR INNOVATIVE DIABETES CARE DURING THE COVID-19 PANDEMIC

Recognizing that patients with diabetes represent a highly susceptible population, cooperation between healthcare workers, institutions, and patients gave rise to innovative solutions to respond to the challenges brought about by the COVID-19 pandemic. These strategies emphasize patient empowerment especially in the aspects of self-monitoring of blood glucose, adherence to lifestyle modification, hygiene and pharmacologic management, and monitoring for treatment-related adverse events like hypoglycemia. Tools like instructional videos, digital pamphlets, and infographics are increasingly being used today to enhance

the health literacy of patients and caregivers. More efficient systems such as continuous glucose monitoring systems that enable real-time assessment of glucose control with minimal risk of transmission have been put in place.

Telemedicine, which pertains to the delivery of healthcare services by medical professionals in a setting where in physical distance is a limiting factor through information and communication technologies,¹² is now widely used in the country. This platform facilitates physician-patient interaction, allowing for the analysis of subjective complaints, blood glucose levels, and the provision of treatment and lifestyle advice. Through telemedicine, physicians are able to advise patients more thoroughly on how to cope in terms of their nutrition, lifestyle and medications during the lockdown period. For instance, patients receive advice on better food choices such as fresh vegetables and home-cooked meals to consume, rather than calorie-dense, processed foods that are high in sodium and fat. Lack of exercise is also an issue discussed with patients with diabetes and strategies to address this such as home exercises (dance, stretching, yoga) that can be performed in a limited space are raised. Medication adjustments and sick day guidelines are also discussed.¹² Previous experiences suggest that telemedicine can be an effective tool for diabetes care. In a Cochrane review involving 2,768 patients from 21 randomized controlled trials, it was found that the HbA1c of patients on the telemedicine arm decreased by 0.31% ($p < 0.001$).¹³ Telemedicine also forged closer networking among physicians in the Philippines and also abroad, enabling physicians from different working environments, with varying levels of experience with treating diabetes and COVID-19, to share helpful insights with each other.

Another key strategy in improving diabetes care in the time of COVID-19 is close coordination among healthcare providers, local government agencies, and other organizations giving aid in order to deliver services that are compatible with the needs of patients with diabetes. Nutritionists at the local government level can be tapped to provide diabetic diet for patients.¹⁴ Diabetes-specific formulas can also be distributed to patients with diabetes for either supplemental nutrition or meal replacement to improve glucose control. Fresh produce, instead of mostly canned goods, can be provided by local government units as well, to promote more healthy food choices among its citizens. It is paramount for barangay health care workers to identify patients with diabetes in the community because these patients should keep a vigilant eye on their symptoms and there should be a lower threshold for COVID-19 testing and hospitalization of patients with diabetes.

FUTURE CHALLENGES AHEAD

Patients with diabetes are especially vulnerable to the harsh consequences of the COVID-19 pandemic. Holistic diabetes care involves protecting these patients as healthcare systems transition to the “new normal.” Once healthcare facilities reopen for diabetes follow-up, anticipatory care involves assessing patients for end-organ damage, checking vaccination status such as for influenza and pneumococcal vaccinations, and also evaluating for anxiety and depression levels of these patients in order to

facilitate appropriate psychiatric referrals and assistance if necessary. Adhering to precautions against COVID-19 infection such as regular handwashing, cough hygiene, and social distancing,¹⁰ must be inculcated to patients even after lockdown measures are lifted. Clinics must also be restructured to incorporate safety equipment and facilities to avoid the spread of infection. As we usher in a “new normal” for persons with diabetes, greater collaboration between the diabetes specialists- endocrinologists- and doctors in the community is encouraged so that not only preventive care is continued at the grassroots, but screening for diabetes and its complications continue with timely referral to specialists. The anticipated future then, after this crisis, is one of strong partnerships between doctors, patients, and institutions which are pivotal in improving the quality of diabetes care amidst formidable challenges in this global pandemic.

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