

Management of Diabetic Foot Disease During the Covid-19 Pandemic

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1. Abstract

1.1. Aim: The new Coronavirus crisis started in December 2019 and spread globally all over the world. Patients at high risk of severe COVID-19 or death have several characteristics, including advanced age and male sex, and have underlying health issues, such as diabetes mellitus. We aimed to determine the impact of the pandemic on diabetic foot disease services and the steps taken within our hospital to support these patients.

1.2. Material and Methods: We evaluated 52 patients who require anti-biotherapy, drainage, and debridement for neuro-ischemic and septic diabetic feet followed-up for a diabetic foot with the "Chronic Wound Polyclinic" we established within our hospital between April and December 2020.

1.3. Results: 52 patients (n = 52) were followed up (female/male=18/34). The mean age was 53.3 (median=48). All 52 patients were given remote assistance in managing their diabetes and maintaining good glycemic control. All patients were encouraged to examine their feet and to take regular foot care. Due to the presence of pandemic, visual data of recently healed ulcers and existing wounds were obtained from all patients via mobile phone. Since mildly active symptoms were observed in 38 patients, they were called to the hospital. In 12 of these 38 patients, symptoms suggesting the development of ischemic ulcer were observed and debridement was applied. None of the patients were amputated and none of them were mortal.

1.4. Conclusion: The COVID-19 global pandemic poses considerable health hazards, especially for patients with diabetes mellitus.

We think that we can manage our patients in the high-risk group in our clinic in the best possible way.

2. Introduction

In December 2019, a mass outbreak of Coronavirus disease 2019 (COVID-19) occurred in Wuhan, the People's Republic of China and the disease has spread to other regions of China and around the world [1]. The pneumonia epidemic caused by a novel coronavirus was issued as a public health emergency of international concern by the WHO (World Health Organization). As of 31 January 2021, 101, 917, 147 globally confirmed cases of COVID-19 have been reported on the WHO COVID-19 dashboard, including 2.205.515 deaths [2]. The fatality rate for COVID-19 has been estimated to be 0.5–1.0% [3]. Patients at high risk of severe COVID-19 or death have several characteristics, including advanced age and male sex, and have underlying health issues, such as cardiovascular disease (CVD), obesity and/or type 1 diabetes mellitus (T1DM) or type 2 diabetes mellitus (T2DM) [4]. Diabetes mellitus represents a growing public health concern with an increasing prevalence of diabetes estimated at 3.6 million people in the UK with an expected further rise to 5 million in the coming 10 years. The basic and clinical science of the potential inter-relationships between diabetes mellitus and COVID-19 has been reviewed. As all healthcare resources have been mobilized to combat this pandemic, most routine clinical trials had to be suspended. We aimed to determine the impact of this on diabetic foot disease services and the steps taken within our hospital to support these patients.

3. Method

We retrospectively collected data of patients during the COVID-19

pandemic period. 52 patients were included in this study. We evaluated patients who require anti-biotherapy, drainage, and debridement for neuro-ischemic and septic diabetic feet followed-up for a diabetic foot with the "Chronic Wound Polyclinic" we established within our hospital between April and December 2020. This study was approved by the institutional review board of Istanbul Bagcilar Training and Research Hospital, and consent was waived for its retrospective nature.

4. Results

52 patients (n = 52) were followed up during this period. 34 of the patients were male and 18 were female. The mean age was 53.3 (median=48). All 52 patients were given remote assistance in managing their diabetes and maintaining good glycemic control. In this way, glycemic control was achieved with diet and correct medication use. All patients were encouraged to examine their feet and to take regular foot care. Thus, possible calluses in the foot-print areas were prevented.

Due to the presence of pandemic, visual data of recently healed ulcers and existing wounds were obtained from all patients via mobile phone. Evaluation of the risky foot was provided remotely with the visuals of the existing ulcers.

Since mildly active symptoms such as redness, pain, swelling, and discharge were observed in 38 patients, they were called to the hospital and anti-biotherapy was arranged. In 12 of these 38 patients, symptoms suggesting the development of ischemic ulcer were observed and debridement was applied (Figure 1).

None of the patients were amputated and none of them were mortal. Apart from these patients, it was decided to apply epidermal growth factor to 7 patients. Injections of these patients were performed without delay and the open wounds of 5 of them were completely closed (Figure 2).



Figure 1: Photograph of a diabetic foot patient who has undergone debridement and controlled with anti-biotherapy



Figure 2: Before and after photograph of a diabetic foot patient who has undergone debridement and applied Epidermal Growth Factor

5. Discussion

Patients with significant comorbidities have an increased risk of worsening their results due to Covid-19 infection, so these patients should be protected and called to the hospital when necessary. The presence of diabetes mellitus and the individual degree of hyperglycemia seems to be independently associated with COVID-19 severity and increased mortality [4, 5]. In human monocytes, elevated glucose levels directly increase SARS-CoV-2 replication, and glycolysis sustains SARS-CoV-2 replication via the production of mitochondrial reactive oxygen species and activation of hypoxia-inducible factor 1 α and so, hyperglycemia can support viral proliferation [6]. In accord with this assumption, hyperglycemia or a history of T1DM and T2DM were found to be independent predictors of morbidity and mortality in patients with SARS [7]. Patients with diabetes mellitus typically fall into higher categories of SARS-CoV-2 infection severity than those without, and poor glycaemic control predicts an increased need for medications and hospitalizations, and increased mortality [8]. Several mechanisms are thought to be responsible for an accentuated clinical severity of COVID-19 in people with diabetes mellitus like glucotoxicity, endothelial damage by inflammation, oxidative stress, and cytokine production contribute to an increased risk of thromboembolic complications and damage to vital organs in patients with diabetes mellitus [9]. All of these mechanisms are now believed to contribute to the poor prognosis of patients with diabetes mellitus and COVID-19. However, some limited research is available on COVID-19 and DM. This is why we think that we have to protect and watch over patients with diabetes comorbidity from this obscurity.

Due to the difficulties observed during the pandemic, the decrease in the patient acceptance capacity of clinics and hospitals, the inadequacy of healthcare personnel and the formation of massive personnel disease due to the infection of these employees, the inability to perform interventional radiological procedures, restriction of the transportation of patients who have to use public

transportation, creative methods, and solutions in our clinic. had to be found. Providing distance education of patients, encouraging self-care, emergency triage decisions are made by teleconference method and face-to-face care needs, in case of need for surgical intervention, the risks for patients and personnel are reduced and interventions are carried out. In this way, we think that we can manage our patients in the high-risk group in our clinic in the best possible way.

6. Conclusion

In conclusion, the COVID-19 global pandemic exposure considerable health hazards, especially for patients with diabetes mellitus. Therefore, preventing infection in the first place is still the best solution for diabetic foot disease. Under these conditions, patients with diabetes mellitus should make a stable effort to maintain a healthy lifestyle and to decrease potential risk factors, even in the pandemic. The optimal management strategy in the pandemic for such patients, the choice of glucose-lowering, anti-biotherapy, and debridement, is an important topic for current and future research.

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