Editorial

Proposals on self-care for diabetic foot during the COVID-19 pandemic in Brazil

The COVID-19 pandemic, since its beginning, has caused massive negative impact on countries health care system and disruption of health care routine to a variety of health issues, such as chronic non-communicable diseases (CNCD). Among CNCD, the diabetes mellitus (DM) concentrates a number of major concerns of health authorities given that observational studies have been demonstrating a high prevalence of individuals with previous diseases among those admitted to hospitals due to the outbreak of novel coronavirus, especially the severe cases.(1)

So far, findings have been reported on higher susceptibility or increased risk of individuals with diabetes for COVID-19. In addition, studies published in the literature have reported that diabetes contributes to rapid progression and development of the severe type of the disease, including pneumonia caused by severe acute respiratory syndrome (SARS). Patients with diabetes seem to be more likely to die from COVID-19.[2]

There are a variety of theories seeking to explain the association between diabetes and severity of COVID-19 infection. Innate immunity, which is the first line of defense against the virus, would be compromised among individuals with high glycemic index, and may enable the unstoppable proliferation of host-pathogen. In addition, diabetes is characterized by an exacerbated proinflammatory response with high levels of circulating cytokines, mainly interleukins (IL) IL-1, IL-6, and tumor necrosis factor (TNF) alpha.[3] This environment is crucial, particularly in the second and the third phase of the disease, characterized by the pulmonary injury and hyperinflation status evolving to severe forms of COVID-19.[4]

Among those patients with diabetes and foot injuries, the up-regulation of inflammation is still the most manifested feature, given that diabetic neuropathy, peripheral vein disease, and chronic changes that cause diabetic foot can also provide additional inflammatory response that is even more common in current active diabetic foot ulcer (DFU).[5]

In addition to the infection, one of the major complications due to the DFU is the worsening of hyperglycemia that changes the immune response of an individual and limit the fight against the virus. Of note is that these individuals are even more exposed to COVID-19 infection due to the need of seeking emergency unit for the DFU treatment. However, this exposition causes a new challenge "if to seek for emergency care is risky, to avoid emergency care offers higher chances of amputation and death". This editorial

will discuss proposals on self-care of individuals with diabetic foot during the COVID-19 pandemic in Brazil based on the experience of a public health care unit in the state of Salvador-BA.

Health care for individuals with diabetic foot in context of COVID-19 in Brazil

Considering the need of protective measures for those with diabetes because they are a group at risk, social distancing is seen as the most effective measure to reduce exposure to the virus. However, the adoption of this safety measure has negative consequences on life habits, physical activity and diet by favoring the consumption of ultra-processed and high-calorie food. In addition, social distancing may reduce the access to health care and glycemic control.[6] Negative impact of these facts are reinforced due to the social vulnerability of the majority of these patients and by losses in economic output that are needed to ensure social distancing. The disruption in care increases the exposition of these individuals to novel coronavirus infection and also exposes them to hyperglycemia and worsening in glycemic variability with progression of acute and chronic changes related to the DM. This latter fact can lead to an increase in number of patients seeking for emergency services that may cause overload on the health system that is struggling to be reorganized to respond to the consequences related with COVID-19 pandemic.[7]

Considering this panorama there is need that health services to focus on care triad for patients with diabetic foot, i.e., 1) to reduce the need of patients come to hospitals to prevent exposition and overload of the health system; (2) to guarantee home care conditions, considering an intervention plan that goes beyond the provision of medications, and adequate diet, functional, psychological, and self-care; (3) to ensure safety to enable a good progress of individuals.

Therefore, there is a need to provide support for home care, conditions to improve changes of limb salvage, to control or reduce injuries in cases with cure and, to guarantee care services at any time when needed.[8]

Many strategies have been discussed to propose a recommendation to address needs and particularities of these individuals. In general, remote monitoring is suggested as part of supporting tool to detect weakness that can represent a risk for the safety of patients. In the current context, screening for in-person patient appointment can be done using technology such as telemedicine that can connect those with an injury, evaluator, and specialist, and comply with social distancing measures. In addition, published literature provides evidences on potential positive effects in health outcomes when telemedicine is adopted as way to delivery health care for people with diabetes.[9]

Telemedicine is part of telehealth strategy that can be understood as a tool that uses information and communication technologies to provide initial care in health systems.[10] Brazilian Federal Medical Council defines telemedicine as “medical practice mediated by technologies for care, educa-

tion, research, disease and injuries prevention, and health promotion purposes".[11] Recently, during the outbreak of novel coronavirus, the Brazilian Ministry of health regulated the remote medical consultation (ordinance Nº 467, March 20, 2020)[12]. After regulation, remote care strategies have been discussed and implemented gradually in health care services throughout the country.

Overcoming challenges of providing care for individuals with diabetic foot

During COVID-19 pandemic, given the commitment with health care maintenance for individuals with chronic disease, especially those with diabetes and who have complications related with diabetic foot, the *Centro de Referência Estadual para a Assistência ao Diabetes e Endocrinologia* (CEDE-BA) located in Salvador, Bahia have created a structured screening system for patients who need care for diabetes. The center service is aligned with best global recommendations to delivery care for this population.

Telemonitoring activities to seek registered individuals with diabetic foot and who are already under follow-up at health unit started in March 20, 2020, just after health authorities recommended cancelation of non-essential health activities including those of outpatient health. So far, 349 phone calls have been made using data from medical record of each individual. To select individuals to be contacted we used as criteria calling those who showed-up to in-personal consultation scheduled during the period that activities were cancelled, in addition, we selected those who underwent debridement and banding within a period of three months, and also individuals whose procedures were recorded in outpatient production bulletin (OPB). Response rate to the first phone call was 51.0% (178). Those individuals who did not answer the phone were contacted through WhatsApp, and the second response rate reached 94.5% of response (330).

During active search, we identified 120 individuals (36.4%) with neuroischemic diabetic foot ulcers with potential risk for complication. They were evaluated, followed-up, and instructed using pictures that were forwarded by them using mobile communication apps. During calls, patients were questioned about presence of any respiratory symptoms to investigate potential cases of COVID-19 among participants.

Around 5.2% (17) of users had instable injuries with risk of amputation. These participants were referred to in-person consultation and instructed to take preventive measures to avoid exposure to novel coronavirus infection. Of them, 14 were able to managed and control condition at outpatient level without the need of hospital admission. Three individuals required high-complexity intervention, and they were refereed directly to specialist without the need of be first admitted at the emergency unit.

After stratification process, data were typed intro spreadsheets to follow-up, and scheduling was adjusted according to the need of each participant, i.e., most frequent care was offered for those at higher risk situation,

although in-person consultation was avoided at all times, the phone call was the preferable way of communication.

Although limited the telemonitoring program implemented by CEDE-BA during the coronavirus pandemic has been providing positive results in terms of reduced risk for users by avoiding in-person consultation at hospital settings. Of note is that complications related to diabetic foot ulcers often involve frequent hospital admissions.

This experience showed that providing a structured health care network that enable regular follow-ups, support for home care, and guaranteed success for worsening situation such as telemedicine tool and others little explored health care models seem to be successful for the treatment of chronic disease, particularly, in pandemic contexts. However, to institutionalize and incorporate telemedicine in health care process require establishment of adequate structures that guarantee communication and safe access to information about diagnostics and clinical managements as well as follow-up of ethical and legal precepts to guarantee patients' data confidentiality.

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