The Need for Diabetes Care Customization in the ICU at the Time of SARS-CoV-2 Outbreak

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To the Editor,

In China, among SARS-CoV-2-infected people, 12% of individuals have been reported to have diabetes mellitus (DM); this figure is quite low when comparing to reported figures in Italy [1]. In fact, as of April 2, 2020, from hospital records it has been possible to collect information on 1102 of 12,550 Italian fatalities from COVID-19 [2]. The mean number of concomitant diseases was 2.7 (median = 3): 31 patients (2.8%) were free of any other disease, 243 (22.1%) had only one, 263 (23.9%) had two, and 565 (51.3%) had at least three concomitant diseases [2]. Table 1 clearly shows that DM prevalence in deceased Italian COVID-19-positive patients was 31.5% [3]. The higher prevalence of DM in patients admitted with COVID-19 cannot be mostly a reflection of an older population known to be at higher risk for complications and mortality from COVID-19 because, while DM affects

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17.9% of men and 16.2% of women over 80 years of age [4] against its overall 6.2% prevalence in the general population (Fig. 1), the over-80s accounted for 29.8% of deaths among COVID-19-positive patients (Table 2) against an overall figure of 11.8% (12,550 out of 106,399 documented infections in the hospital setting) [2].

When putting together such a puzzle, we clearly understand why the prognosis in COVID-19-positive patients with DM can be very poor. Unfortunately, we cannot exclude that the worse prognosis in DM observed in this pandemic is not simply related to the disease itself. We must consider that in critically ill patients, treatment protocols often include extensive utilization of corticosteroids, which is known to further deteriorate infection-related hyperglycemia. It can be found in the same report from the Italian ISS (Istituto Superiore Sanità) that corticosteroids have been used in 34% of cases [2]. This is a serious situation if not well managed, because tight glucose control improves the length of hospitalization, the disease severity, and the mortality in ICU-staying patients with DM [5]. It is well known that, when facing critically ill patients with DM requiring ICU for acute respiratory failure, doctors have to progressively customize therapeutic protocols to ever-changing individual needs, comorbidities, and any symptoms of multiple organ/system involvement contributing to the clinical picture [6]. This particularly applies to the

Table 1 Most common comorbidities observed in COVID-19-positive deceased patients. Source: Istituto Superiore di Sanità [3] (modified)

| Disease	Number	Percentage
Ischemic heart disease	302	27.4
Atrial fibrillation	249	22.6
Heart failure	186	16.9
Stroke	127	11.5
Hypertension	794	72.1
Type 2 diabetes	347	31.5
Dementia	173	15.7
COPD	202	18.3
Active cancer in the past 5 years	188	17.1
Chronic liver disease	45	4.1
Chronic renal failure	259	23.5
Number of comorbidities		
0	31	2.8
1	243	22.1
2	263	23.9
≥ 3	565	51.3

Table 2 Mortality rate by age class in COVID-19-positive patients. Source: Istituto Superiore di Sanità [2] (modified)

Age groups (years)	Deceased [n (%)]	Mortality (%)
0–9	0 (0%)	0
10–19	0 (0%)	0
20–29	6 (0%)	0.1
30–39	29 (0.2%)	0.4
40–49	110 (0.9%)	0.8
50–59	479 (3.8%)	2.3
60–69	1448 (11.5%)	8.0
70–79	4196 (33.4%)	21.8
80–89	5029 (40.1%)	30.9
≥ 90	1251 (10%)	28.7
Unknown	2 (0%)	1.2
Overall	12,550 (100%)	11.8

management of hyperglycemia, and particularly to its swings [1], which can increase pro-inflammatory factors and eventually prevent patients from benefiting of any otherwise well-managed treatment protocols. That is why, despite being fully aware that support of vital functions represents the primary goal for physicians taking care of COVID-19-infected patients, and that health professionals are overwhelmed by the dramatic situation, we strongly suggest the need in the presence of DM for continuous subcutaneous glucose monitoring systems to let them enhance the chance for a better prognosis.
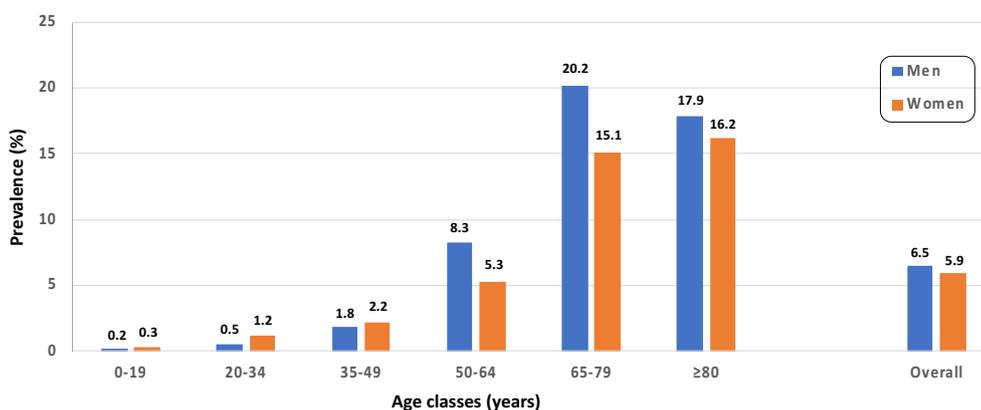
Fig. 1 DM prevalence in Italy as a function of age and gender according to the 2019 ARNO-Diabetes Report (modified) [4]

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