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In-hospital complications associated with COVID-19

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As the COVID-19 pandemic persists globally,[1] an emerging challenge is the shift from acute infection to the burden of long-term consequences resulting from the disease. Although a consensus terminology has not yet been reached, the post-acute stage of COVID-19 is mostly defined as 3 or 4 weeks after symptom onset, and long or chronic COVID-19 is defined as symptoms and abnormalities persisting or presenting beyond 12 weeks.[2,3] Most studies have focused on acute and subacute COVID-19, although evidence-based guidance for the management of long COVID-19 is limited.[4] Comprehensively understanding the health effects of COVID-19 from its acute to chronic stages is important, not only for the preparation of further waves of the pandemic, but also for assessing the burden on health-care systems due to COVID-19 consequences.

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In *The Lancet*, Thomas Drake and colleagues[5] report their prospective study of in-hospital complications of COVID-19 and the impact on clinical prognosis at discharge, initiated at the early stages of the pandemic. 73 197 adult patients were studied, of whom 44% were female and 73% were White, from 302 UK health-care facilities, with COVID-19 and admitted to hospital between Jan 4 and Aug 4, 2020. The study showed that among those admitted to hospital with COVID-19, a high proportion (49·7%) had at least one complication. The occurrence of complications was

not only associated with a higher risk of mortality during hospitalisation, but also reduced the ability of patients to self-care once discharged.

In most COVID-19 studies, mortality and respiratory support during hospitalisation have been used as hard endpoints; however, in this study, the authors have shifted the attention and instead use multi-organ complications during hospitalisation as the main endpoint. Furthermore, despite the mean age of this cohort being 71·1 years (SD 18·7), they also focused on younger patients in whom the case fatality rate was low but might suffer more from post-acute COVID-19.

Previous studies have mainly focused on patients with COVID-19 who are most susceptible to complications, such as older people (aged ≥50 years) and those with more comorbidities. Drake and colleagues' findings about risk factors of complications are consistent with previous results. Their results show that the increasing risk of complications affecting a specific organ is positively associated with pre-existing comorbidities of the same organ, age, and gender for nearly all types of complications, except for gastrointestinal and liver complications. Further assessment of the association of complications with survival status and critical care shows both numbers and types of complications matter, with more complications associated with worse survival status (log-rank p<0·001), and complex respiratory (hazard ratio 2·15, 95% CI 2·04–2·27) and cardiovascular (1·98, 1·85–2·11) complications showing the strongest association with survival status.

Nevertheless, the relative effect of complications on survival status and quality of life among people of different age groups was not previously understood. One of the most notable findings in this study is that the relative risk of death is much higher in younger patients with complications when compared with those of the same age who did not suffer a complication, whereas in older patients, the relative impact of complications on mortality appears to be lower. Whether this difference in complications on mortality was statistically significant was not examined by the authors. This finding is independent of the presence and number of comorbidities and indicates that attention should also be paid to younger patients who are less likely to die during the acute phase but more likely to live longer with complications in the days after acute or subacute COVID-19.

By dissecting the effect of multi-organ complications of COVID-19 from different angles including age, gender, and comorbidity, the study provides inspiring ideas for long-term cohort studies by balancing attention between younger and older patients. However, several questions need to be answered in future studies. First, this study only focused on in-hospital complications and its effect on survival status and ability of self-care at discharge. Therefore, the effect of complications on long-term consequences need to be assessed. Second, socioeconomics, race, and ethnicity are important considerations for long COVID-19. The authors described the proportions of complications among patients with different ethnicities and included deprivation as a confounding factor without further comprehensive evaluation. It would be interesting and informative to examine the data regarding socioeconomics and ethnicity as the authors have done for age, gender, and comorbidity. Finally, although the model construction was robust, residual confounding effects cannot be excluded. Some factors such as the sequential organ failure assessment score and D-dimer on admission, and the use of dexamethasone that were shown to be related to in-hospital mortality were not adjusted.[6,7]

The public health effect of post-acute COVID-19 is substantial considering the large number of people infected by SARS-CoV-2 globally.[8] In addition to delineating the diverse manifestation across the full clinical spectrum of post-acute COVID-19, the pathophysiological mechanisms attributable to post-acute COVID-19, especially long COVID-19, need to be further elucidated among people with different demographic and clinical characteristics.[9] Furthermore, research on the effects of the serological features, together with immunological aberrations and inflammatory damage resulting from acute SARS-CoV-2 infection, on post-acute or long COVID-19 is needed.

We declare no competing interests.

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BMI and diabetes risk in low-income and middle-income countries

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Diabetes is a growing public health problem in all countries, but this increase has been much faster in low-income and middle-income countries (LMICs)[1,2] than in high income countries (HICs)[3] over the past three decades.[4] Concomitantly, the paucity of robust and representative data has prevented improved characterisation of the risk factors underlying this sharp increase in the burden in LMICs, which is needed to build more efficient diabetes screening and prevention policies than the current standard. Reliance on diabetes screening and diagnostic criteria based largely on data from HICs[5,6] has therefore substituted for these deficiencies, and tailoring diabetes screening strategies to cutoffs of measurable risk factors derived from data from representative cohorts in LMICs has been a long-term challenge.

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The increase in adiposity and subsequent elevation in body-mass index (BMI) is an important driver of the aforementioned global burden of diabetes,[7] and the pathophysiological link between obesity and diabetes has been well described.[8] Therefore, leveraging BMI, which is an easily measurable and inexpensive parameter, in resource-constrained settings to guide screening for diabetes could prove especially beneficial. Implementation of such a strategy would therefore require accurate analysis of the association between BMI and the risk of diabetes, drawn from nationally representative samples, as has been done in populations in HICs.[3] The need for ethnicity-specific or region-specific diabetes screening and prevention strategies was previously highlighted after south Asian, Chinese, and African individuals were found to develop diabetes at a higher rate, an earlier age, and a lower BMI than White individuals, but these differences were observed in non-representative population samples.[9]

In *The Lancet*, Felix Teufel and colleagues[10] report on the association between BMI and diabetes