Obesity

COVID-19 and Obesity: The Intersection Between a Pandemic and an Epidemic in a Developing Country

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TO THE EDITOR: We have read with great interest the prospective cohort study published by Czernichow et al (1), wherein they found that obesity doubles mortality in patients hospitalized with coronavirus disease (COVID-19), using BMI as an anthropometric indicator. Despite BMI being recognized as an anthropometric index of obesity and various studies confirming that it predicts cardiovascular events, the lack of information it provides on the distribution of body fat is considered its main limitation. Abdominal circumference and waist-height ratio are better measures of visceral fat distribution, which is more closely associated with cardiometabolic risk (2); however, those measures demand greater contact with patients with COVID-19.

Excess mortality and severity of the COVID-19 disease in people with obesity are also prevalent in developing countries with constrained resources such as Peru, in which preliminary findings reported by the Ministry of Health show that among people with obesity who have died from COVID-19, 85.5% had obesity as assessed by BMI. Excess weight continues to be a major public health problem in our country. At present, 22.7% of Peruvians have obesity, representing an increase of 1.7% compared with data from 2017. Moreover, obesity is more prevalent in Peruvian women (26%) than in Peruvian men (19.3%). The population of individuals with excess weight, including overweight and obesity, reached 60%, a value that has increased by 2.1% compared with data from 2017 (3). These two conditions are strongly associated with prediabetes and diabetes, which exhibit a prevalence of 22.4% and 7%, respectively, in the Peruvian population (4).

There are multiple mechanisms that might explain why people with obesity have more mortality and a severe course of COVID-19 infection (1). Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) penetrates human cells through direct binding with angiotensin-converting enzyme 2 (ACE2) receptors on the cell surface. The ACE2 expression in adipose tissue is higher than that in the lung, a major target organ affected by COVID-19. The population with obesity has more adipose tissue, and adipose tissue might serve as a viral reservoir. Furthermore, obesity is associated with a state of chronic low-grade inflammation and increased levels of circulating proinflammatory cytokines, such as leptin, tumor necrosis factor α, and interleukin 6, which may impair immune response and affect the lung parenchyma, thus contributing to increased morbidity associated with obesity in COVID-19 infection (5,6). Additionally, obesity is associated with insulin resistance, overactivity of the renin angiotensin–aldosterone system, impaired pulmonary function, and hypercoagulability, which are associated with worse outcomes in COVID-19 infection (1,6).

To date, despite recognition of the many conditions associated with obesity, Peru has not developed an effective public health program for the prevention and control of obesity. Additionally, obesity is not considered a chronic disease and thus does not have insurance coverage (7). As studies have highlighted the association between this disease and the mortality and severity of SARS-CoV-2 infection, Peru and other countries are recognizing the importance of considering obesity as a disease and developing effective health system strategies and public health approaches.

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References

1. Czernichow S, Beeker N, Rives-Lange C, et al. Obesity doubles mortality in patients hospitalized for SARS-CoV-2 in Paris hospitals, France: a cohort study on 5,795 patients. *Obesity (Silver Spring)* 2020;28:2282-2289. doi:10.1002/oby.23014
2. Zhang Y, Gu Y, Wang N, et al. Association between anthropometric indicators of obesity and cardiovascular risk factors among adults in Shanghai, China. *BMC Public Health* 2019;19:1035. doi:10.1186/s12889-019-7366-0
3. Seclén S, Villena-Chávez J, Pinto-Valdivia M, et al. Prediabetes in Peru: consensus of experts. *Revista de la ALAD* 2020;10:66-79.
4. Seclen S, Rosas M, Arias A, Huayta E, Medina C. Prevalence of diabetes and impaired fasting glucose in Peru: report from PERUDIAB, a national urban population-based longitudinal study. *BMJ Open Diabetes Res Care* 2015;3:e000110. doi:10.1136/bmjdrc-2015-000110.
5. Seidu S, Gillies C, Zaccardi F, et al. The impact of obesity on severe disease and mortality in people with SARS-CoV-2: a systematic review and meta-analysis. *Endocrinol Diabetes Metab* 2020;00:e00176. doi:10.1002/edm2.176
6. Sanchis-Gomar F, Lavie CJ, Mehra MR, Henry BM, Lippi G. Obesity and outcomes in COVID-19: when an epidemic and pandemic collide. *Mayo Clin Proc* 2020;95:1445-1453.
7. Lanata C. Overweight and obesity in Peru: urgent need to have a public health policy for their control. *Rev Peru Med Exp Salud Publica* 2012;29:299-300.

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