Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Letter to Editors

Should an intersection between visceral leishmaniasis endemicity and the COVID-19 pandemic be considered?

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ABSTRACT

The COVID-19 pandemic caused by the infection with the novel Coronavirus SARS-CoV-2, revealed individual and global vulnerabilities, in which we highlight the social, economic, and political aspects and the health systems' organization in the countries. Brazil remains with a high transmission rate and presents a centripetal distribution as observed through a more sustained growth in the number of municipalities affected, outlining a profile of invasion of poor communities. Several vulnerabilities overlap with precarious housing conditions, lack of basic sanitation, malnutrition, and endemicity for neglected chronic diseases such as visceral leishmaniasis (VL). COVID-19 and VL evidently do not share clinical features, but exactly because of the distinct immunopathogenesis between the diseases, patients with VL may present a vulnerability in the immune system against antiviral responses. Considering that VL susceptibility seems to be related to an inefficient and polarized immune response, it is likely that in endemic areas, the overlap of social weaknesses added to individual vulnerability by immune polarization may aggravate the COVID-19 condition. In this sense, we reinforce that possible relationships between endemic neglected diseases such as VL and pandemic SARS-CoV-2 infection need to be further considered and investigated.

Dear editor,

The COVID-19 pandemic caused by the infection with the novel Coronavirus SARS-CoV-2 [1], revealed individual and global vulnerabilities, in which we highlight the social, economic, and political aspects and the health systems' organization in the countries. With the advancement of the disease and accumulation of epidemiological data, the world organizations prepared a list of risk groups for COVID-19, including elderly, hypertensive, diabetic, obese, individuals with cardiovascular problems, and more recently these groups were expanded to include pregnant women, asthmatics, conditions that affect their immune system, among others [2].

In countries that still remain with a high transmission rate, COVID-19 presents a centripetal distribution as observed in Brazil through a more sustained growth in the number of municipalities affected, outlining a profile of invasion of poor communities [3,4]. Several vulnerabilities overlap with precarious housing conditions lack, of basic sanitation, malnutrition, and endemicity for neglected chronic diseases such as visceral leishmaniasis (VL). In 2018, VL lethality in the Americas reached 8%, and among the total of notified cases, 97% (3,466) were reported by Brazil [5]. Interestingly, in the scientific literature on this issue, VL versus COVID-19 is still quite limited, but recently Miotti and co-authors published a first case of COVID-19 in a patient with VL in Italy. In this patient, immunosuppression caused by VL seems to have contributed to the worsening of the clinical course [6]. Despite the well-described report, correlation factors between diseases are not listed.

COVID-19 caused by the novel Coronavirus and the VL induced following infection with protozoan *Leishmania (Leishmania) infantum*, evidently do not share clinical features, but exactly because of the distinct immunopathogenesis between the diseases, patients with VL may present a vulnerability in the immune system against antiviral responses. Protozoan persistence seems to be very frequent in infected individuals, and the development of an immunocompromise, and in some cases an immunosuppressive state, impacts various activities of innate and adaptive immunity [7] in patients with VL as evidenced by the inability of IFN-γ production by peripheral blood mononuclear cells stimulated with leishmanial antigens [8].

Regarding COVID-19, studies point out that a resolutive anti-viral immune response is associated with an effective inflammation related to IFNs production, activation of cellular immunity by CD8 T lymphocytes and NK cells, and counterbalanced by a modulated anti-inflammatory response [9]. Considering that VL susceptibility seems to be related to an inefficient and polarized immune response, it is likely that in endemic areas, the overlap of social weaknesses added to individual vulnerability by immune polarization may aggravate the COVID-19 condition (Fig. 1), contributing to maintenance of sustained high levels of the number of cases, or even by an unfavorable impact on the outcome, leading to mortality.

The COVID-19 pandemic has revealed many vulnerability relational aspects in the individual and collective domain. In this sense, we reinforce that possible relationships between endemic neglected diseases such as VL and pandemic SARS-CoV-2 infection need to be further considered and investigated.

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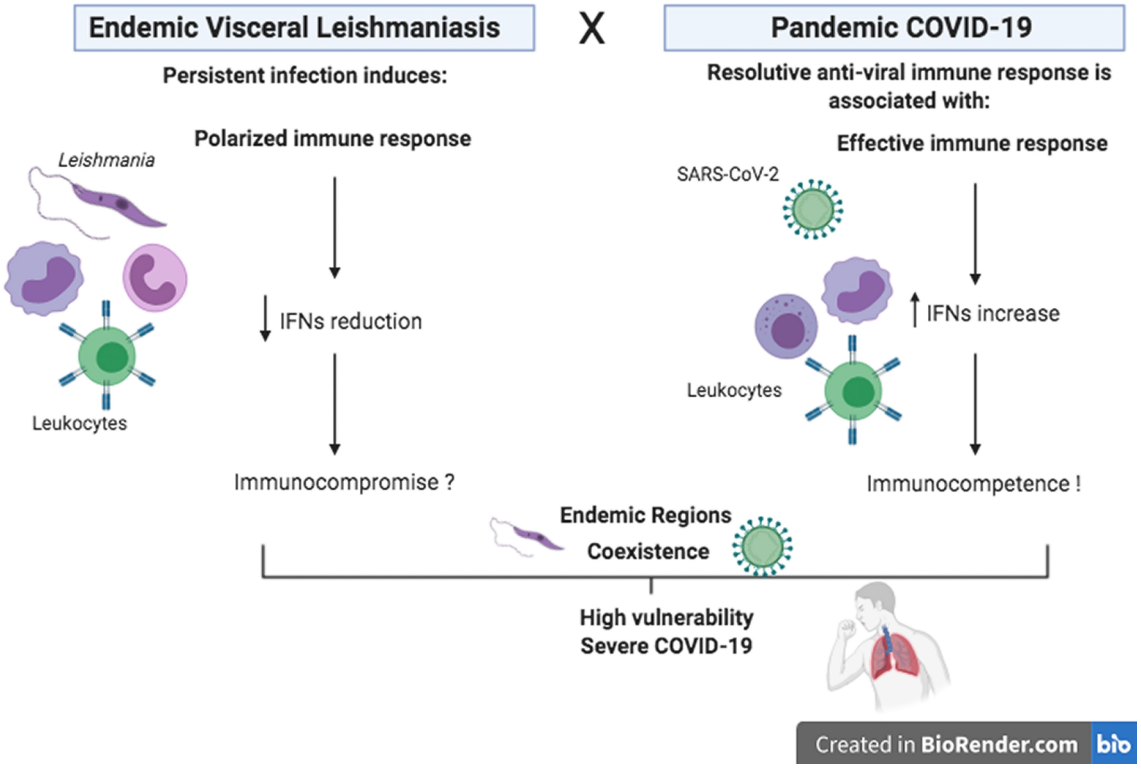

Fig. 1. A brief scheme of the immunological intersection between endemic VL and pandemic COVID-19.

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Authors' contributions

S.F.G. Carvalho and M.C. Andrade contributed to conception, design, data acquisition, and interpretation, and drafted and critically revised the manuscript. T.M. Vieira and A.P.V. Moura contributed to interpretation and critically revised the manuscript. All authors gave their final approval and agree to be accountable for all aspects of the work.

Declaration of Competing Interest

The author declares no competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Sílvio Fernando Guimarães Carvalho, Thallyta Maria Vieira, Ana Paula Venuto Moura, Marileia Chaves Andrade*
Universidade Estadual de Montes Claros, UNIMONTES, Montes Claros, Minas Gerais, Brazil
Centro de Pesquisas em Doenças Infecciosas e Parasitárias, Brazil
E-mail address: marileia.andrade@unimontes.br (M.C. Andrade).

* Corresponding author at: Lab. Epidemiologia e Biocontrole de Microrganismos, Cx postal 126, Montes Claros, MG, Brazil.