

LETTER

Open Access



# *Candida* infections in severe acute pancreatitis: we need to do more in order to distinguish invasive infection from simple colonization

Patrick M. Honore\*, Aude Mugisha, Luc Kugener, Sebastien Redant, Rachid Attou, Andrea Gallerani and David De Bels

We read with great interest the recent paper regarding anti-infective therapy for severe acute pancreatitis (SAP) by Montravers et al., who conclude regarding fungal infections that most of their cases received azoles in the context of both documented and empirical antifungal therapies [1]. We would like to make some comments. *Candida* is present in huge quantity in the colon. An increase over the years in *Candida* infection in non-neutropenic critically ill patients has been demonstrated to put them at increased risk of mortality and morbidity [2]. While there is a concern that this is the case in patients with SAP [3], this has not been universally demonstrated [4]. It is, however, likely that colonization plays an important instigating role in these invasive infections [4]. Patients with SAP are at a particular risk of invasive *Candida* infections. In a study by Hall and colleagues, both colonization with *Candida* spp. and a *Candida* colonization index score (CCIS) > 0.5 were associated with subsequent infection [4]. The CCIS was calculated for each patient as follows: CCIS = ratio of the number of non-blood distinct body sites colonized with *Candida* spp. to the total number of body sites cultured [4]. A CCIS  $\geq$  0.5 predicts *Candida* infection; therefore, patients who had invasive *Candida* infections and a CCIS  $\geq$  0.5 were defined as true positives [4]. In their commentary regarding the Hall paper, Montravers et al. themselves concluded that the mistakes of previous decades in the field of bacterial infection should not be

repeated; a step-by-step approach is required [5]. Additional scientifically rigorous studies with accurate descriptions of cases similar to those in the article by Hall et al. [4] are required before prophylaxis or extensive therapeutic indications of antifungal agents in SAP can be proposed [5]. In conclusion, we believe that the cohort study of Montravers et al. should have discussed in more detail the importance of distinguishing between invasive *Candida* infections and colonization, noting, for instance, the utility of scoring systems such as the CCIS score in preventing unnecessary treatment for *Candida* colonization.

#### Abbreviations

SAP: Severe acute pancreatitis; CCIS: *Candida* colonization index score

#### Acknowledgements

We would like to thank Dr. Melissa Jackson for the critical review of the manuscript.

#### Authors' contributions

PMH, SR, and DDB designed the paper. All authors participated in drafting and reviewing the manuscript. All authors read and approved the final version of the manuscript.

#### Funding

None.

#### Availability of data and materials

Not applicable.

#### Ethics approval and consent to participate

Not applicable.

\* Correspondence: [Patrick.Honore@CHU-Brugmann.be](mailto:Patrick.Honore@CHU-Brugmann.be)

ICU Department, Centre Hospitalier Universitaire Brugmann-Brugmann University Hospital, Place Van Gehuchtenplein, 4, 1020 Brussels, Belgium



© The Author(s). 2020 **Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>. The Creative Commons Public Domain Dedication waiver (<http://creativecommons.org/publicdomain/zero/1.0/>) applies to the data made available in this article, unless otherwise stated in a credit line to the data.

**Consent for publication**

Not applicable.

**Competing interests**

The authors declare to have no competing interests.

Received: 14 March 2020 Accepted: 6 April 2020

Published online: 16 April 2020

**References**

1. Montravers P, Kantor E, Constantin JM, Lefrant JY, Lescot T, Nesseler N, Paugam C, Jabaudon M, Dupont H. Epidemiology and prognosis of anti-infective therapy in the ICU setting during acute pancreatitis: a cohort study. *Crit Care*. 2019;23(1):393. <https://doi.org/10.1186/s13054-019-2681-5>.
2. Leon C, Ruiz-Santana S, Saavedra P, Almirante B, Nolla-Salas J, Alvarez-Lerma F, Garnacho-Montero J, Leon MA: A bedside scoring system ("Candida score") for early antifungal treatment in nonneutropenic critically ill patients with *Candida* colonization. *Crit Care Med* 2006;34:730–737.
3. Hoerauf A, Hammer S, Muller-Myhsok B, Rupperecht H. Intra-abdominal *Candida* infection during acute necrotizing pancreatitis has a high prevalence and is associated with increased mortality. *Crit Care Med*. 1998; 26:2010–5.
4. Hall AM, Poole LA, Renton B, Wozniak A, Fisher M, Neal T, Halloran CM, Cox T, Hampshire PA. Prediction of invasive candidal infection in critically ill patients with severe acute pancreatitis. *Crit Care*. 2013;17(2):R49. <https://doi.org/10.1186/cc12569>.
5. Montravers P, Boudinet S, Houissa H. *Candida* and severe acute pancreatitis: we won't be fooled again. *Crit Care*. 2013;17(3):137. <https://doi.org/10.1186/cc12613>.

**Publisher's Note**

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.