Early View

Correspondence

To code or not to code chronic pulmonary aspergillosis associated malnutrition in PMSI database: that is the problem…

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To code or not to code chronic pulmonary aspergillosis associated malnutrition in PMSI database: that is the problem…

Reply to Jouneau *et al.*

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From the authors:

We read with interest the letter from Jouneau *et al.* untitled "*To be malnourished or not to be malnourished: that is the question!*", referencing our study in which we overviewed the epidemiology and prognostic of chronic pulmonary aspergillosis (CPA) in France [1]. Based on the French nationwide administrative hospital database (PMSI), which is designed to include discharge abstracts for all inpatients admitted to public and private hospitals in France, we reported that malnutrition is one of the most frequent CPA underlying conditions concerning 38 to 44% of CPA patients from 2014 to 2018. Moreover, in CPA incident cases, malnutrition increased significantly in-hospital mortality at their first hospitalization but also at 1 and 5 years, in multivariate analyses.

Jouneau *et al.* highlighted the risk of malnutrition rates underestimation using PMSI database. We agree malnutrition rate we reported in CPA patients, is lower than the one suggested by BMI data shown in previous retrospective (BMI=20.8 kg/m^2) and prospective (BMI=17.3 kg/m^2) studies performed in France [2, 3]. However, all CPA patients in these studies received an antifungal treatment while it is not the case for those in the PMSI cohort. Contrary to the Jouneau *et al.* assertion, speculated malnutrition diagnosis was not limited to BMI below 21 kg/m^2 as PMSI coding follows rules from French Hospital Methodological Guidelines. The malnutrition diagnosis we used was composite including one criteria observed among: weight loss compared to a value in a previous medical record, BMI less than or equal to 17 or 21 kg/m² (according to patient's age), or low albuminemia and prealbuminemia plasmatic concentrations. This guideline of course did not prevent coding bias, and risk of underestimation. Nonetheless we assume that the risk of underestimation is lowered during the study period (2009-2018) particularly since 2016 when hospital fee schedule was revised, introducing an impact of malnutrition codes in hospital tariff. This assumption is supported by the malnutrition rate we reported in the 5 years preceding the CPA diagnosis during the period 2014 to 2018. It was around 38% before 2016 and significantly increased to around 45% after 2016 (p<0.01). To go further we have renewed the survival analysis according to the severity of malnutrition (moderate = ICD-10 codes

E440; severe = ICD-10 codes from E40 to E43) in CPA incident cases hospitalized from 2013 to 2017. Multivariate-pooled analysis revealed graduate risk of in-hospital mortality from 1.8 ([1.3-2.5] p<0.01) to 3.3 ([2.5-4.3] p<0.01) according to malnutrition severity (Figure 1).

The risk of underestimation is a usual limit of epidemiological studies based on medico-administrative data [5, 6]. Nonetheless, concerning the French PMSI database, the quality and completeness of the coding of procedures are evaluated locally by the hospital medical information departments and at the national level by the paying organization. Finally, these national data are used for hospitals' budget allocation, which may improve data quality in terms of coherence, accuracy and exhaustiveness. To limit the risk of overcoding, the French health insurance regularly checks coding accuracy on the basis of samples of discharge abstracts, and hospitals can be fined in case of excessive errors.

The high prevalence of malnutrition in CPA patients is related to CPA, or to underlying diseases. As Jouneau *et al.* recalled, systematic and integrative screening of malnutrition is a crucial issue in patient with chronic lung diseases [7]. In CPA patient this screening have additional benefit to identify patients with poorer prognosis, *i.e.* those needing specific CPA treatment [4]. Nutritional care should be systematic in CPA patient with malnutrition, even if the benefit of nutritional care in CPA survival was not assessed yet.

Conflict of interest:

T. Maitre has nothing to disclose.

J. Cottenet has nothing to disclose.

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A. Roussot has nothing to disclose.

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V. Ok has nothing to disclose.

A. Parrot has nothing to disclose.

P. Bonniaud has nothing to disclose.

C. Quantin has nothing to disclose.

J. Cadranel has nothing to disclose.

Reference

1.   Maitre T, Cottenet J, Godet C, Roussot A, Abdoul Carime N, Ok V, Parrot A, Bonniaud P, Quantin C, Cadranel J. Chronic pulmonary aspergillosis: prevalence, favouring pulmonary diseases and prognosis. *Eur Respir J* 2021; 58: 2003345.

2.   Godet C, Laurent F, Bergeron A, Ingrand P, Beigelman-Aubry C, Camara B, Cottin V, Germaud P, Philippe B, Pison C, Toper C, Carette MF, Frat J-P, Béraud G, Roblot F, Cadranel J, ACHROSCAN Study Group. CT Imaging Assessment of Response to Treatment in Chronic Pulmonary Aspergillosis. *Chest* 2016; 150: 139–147.

3.   Cadranel J, Philippe B, Hennequin C, Bergeron A, Bergot E, Bourdin A, Cottin V, Jeanfaivre T, Godet C, Pineau M, Germaud P. Voriconazole for chronic pulmonary aspergillosis: a prospective multicenter trial. *Eur. J. Clin. Microbiol. Infect. Dis.* 2012; 31: 3231–3239.

4.   Denning DW, Cadranel J, Beigelman-Aubry C, Ader F, Chakrabarti A, Blot S, Ullmann AJ, Dimopoulos G, Lange C, European Society for Clinical Microbiology and Infectious Diseases and European Respiratory Society. Chronic pulmonary aspergillosis: rationale and clinical guidelines for diagnosis and management. *Eur. Respir. J.* 2016; 47: 45–68.

5.   Maitre T, Cottenet J, Beltramo G, Georges M, Blot M, Piroth L, Bonniaud P, Quantin C. Increasing burden of noninfectious lung disease in persons living with HIV: a 7-year study using the French nationwide hospital administrative database. *Eur. Respir. J.* 2018; 52.

6.   Beltramo G, Cottenet J, Mariet A-S, Georges M, Piroth L, Tubert-Bitter P, Bonniaud P, Quantin C. Chronic respiratory diseases are predictors of severe outcome in COVID-19 hospitalised patients: a nationwide study. *Eur Respir J* 2021; : 2004474.

7.   Jouneau S, Lederlin M, Vernhet L, Thibault R. Malnutrition in idiopathic pulmonary fibrosis: the great forgotten comorbidity! *Eur Respir J* 2019; 53: 1900418.
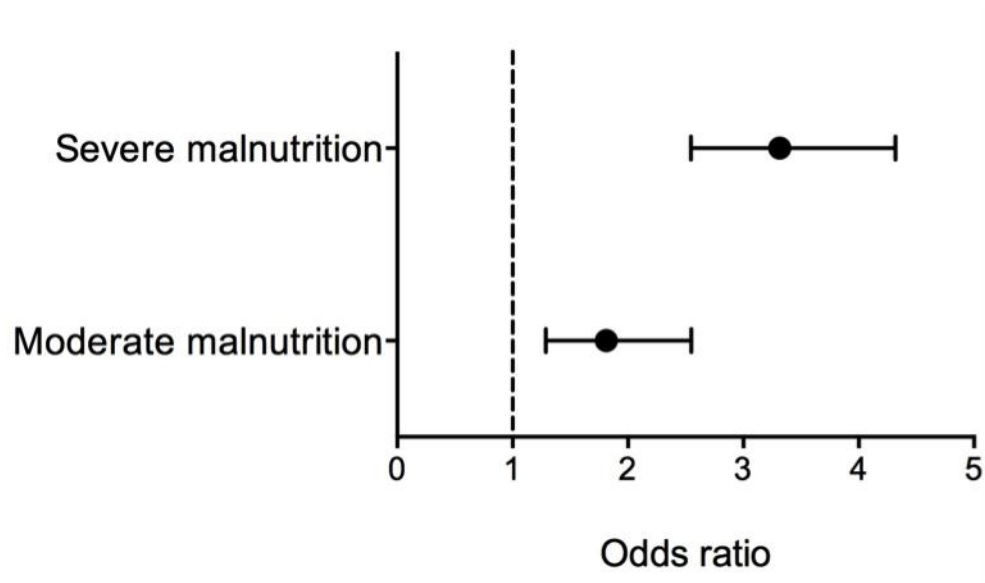
Multivariate pooled analysis of mortality at the first hospitalization over 5 consecutive years in a cohort of CPA patients hospitalized from 2013 to 2017, according to malnutrition severity.