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Outcome and treatment of nocardiosis after solid organ transplantation: new insights from a European study

David Lebeaux*¹, Romain Freund², Christian Van Delden³, H el ene Guillot⁴, Sierk D. Marbus⁵, Matignon Marie⁶, Eric Van Wijngaerden⁷, Benoit Douvry⁸, Julien De Greef⁹, Fanny Vuotto¹⁰, Le ila Tricot¹¹, Mario Fernandez Ruiz¹², Jacques Dantal¹³, C edric Hirzel¹⁴, Jean-Philippe Jais², Veronica Rodriguez-Nava¹⁵, Fr ed erique Jacobs¹⁶, Olivier Lortholary¹⁷, Julien Coussement¹⁸

¹*H opital Necker-Enfants Malades; Infectious Diseases*

²*Universit  Paris Descartes, Inserm Umrs 1138 Team 22 and Aphp, H opital Necker Enfants Malades, Biostatistics Unit*

³*Geneva University Hospitals; Department of Medical Specialties; Division of Infectious Diseases*

⁴*Aphp, H opitaux Universitaires Piti  Salp tri re-Charles Foix; Service des Maladies Infectieuses et Tropicales*

⁵*Department of Infectious Diseases, Leiden University Medical Center*

⁶*Service de N phrologie, Chu Henri Mondor, Ap-Hp*

⁷*Department of General Internal Medicine, University Hospitals Leuven*

⁸*Service de Pneumologie et de Transplantation Pulmonaire, H opital Foch*

⁹*Department of Internal Medicine and Infectious Diseases, Saint-Luc University Hospital, Universit  Catholique de Louvain*

¹⁰*Infectious Diseases Unit, Huriez Hospital, Chru Lille*

¹¹*Service de N phrologie - Transplantation R nale, H opital Foch*

¹²*12 de Octubre University Hospital, Instituto de Investigaci n Hospital "12 de Octubre" (I+12); Unit of Infectious Diseases*

¹³*Itun (Institut de Transplantation, D'urologie et de Néphrologie), Chu Nantes*

¹⁴*Department of Infectious Diseases, Bern University Hospital, University of Bern*

¹⁵*Research Group on Bacterial Opportunistic Pathogens and Environment Umr5557 Écologie Microbienne, French Observatory of Nocardiosis, Université de Lyon 1, Cnrs, Vetagro Sup*

¹⁶*Université Libre de Bruxelles; Cub-Erasme Hospital; Infectious Diseases*

¹⁷*Institut Pasteur*

¹⁸*Department of Infectious Diseases, Cub-Hôpital Erasme, Université Libre de Bruxelles*

Background: Solid organ transplant (SOT) recipients are at risk of nocardiosis, a rare opportunistic bacterial infection. Our objectives were to identify factors associated with one-year mortality after nocardiosis in this population, and describe the outcome of patients receiving a short-course of antibiotics (≤ 120 days).

Material/methods: We analyzed data from a retrospective multicenter European case-control study that included 117 SOT recipients with nocardiosis diagnosed between 2000 and 2014. Multivariable conditional logistic regression analysis was performed to determine factors associated with one-year all-cause mortality.

Results: One-year mortality was ten-fold higher in patients with nocardiosis (16.2%, 19/117) than in control transplant recipients (1.3%, 3/233, $p < 0.001$). Death occurred after a median of 134 [4-359] days post-infection.

In multivariable analysis, a recent history of tumor (odds ratio [OR] 1.4; 95% confidence interval [CI] 1.1-1.8), invasive fungal infection in the six months before nocardiosis (OR 1.3; 95% CI 1.1-1.5) and donor age (OR 1.0046; 95% CI 1.0007-1.0083) were independently associated with mortality. Acute rejection in the year before nocardiosis was associated with improved survival (OR 0.85; 95% CI 0.73-0.98).

During the first two weeks of treatment, appropriate antibiotics were prescribed in 94.6% of the patients (105/111) based on results of antibiotic susceptibility testing. Bactericidal antibiotics (amikacin, carbapenems, third-generation cephalosporin restricted to ceftriaxone or cefotaxime) were used as initial therapy in 66/109 of the patients (60.6%) and two simultaneous appropriate antibiotics were prescribed in 48/111 of the patients (43.2%).

A total of seven patients (7/117, 6.0%) had a relapse during follow-up. These patients received a median duration of treatment of 165 [51-501] days with one patient receiving short-course treatment (51 days).

Seventeen patients received a short-course of antibiotics (median duration 56 [24-120] days) with a success (cured and surviving at one year) rate of 88% and a 5.9% risk of relapse after a median follow-up of 49 [6-136] months. Compared with the entire cohort, the 17 patients in whom antibiotics

were voluntarily given for ≤ 120 days were less likely to have disseminated disease (2/17 [11.8%] vs. 50/117 [42.7%], $p < 0.01$) and tended to have less frequently a CNS (1/17 [5.9%] vs. 30/117 [25.6%], $p = 0.12$) infection.

Conclusions: Nocardiosis was associated with a ten-fold higher mortality rate, as compared to control transplant recipients. Four factors were independently associated with 1-year mortality in post-transplantation nocardiosis, largely reflecting the general medical condition rather than the severity and/or management of nocardiosis. Patients receiving short-course (≤ 120 days) antibiotic treatment had good outcomes, suggesting this may be a safe strategy in patients with uncomplicated nocardiosis, especially without brain involvement.