



Editorial

The Delphi method applied to fungal infection: There is still some way to go



El método Delphi aplicado a la infección por hongos: todavía hay mucho camino por recorrer

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The Delphi method, coined by philosopher Abraham Kaplan of the USA-based Rand Corporation, gets its name from the Greek city Delphi, home of the temple of Apollo, where one would go to get Pythia's prophetic predictions.¹⁶ Despite the initial criticisms of the method, it was later demonstrated that the results of a consensus from an expert working group was superior to that obtained from other experts on an individual basis. The first experiment based on the Delphi method dates back to 1948 where it predicted the outcome of horse races.²⁰ A few years later, in 1951, this method was used in the USA for military purposes, namely to make a prediction on the future of the US weapons arsenal.⁹ Subsequently, the Delphi method proved useful in those situations where scientific evidence was limited, and in which the collection of information from an expert consensus group proved to support some specific scientific point. It has also had application in areas of health, education and administration.⁴ Prior to the start of a Delphi project, a coordination group and a group of experts (all available throughout the entire process) is set in place. The group is selected upon their ability to establish guidelines for the anticipated work on a particular topic, and their knowledge of the subject matter to be discussed. As the groups' lack of individual participation could constitute a drawback to the Delphi method, the members are sent anonymous surveys, received either by mail or electronically, thereby preserving their input from the potential distortion that group meetings may cause.¹³ The Delphi method combines personal opinions from experienced experts together with aids to decision-making that would be hardly feasible for an isolated researcher. For this reason, the Delphi method has been a technique that can achieve agreed upon views on a particular subject within a particular group. The analysis of the responses to the initial issues raised in the first survey generates a second survey to the same participating experts. In fact, the Delphi method consists of four phases.²⁰ The first aim is at exploring the topic under

discussion. Each expert provides information considered essential. The coordinating group then integrates the answers and generates the second questionnaire. The next phase in the process includes reaching an understanding of the topic under discussion and analyzing agreements and disagreements that have been set forth throughout the questionnaire process. A third questionnaire follows. This third phase consists of the coordinating group receiving the questionnaires from the experts, the analyzing the responses, exploring the reasons for the differences, and providing an assessment. The fourth phase consists of submitting a final report with quantitative data. The time elapsed between the different rounds in a segmented study based on the Delphi method must be as short as possible.¹⁰ When short, it promotes and maintains the interest of the participating experts, whereas when it is prolonged, the facts to be analyzed may vary and, consequently, also the experts' assessments. Avoiding the problems that arise from face to face meetings, where an opinion leader might condition the opinion of the other attendants, is another major advantage of the Delphi method.¹⁷ Another advantage is the reduction of costs associated with face-to-face meetings that can be substantial when the expert groups are numerous. The anonymity of the survey respondents is another major advantage of this system. As major drawbacks, the need to invest much time to complete the documents,²⁰ the imposition of preconceived ideas about the experts and, in some cases, the lack of synthesis of the message that is intended by the coordinating group and the absence of the reflection necessary for addressing disagreements have been described. The design must keep a balance between the open-ended questions and more structured ones, as this is an important aspect to improving the process. Despite these drawbacks, the Delphi model provides the necessary flexibility to reach an agreement on areas of uncertainty or limited scientific evidence.

In the area of fungal infections, despite the passing years and the emergence of new antifungal molecules, there are still some limitations related to the knowledge of prevention, diagnosis and treatment of invasive candidiasis.¹⁵ The clinical manifestations of invasive fungal infections are not specific and precise tools to

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improve the level of suspicion for applying the most appropriate treatment at an early stage.² There is a need to develop new diagnostic tests that are rapid and have a high sensitivity and specificity, since those currently available do not meet these conditions.³ The combination of some of these tests based on antigens and antibody determination does, however, have a high negative predictive value and could improve optimization programs for the use of antifungal drugs.¹² We must add to the aforementioned that despite the view that echinocandins are promising and that they hold a preeminent position in various treatment guidelines of fungal infections, treatment outcomes in patients with candidemia are still not those expected, maintaining a high mortality rate.⁶ Additionally, the different risk scores of invasive candidiasis developed so far have shown a high negative predictive value but poor positive predictive value.¹ While the early institution of antifungal therapy may be beneficial in non-neutropenic, critically ill patients, it imposes unnecessary exposure to antifungal drugs with the consequent impact in increased resistance to these drugs and costs.¹⁸ This situation is common to other processes such as the treatment of fungal infection in patients with allogeneic transplants or addressing antimicrobial therapy of sepsis. In both cases, not free from uncertainties, consensus documents based on the selection of a panel of experts who have suggested a series of recommendations based on the Delphi method have been developed.^{8,19}

In 2013, the first results of the EPICO study, also based on the Delphi method, which aimed to identify the knowledge and reach the largest number of agreements addressing critical adult patients with invasive candidiasis, were published.⁵ Twenty-five national experts in invasive fungal infections from five scientific societies involving intensivists, anesthesiologists, microbiologists, pharmacists and infectious disease specialists participated in this experience. The results from this survey formed a series of recommendations that were distributed to Spanish hospitals. A year later, the same group of coordinators proposed a new study with the purpose of developing a set of recommendations for the antifungal treatment of critically ill patients with invasive candidiasis in special situations and in different settings.²² The results from the 3.0 EPICO study utilizing the Delphi method are published in the current edition of this journal. The main clinical knowledge available and the recommendations necessary for addressing invasive fungal infection in surgical and postsurgical patients with long-stay in ICU,¹⁴ critically-ill hematology patients,¹¹ non-neutropenic patients⁷ and antifungal prophylaxis in solid organ transplant patients²¹ are published in the next pages. Thirty multidisciplinary experts, specialists in invasive fungal infections from six scientific societies, participated in the development of this project. Subsequently, a group meeting with more than 60 specialists who carried out the assessment and validation of the preselected recommendations and algorithms designed therein was convened. These documents represent an advance in positioning the approach of each of the patient groups described above. However, it requires the development of studies assessing the impact of the recommendations made and strengthen the evidence available in the management of patients with suspected or confirmed fungal infection.

In summary, the Delphi method is an additional method to improve the approach to patients suffering from invasive fungal infections. However, the results from these experiences should be validated by further studies with the aim of selecting those recommendations that demonstrate improved management for these patients.

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