



UPDATE IN INTENSIVE CARE: TRANSPLANTS

Solid organ transplant training objectives for residents[☆]

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KEYWORDS

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Medical resident;
Solid organ transplant

Abstract With the aim of analyzing the current state of the educational objectives in the training of medical residents in solid organ transplantation (SOT), we conducted a review of the status of the official programs of the specialities involved in SOT, focusing particularly on lung transplantation. A survey of medical residents was also conducted to allow consideration of the topic. We obtained 44 surveys from 4 University Hospitals with active programs in SOT, mainly from intensive care medicine and anesthesiology residents. We detected an important number of courses oriented to organ donation but very limited in terms of basic training in the management of the immediate postoperative period, principles of immunosuppression and updates on immunosuppressive therapy and complications (particularly rejection and infection). We also identified that these educational aspects should be directed not only to medical residents from specialities with a close relation to SOT, but also to all who may at some time have a relation to such patients. The use of information and communication techniques (ICTs), on-line courses and also simulations should be instrumental to take into account the biomedical training of medical residents. We conclude that we need a specific training program in complications of SOT, as well as fundamental principles in immunology and immunosuppressor pharmacology.

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PALABRAS CLAVE

Docencia;
Médico residente;
Trasplante órgano sólido

Objetivos docentes en la formación de médicos residentes en trasplante de órganos sólidos

Resumen Con el objetivo de analizar el estado actual de los objetivos docentes en la formación de médicos residentes en trasplantes de órganos sólidos (TOS), se efectuó una revisión del estado de los Programas Oficiales de las Especialidades implicadas en TOS, especialmente centrándonos en el trasplante pulmonar. También se efectuó una encuesta a médicos residentes a

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[◇] PLUTO Network members are listed in [Appendix](#) at the end of the text.

fin de poder obtener una visión que nos ayudara a las reflexiones sobre la materia. Obtuvimos 44 encuestas de 4 hospitales universitarios con programas activos en TOS, procedente fundamentalmente de médicos residentes de Medicina Intensiva y de Anestesiología. Se detectó que existe una buena oferta de cursos orientados a la donación de órganos pero muy escasa a nivel de la formación básica a nivel del manejo del postoperatorio inmediato, bases de la inmunosupresión y tratamiento inmunosupresor actualizado, así como de las complicaciones (particularmente, rechazo e infección). Asimismo, se identificó que, no solo deben formarse los facultativos de las especialidades directamente relacionadas con los pacientes TOS, sino también aquellos que en algún momento puedan encontrarse con un paciente de estas características, al menos de forma básica. La utilización de las técnicas de información y comunicación (TIC), cursos online y también la simulación, deberían ser instrumentos a tener en cuenta en la formación biomédica de médicos residentes. Concluimos que se necesita un programa específico de formación en complicaciones del TOS, así como de aspectos básicos de inmunología y farmacología de inmunosupresores.

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Introduction

«There is only one good: knowledge. Only one evil: ignorance»

Socrates (470–399 BC)

Different medical specialties are characterized by a direct relationship with solid organ transplant (SOT) patients, including Intensive Care Medicine, Anesthesiology, Nephrology, Urology, Gastrointestinal Diseases, General Surgery, Pneumology, Chest Surgery, Cardiology, Heart Surgery or Plastic Surgery. However, it is no exaggeration to say that any specialist may have contact with transplant patients, who after all are immune depressed individuals, and the range of disorders associated to the dichotomy transplant-immune depression is therefore wide indeed. For this reason, and as advised by the World Federation of Medical Education,¹ it is important for physicians in training to acquire a minimum body of knowledge that will depend on the specialty in each case, as well as with a series of well-defined objectives and competences in the different issues specific to resident in training programs.

In view of the above, we considered it interesting to dedicate a chapter to these training issues on occasion of the first meeting of the Forum on Lung Transplantation in Intensive Care, held in October 2011 in Santiago of Compostela (Spain). In effect, although there are many top level scientific events dedicated to scientific and patient care developments and advances, less attention is paid to the educational aspects involved—particularly those referred to the specialized training of residents.

As a first step, we reviewed the current state of the Official Programs of the Spanish National Commissions corresponding to some of the specialties most closely related to the lung transplant setting. Secondly, we aimed to assess the impressions of our current residents in training in this field. To this effect, a small survey was carried out in four major national centers with active SOT programs. Based on the data obtained, we attempted to draw a series of conclusions which were presented at the above mentioned Forum

as a stimulus for thought in developing and implementing measures designed to improve the training of residents in these settings.

With a view to setting our topic in context, it should be remembered that the first renal transplant in Spain was carried out in 1965, and the first liver transplant in 1984—the same year as the first heart transplant. However, it was not until 1990 that the first lung transplant was performed in Spain. The most recent versions of the official programs corresponding to some of the specialties implicated in SOT, particularly as refers to lung transplantation, date back to 1996 in the case of Anesthesiology, Intensive Care Medicine and Chest Surgery, while a 2008 update has been produced in the case of Pneumology. These programs can be consulted on the website of the Spanish Ministry of Health.²

The programs from 1996 have become outdated as a result of the advances in Medicine, particularly in the field of SOT. As objectives to be reached by the residents in training, these programs cite knowledge of brain death, its clinical and legal criteria; general knowledge referred to transplants and to legislation in this field; organ donor maintenance measures; and very general aspects referred to immune suppressors and the complications of these drugs. Few changes can be found in the 2008 update in Pneumology, which follows a very generic line. Nevertheless, some specialties have indeed made an effort to improve adaptation to training in SOT. This is the case of the Nephrology program, likewise revised in 2008, which now documents the need for knowledge in the immunology of renal transplantation and the bases of immunosuppressive treatment; organ obtainment and transplant coordination; maintenance of the kidney donor; management of the waiting list; management of the post-renal transplant period and of rejection and the long-term complications; knowledge of the results of the kidney transplant program; xenotransplants; live donor renal transplantation; and cardiovascular risk factors. In addition, the program contemplates a 5-month rotation period in a Renal Transplant Unit.

In the European Intensive Care setting, the COBATRICE (Competency-Based TRaining in Intensive Care medicine in

Europe) program, auspiced by the ESICM (European Society of Intensive Care Medicine), details a series of aspects referred to knowledge, skills and management attitudes following SOT, which during the training period should always fall under the supervision of an expert physician.³ In this context, the aim of the present study, presented on occasion of the first meeting of the Forum on Lung Transplantation in Intensive Care, was to analyze and reflect upon the current state of training in SOT.

Methods

Survey of residents in training

With the idea of obtaining an impression of how the residents of certain specialties implicated in SOT view their training in transplantation, we conducted an anonymous and voluntary survey of four university hospitals with active SOT programs (Bellvitge and Vall d'Hebron in Barcelona, Marqués de Valdecilla in Santander, and La Fe in Valencia). A questionnaire was delivered under the supervision of a physician in each hospital, with coordination from the Department of Intensive Care Medicine of Vall d'Hebron University Hospital (JRM). The data obtained were dedicated to a chapter on occasion of the Forum for discussion in Santiago de Compostela, held in October 2011, under the sponsorship of Astellas Pharma.

Six questions were asked: 1. During your residency period will you have the chance of contact with a transplant patient?; 2. Do you think your training program offers correct preparation for the management of SOT patients?; 3. Are the training objectives in this field clear to you?; 4. Can you cite some training objectives you know in this field?; 5. How do you rate your training in four concrete areas (management of the immediate postoperative period, management of immunosuppression, of rejection episodes, and of the infectious complications); and 6. What suggestions would you make to improve your training in this field? The first three questions involved a yes/no answer, while the rating requested in the fifth question was scored from 0 (no training) to 5 (excellent training).

Results

A total of 44 residents from the second year of the residency period onwards answered the questionnaire. Fifty-two percent were residents in Intensive Care Medicine, 39% in Anesthesiology, and 9% in other specialties.

Regarding the first question about the possibility of contact with an SOT patient (specifically, liver, kidney, lung or heart transplant patients), not all the residents answered affirmatively. In the case of renal transplantation, for example, 20% of the residents answered "no". In the case of the second question, 64% of the residents considered that they received correct training in the management of SOT patients. However, in reference to the third question, only 41% claimed to have a clear idea of the training objectives in this field. Tables 1 and 2 describe the main answers to

Table 1 Main training objectives cited by most residents referred to their training in solid organ transplantation (SOT).

Hemodynamic management of the immediate postoperative period
Immunosuppression. Management of special situations (renal failure, etc.)
Identification of potential donors
Other postoperative complications
Management of acute rejection
Management of infectious complications

questions 4 and 6 (what training objectives they could cite, and what proposals they could make for improving the training received), while Fig. 1 reports resident assessment of training in this area. No substantial differences were observed among the different years of the residency period or the specialties analyzed.

Discussion

To our knowledge, this is the first survey conducted in Spain on the training received by residents in aspects referred to postoperative management in SOT. The results point to the need to optimize such training, and to more precisely define the training objectives. Also of note is the proportion of patients who did not believe that they would have the possibility of contact with an SOT patient, despite the fact that their hospital center had an active transplantation program.

In the Forum on Lung Transplantation in Intensive Care, we observed a good offer of courses oriented toward organ donation and obtainment, donor management, and transplant coordination. However, clear shortcomings were noted regarding training in the management of the immediate postoperative period and middle term management in transplant patients. Specifically, a lack of training was identified in the immunology of SOT, in the principles of immunosuppressive treatment, and as regards the main immunosuppressor drugs currently in use. Likewise, shortcomings were observed in the management of the immediate postoperative period of transplantation, in the diagnosis and management of acute rejection, in the

Table 2 Main suggestions of the residents for improving their training in solid organ transplantation (SOT).

Clarification of the training objectives
Updating sessions, workshops and courses in this field
Availability of clinical protocols
Training focused on organ maintenance, rejection and infection
Witnessing of transplant surgery
Consideration of the healthcare burden in covering the training objectives

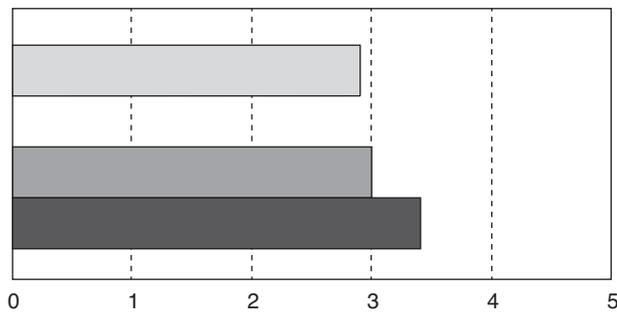


Figure 1 Resident assessment of different aspects referred to training in solid organ transplantation (SOT). Scoring was from 0 (no training) to 5 (excellent training). Management of immunosuppression (striped column); management of rejection episodes (white column); management of infectious complications (gray column); and management of the immediate postoperative period (squared column).

infectious complications found in this group of patients, and in the mechanical complications (in addition to vascular and airway complications in the concrete case of lung transplantation). The SEMICYUC (Spanish Society of Intensive and Critical Care Medicine and Coronary Units) maintains aspects referred to donation and brain death as quality indicators, but none referred to the postoperative period of SOT or the management of immunosuppression.⁴

There is a certain training offer, albeit limited, in this setting, such as the course imparted by the ERS (European Respiratory Society), referred to practical aspects in lung transplantation. However, this offer is more conceived as an update for expert professionals already working in the field of transplants, and full knowledge of the bases and principles of all the abovementioned topics is taken for granted.⁵

The proposal was also raised that at least as regards the basic concepts, training should not be limited only to physicians who will directly care for patients of this kind, but also to any physician who may encounter a transplant recipient, i.e., a patient with immune suppression as a result of the medication received, in both the emergency and in the programmed patient care settings. Accordingly, training in the infectious complications and basic principles of immunosuppressive therapy should be extended to other specialties in addition to those inherently implicated in SOT. The growth in the number of transplants and the fact that the patients are geographically dispersed and often far from the 7 centers that perform lung transplants, logically implies that many are admitted to centers lacking a transplant program, and in which a minimum body of knowledge and skills are needed in order not to commit serious mistakes.

These data indirectly suggest that all the training programs should be updated, taking the mentioned suggestions into account, placing emphasis on the pertinent levels of responsibility and autonomy, and clarifying the capacitation and competence required of each specialist. Such a strategy could be based on the use of check-list type

instruments, which are not only easy to apply and follow but moreover also offer added value in terms of safety, and thus quality.⁶ Improving the quality of care in the Intensive Care Unit and promoting patient safety would be an ethical, scientific, social and economic imperative for the coming years,⁷ and there is no doubt that protocolized training can reach this objective. In this setting, we particularly reflected upon the low percentage of residents (41%) who answered affirmatively to the question of whether they had a clear idea of the training objectives in SOT— a situation that probably can also apply to other training settings among our residents.⁸ Furthermore, such competences should be evaluable, with a view to ensuring correct resident training. Lastly, as we are now well into the XXI Century, it would be advisable to incorporate Information and Telecommunication Techniques (ITTs),⁹ on-line courses, the discussion of practical problems and cases, and simulations as instruments to be considered in training not only in reference to SOT but also in all biomedical training areas.¹⁰

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Conflicts of interest

JR is a consultant and speaker for Astellas Pharma. JRM and RV are speakers for Astellas Pharma.

Appendix.

PLUTO (Postoperative Lung Transplantation) Network: **Hospital Vall d'Hebron, Barcelona:** Dr. Jordi Rello (Network coordinator), Dr. Joan Ramon Masclans, Dr. Judit Sacanell; **Hospital Reina Sofía, Córdoba:** Dr. Juan Carlos Robles, Dr. David Argueta; **Hospital Universitario A Coruña:** Dr. Teresa Rey, Dr. José María Borro; **Hospital Doce de Octubre, Madrid:** Dr. Matilde González, Dr. Eloisa López; **Hospital Puerta de Hierro, Madrid:** Dr. Reyes Iranzo, Dr. María Victoria Martínez; **Hospital Marqués de Valdecillas, Santander:** Dr. María Ángeles Ballesteros, Dr. Eduardo Miñambres; **Hospital La Fe, Valencia:** Dr. Rosario Vicente, Ignacio Moreno.

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