



Interdisciplinary interactive teaching PhD students in immunobiology of liver transplantations

V. Ganev,¹ T. Marinova,¹ V. Sarafian,² G. Zhelezova,¹ P. Yotovskiy,¹ L. Spassov¹

¹Faculty of Medicine, Sofia University "St. Kliment Ohridski" and University Hospital "Lozenets", Sofia, Bulgaria

²Medical University, Plovdiv, Bulgaria

Correspondence to: V. Ganev, ganev@med.uni-sofia.bg

INTRODUCTION

Currently, any patient who has chronic or acute liver disease that leads to the inability to sustain a normal quality of life or that results in life-threatening complications should be considered a candidate for liver transplantation. The indications for liver transplantation can be classified into four broad categories: acute liver failure (caused by viruses, drugs or toxins), chronic liver failure (advanced cirrhosis with commonest causes viral hepatitis, alcohol and primary biliary cirrhosis), metabolic liver disease, liver cancer (usually associated with cirrhosis, particularly cirrhosis resulting from viral hepatitis). The number of transplants in the UK is almost constant, between 550 and 600 per year, for the period 2003–2008. Scarborough et al have developed projections that the relationship between demand for liver transplantation in the US and the supply of liver transplant surgeons will remain stable over the next 15 years, with each surgeon performing an average of 12.9 procedures in 2020. On the other hand, the number of patients on the liver transplant waiting list in the US increased almost 16-fold between 1988 and 1997, and the number of waiting-list deaths increased almost 6-fold over the same period. As a result of these dynamics, the need for qualified hepatologists to manage patients before and after liver transplantation has dramatically increased. Accordingly, the field of transplant hepatology has emerged as a distinct focus of professional activity that encompasses aspects of gastroenterology and hepatology, surgery, multidisciplinary internal medicine, intensive care, image diagnostics, clinical chemistry, immunology, virology, pathology, and genetics. Transplant hepatology represents a unique discipline, with its own requisite skills and training requirements. Important boost to this discipline is the continuing research development, including more and more highly qualified academic professionals. Liver transplantation is a relatively young field in Bulgaria. University Hospital "Lozenets", Sofia, has the national lead with more than 30 transplants per year. The hospital has full-time faculty members capable of teaching a curriculum with a broad base of knowledge in biomedicine and transplant medicine.

GOALS AND OBJECTIVES

The program is a component of the biomedical PhD program of the Faculty of Medicine, Sofia University "St. Kliment Ohridski". The goal of the program is to provide basic training to physicians, surgeons, immunologists, pathologists, and biologists working, or desiring to work, in any area related to transplantation, and experience in all aspects of liver transplantation. Clinical, educational, and research applications of these training and experience are targeted throughout the program. Participants will develop a general understanding of liver transplantation. They will be trained to manage patients with end-stage liver disease, assess appropriate candidates for transplantation and to provide liver transplant recipients with post-operative care. The program will provide participants with their initial experience with the liver transplant procedure itself. It will conclude with training in advanced issues in liver transplantation, including living donor liver transplantation. The major aim of the program, besides high professional qualification of the trainees, is the building a sound basis for formation of successful PhD students with background in various biomedical fields for further modern research. In addition to the subject matter knowledge trainees gain, they will develop additional cognitive, team, communication, research and project planning skills that are eminently transferable within the sector.

BASIC CURRICULUM

Length of proposed program is one year (optional another one in research). The program is divided into two main modules – biology of the liver transplants and clinical management. Each module includes several lectures, formal presentations, practicals, and question-discussion periods.

The module on medical biology covers:

- liver anatomy – variants, surgical anatomy for splitting/reduction/liver donation,
- physiology and detailed pathophysiology of the liver and biliary systems,
- histopathology,
- transplantation immunology, tolerance in transplantation, HLA-system,
- infections – virology, microbiology, mycology,
- human genetics,
- metabolic liver diseases,
- cellular and molecular biology techniques in transplantation,
- planning research projects in experimental transplantology,
- bioethics and national regulation of organ transplantation,
- biostatistics,
- grant writing,
- research presentations,
- communicating research with professional and lay public.

The clinical management module includes:

- history of transplantation, future of transplantation,
- epidemiology and natural history of common and uncommon liver diseases and complications,
- acute and chronic liver failure: causes, complications,
- pathophysiology and treatment options,
- cell and tissue transplantation,
- immunosuppression, rejection,
- indications and contraindications for: deceased and live liver donation, liver transplantation and re-transplantation,
- principles of pre-op preparation and post-op management,
- complications of liver transplantation and their management,
- monitoring of the transplant recipient,
- organ procurement and organ preservation,
- planning research projects in clinical transplantology,
- ethics and national regulation of organ transplantation and procurement,
- statistics and clinical research protocol design,
- grant writing,
- research presentations,
- communicating research with professional and lay public.



In addition, the MD trainees must gain practical skills and experience in liver transplantation, including involvement in basic or clinical transplant research, under the direct supervision of a qualified transplant hepatologist and in conjunction with a liver transplant surgeon. The trainee must:

- be thoroughly acquainted in principle and practice with the management of patients with acute and chronic end-stage liver disease,
- be involved in the primary evaluation, presentation, and discussion at selection conferences of 20 or more potential transplant candidates,
- follow up at least 20 new liver transplant recipients for a minimum of 3 months from the time of their transplantation,
- be involved in the follow-up of 30 or more liver transplant recipients who have survived more than 1 year after liver transplantation to gain familiarity and expertise with the management of common long-term problems (e.g., cardiovascular disease, nephrotoxicity, screening for malignancies, and diagnosis and treatment of recurrent disease),
- understand the indications, contraindications, complications, and interpretation of allograft biopsies and must perform a minimum of 30 percutaneous biopsies during the training period. The trainee also should be familiar with the appropriate use of ultrasound-localized and laparoscopy-guided liver biopsies,
- acquire a current working knowledge of the organizational and logistical aspects of liver transplantation, including the training and role of nurse coordinators and other support staff, and organ procurement,
- participate as an observer in three liver transplantations. The trainee is expected to learn the principles of donor selection and rejection (e.g., hemodynamic management, donor organ steatosis, and indication for liver biopsy),
- become familiar with the following factors: (a) principles and practice of pediatric liver transplantation, (b) principles and application of artificial liver support, and (c) clinical research issues in transplant hepatology.

The University Hospital "Lozenets", Sofia, offers to the participants in the program excellent opportunities for basic or clinical transplant research. The hospital has a research strategy that documents current and planned activity, staff and other resources that support this activity, and objectives for development. The hospital has sufficient staff, space and facilities to support the research strategy and a funding system to support pilot projects. All clinical research studies have Research Ethics Committee approval. Patients give fully informed consent before participating in research studies. The collection, storage and use of donated tissues and organs for research conform to current national regulations.

SELFLEARNING

Teaching materials (presentations, textbooks, laboratory protocols, etc.) are posted on the web page of the program and can be downloaded by the registered participants. Structured tests and problems on most of the study fields are accessible online. Individual and group face-to-face and net discussions are scheduled. The University Hospital "Lozenets", Sofia, has an excellent library, with access to full-text papers in numerous medical electronic journals.

PROGRAM TEACHING STAFF

Director, Liver Transplantation Program – Lubomir Spassov, MD, PhD
Coordinator – Milen Vassilev, MD, E-mail: mvassilev@sf.cit.bg
Teaching Staff. All of the following are staff that is involved in providing the educational experience/teaching and have supervisory responsibilities over the participants.

- Petar Yotovskiy, MD, PhD – Anatomy, Histology, and Cytology
- Tsvetanka Marinova, MD, PhD, DSc – Human Biology, Immunology
- Victoria Sarafian, MD, PhD, DSc – Human Biology, Immunology
- Galina Zhelezova, MD, PhD – Microbiology and Virology
- Varban Ganev, MD, PhD, DSc – Medical Genetics and Biochemistry
- Lubomir Spassov, MD, PhD – Organ Transplantation
- Milen Vassilev, MD – Hepatology
- Assia Stancheva, MD – Diagnostic Laboratory
- Villy Pashev, MD – Surgery
- George Mutafov, MD – Anaesthesiology
- Zhechka Vassileva, MD – Internal Medicine, Hepatology
- Roumen Kalianski, MD – X-ray and Imaging Diagnostics
- George Hadjidekov, MD – X-ray and Imaging Diagnostics
- George Chobanov, PhD – Grant Writing, Statistics, and Communications

FACILITIES

University Hospital "Lozenets", Center for Transplantations, Sofia, Departments of Anatomy, Human Biology, Medical Genetics, and Microbiology of the Faculty of Medicine, Sofia University "St. Kliment Ohridski".

EVALUATION

The evaluation is based on patient care, medical knowledge, technical/operative skills, practice-based learning improvement, interpersonal and communication skills, professionalism, system-based learning, research contributions and the overall clinical competency and performance.

CERTIFICATE

To obtain certificates, participation in both sessions of this programme and attendance at all lectures, as well as participation in a pilot research project, is mandatory. Furthermore, participants will write two short essays on clinical or experimental transplantation and on an ethical issue. The essays will be reviewed by the members of the teaching staff.

DOCUMENTATION

The liver transplant program director provides a letter within two months of successful fellowship completion stating that the trainee has met all criteria as a liver transplantation physician. Monitoring of each individual fellow is the responsibility of the program director. Documentation of participation in the required didactic sessions and patient management experiences for each individual trainee should be kept on file by the director for certification.