Universitatea Transilvania din Brașov

HABILITATION THESIS
SUMMARY

CONTRIBUTIONS TO THE DEVELOPMENT OF THE CONCEPT OF MULTIDISCIPLINARITY IN INFECTIOUS DISEASES – FROM THEORY TO PRACTICE

Domain: Medicine

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The habilitation thesis "CONTRIBUTIONS TO THE DEVELOPMENT OF THE CONCEPT OF MULTIDISCIPLINARY IN INFECTIOUS DISEASES - FROM THEORY TO PRACTICE" presents in a unified manner my scientific, professional and academic achievements, following the activities carried out after obtaining the title of doctor in medical sciences in 2004, along with my personal plans for continuing my career development. The projects for continuing scientific research and personal professional development are based on obtaining the habilitation for the coordination of doctoral theses, a stage of maximum importance and value in the academic and scientific training for a teacher.

The first section of the thesis includes the presentation of personal scientific and professional achievements, in correlation with the level of knowledge in the research fields at that time.

Throughout the evolution of humanity and up to the present day, infectious diseases have represented a permanent presence and a major risk factor for public health, with a significant impact on the health status of the global population, on national and international health and economic systems. In this complex context, research in the field of infectious diseases has been and remains of utmost importance. The need for a multidisciplinary approach to infectious diseases is a reality for the overall management of the patient with an infectious disease or with other diseases that increase the risk of acquiring an infectious disease.

In this context, I have oriented my scientific research activity towards the vast field of infectious pathology and have collaborated with multidisciplinary teams to conduct research in fields related to infectious diseases but with important multilateral impact.

Chapter 1 presents the main results of scientific research, systematized into 4 research areas.

First research area is antimicrobial therapy policies in the prevention and treatment of bacterial infections, with a focus on the management of Clostridioides infection difficile and on the management of bacterial infections in the general context of antimicrobial resistance, both representing important public health problems, real challenges for the medical world and beyond, due to the significant impact it has on public health, on patients and on health systems, with costs of hundreds of millions annually.

An important category of patients in whom the risk of infection with Clostridiodes is demonstrated difficile is represented by surgical patients. 2 guidelines from the World Society for Emergency are presented Surgery (WSES), published in 2015 and 2019, with recommendations for the management of ICD in surgical patients. The final conclusion of the two guidelines is that the management of this infection requires a multidisciplinary approach, integrated between medical and surgical services, both from a curative and preventive point of view.

A study conducted to assess the organization of acute care units worldwide in the prevention and management of surgical infections is presented, to support the proposed acute care institution organizational standards. The results of the study provide recommendations regarding the prevention and management of surgical infections. Another study, conducted by an international multidisciplinary working group with the aim of developing a common vision

on the need for appropriate use of antibiotics in hospital settings, provides 10 recommended principles for the appropriate use of antibiotics that should be followed by all healthcare personnel in clinical practice.

Also in the context of the correct and appropriate application of antimicrobial therapy , a study on the pharmacological management of cholera is presented, with an emphasis on the fact that the main pharmacological progress in the management of cholera has been the use of antibiotics, along with pathogenic therapies for rapid replacement of hydroelectrolyte losses .

The second area of research is closely related to the latest pandemic in the evolution of humanity, namely the COVID-19 pandemic. The results of research on the impact of this pandemic disease at the population level and on medical services are presented.

The impact of the COVID-19 pandemic on healthcare systems has been major and profound, affecting both the medical infrastructure and the provision of medical services to the population. In this complex context, determined by the emergence of SARS-CoV-2 infection, scientific research in the field has faced major challenges.

Research is presented on various aspects of SARS-CoV-2 infection in pediatric and adult patients. Thus, two studies conducted on pediatric cases with surgical conditions and COVID-19 highlighted that the evolution of SARS-CoV-2 infection was mild and no significant complications were recorded, but the provision of pediatric surgical care in terms of elective procedures at the beginning of the pandemic was negatively influenced.

Research has been conducted on the impact of treatment with the antiviral Remdesivir in infants, the conclusion being that this therapy contributed to the favorable evolution of SARS-CoV-2 infection in this vulnerable category of patients. Thus, the study contributes to the development of medical experience regarding the usefulness of Remdesivir treatment in pediatric patients with COVID-19. We also evaluated the impact of this infection in newborns, another category of patients at risk for severe forms of infections in general. And in this case, our study contributes to the accumulation of medical experience regarding various aspects of SARS-CoV-2 infection in newborns in the absence of etiological treatment. Our data support the observation that SARS-CoV-2 infection in newborns is a relatively benign condition, with a good prognosis.

Regarding multisystemic involvement in COVID-19 in adults, the results of a study are presented that highlighted the fact that subacute thyroiditis is a potential complication associated with the SARS-CoV-2 virus.

The COVID-19 pandemic has also raised numerous ethical challenges, including that related to COVID-19 vaccination. An original study is presented, which addresses the possible problem of prioritizing access to the COVID-19 vaccine, based on both ethical and objective criteria. It was highlighted that at the European level each country has adapted and implemented its own vaccination policies, depending on the characteristics and needs of its citizens.

Addressing the issue of the impact of COVID-19 on medical services, a study is presented that followed the effect of the pandemic on the specific activity in a pathological anatomy service. The conclusion of the research was that during the COVID-19 pandemic, a decrease in

histopathological diagnoses was observed for both benign and malignant pathologies, compared to the same period 1 year before the pandemic.

The third area of research was represented by the multidisciplinary approach to people with infections and at high risk for infections. Cancer patients and patients with diabetes mellitus present an increased vulnerability to infections. Early diagnosis of cancers can favorably influence the risk of infection through interventions with modern, personalized therapies and cancer control can allow additional medical interventions that protect against infections, such as vaccination against infectious diseases. Thus, it can be stated that the diagnosis and treatment of cancers can reduce, by controlling the disease and restoring the immune system, the risk of infection in these patients. In this context, of the existence of etiopathogenic connections between infectious diseases and some non-infectious diseases , I also focused my research on aspects of breast oncological pathology, skin pathology and the challenges of diabetes mellitus, highlighting the multidisciplinary aspect of the medical field.

The fourth research direction focused on multidisciplinary research on actions to increase population safety by reducing risks, including infectious ones. Disease prevention can be achieved through numerous interventions, including the identification and effective application of measures for the control and prevention of communicable diseases, waste management, epidemiological surveillance for the rapid identification of the emergence and extension of communicable diseases, along with increasing the population's access to health care, including through the use of various technological applications that allow monitoring of people's health status. Thus, the multidisciplinary approach to disease risks can only be beneficial for patients and must be adopted as a course of conduct in medical practice. The results of original multidisciplinary research are presented on the management of infectious waste, including during the COVID-19 pandemic, on the need for preclinical evaluation of some chemical entities, a mandatory stage in the discovery process of new drugs, on the phylogeographic and phylogenetic analysis of some dengue virus strains serotype 3, which showed that both structural and non-structural parts of the genome are likely to shape the evolution of the DENV-3 genome. In the context of increasing life expectancy and the share of the elderly population globally, a situation that has also determined an increasing prevalence of multimorbidity , including infectious diseases , the results of a study are presented that aimed, within a project, to create an autonomous home surveillance system dedicated to the elderly, using modern Cloud / Edge technologies, which bring artificial intelligence in cooperation with WSAN (wireless sensor and actuator networks) distributed through IoT (Internet of Things).

Chapter 2 presents my professional and academic achievements. I graduated from the Faculty of General Medicine at the University of Medicine and Pharmacy in Iași in 1981 and after passing the graduation exam I became a doctor-physician with an average of 10. I did my internship at the Brașov County Hospital between 1987-1991 and in 1991 I became, through a national competition, a resident physician and I followed the residency training in the Specialization of Infectious Diseases at the Institute of Medicine and Pharmacy “ Gr.T.Popa ” in Iași between 1991-1994. I obtained the title of specialist in Infectious Diseases in 1994 and subsequently the title of primary physician in Infectious Diseases in 1999. I followed my doctoral studies at the Doctoral School of the University of Medicine and Pharmacy (UMF) “Gr.

T. Popa" Iaşi between 1997-2004, completing the thesis entitled "Contributions to the clinical and laboratory study of human trichinosis ". Between 2004-2005 I followed the Master's degree program in Health Management at Lucian Blaga University in Sibiu. Between 2005-2007 I was a master's student at the Master's degree in Nosocomial Infections at Transilvania University in Brașov, Faculty of Medicine.

From a medical point of view, I began my work in 1994 as a specialist physician in Infectious Diseases at the Făgăraș Municipal Hospital, where I also held the position of head of the Infectious Diseases section between 1997 and 1998. Since 1998, my medical activity has been carried out at the Brașov Clinical Hospital for Infectious Diseases, as a specialist, and then as a primary care physician. Between March 1999 and January 2021, in addition to my uninterrupted medical activity, I also held the position of head of the section in the Adult Clinical Ward I of the hospital. Between January 2021 and April 2022, in the midst of the COVID-19 pandemic, I held the position of Medical Director of the Brașov Clinical Hospital for Infectious Diseases, and from June 2022 to the present, I am the head of the Clinical Section of Infectious Diseases I Adults within the Brașov Clinical Hospital for Pneumophthisiology and Infectious Diseases.

I began my teaching career in 1998, holding the position of assistant professor at the Department of Infectious Diseases within the recently established Faculty of Medicine, which operates within the structure of Transilvania University of Brașov. From 2006 until September 2022, I held the position of head of works at the Department of Infectious Diseases. From October 2022 until today, I am an associate professor at the Department of Infectious Diseases.

I have been and am part of examination committees for the defense of bachelor's theses in the specialization of General Medical Assistance, committees for admission to the doctorate as well as for defending exams within the doctorate (doctoral students supervised by teaching staff from Transilvania University, Faculty of Medicine). In 2024 I was part of two committees for the defense of the doctoral thesis at the "Carol Davila" UMF in Bucharest , designated by order of the rector.

Regarding national and international recognition, I mention that I am a member of the Romanian National Society of Infectious Diseases and the Balkan Medical Union. I am currently a scientific referee for the journal Jurnal Medical Brașovean and the journal Bulletin of Transilvania University of Brașov . Series VI: Medical Sciences , indexed in international databases. I am a scientific referee for articles published in journals from the MDPI publishing house of scientific journals/journals. International recognition is highlighted by scientific articles published in international journals ranked ISI WOS ISI WOS: 22 articles, with 270 (260 excluding self-citations) citations and a HIRSCH index equal to 7.

The second section of my habilitation thesis refers to my career evolution and development plans. My professional evolution has been, is and will be a harmonious and constructive combination of my medical activity, as a professional in the field of infectious diseases, with the teaching activity, education and training of specialists in the medical sector and with the scientific research activity, contributing to the progress of knowledge in the vast medical field and in other related fields.

As general directions for continuing the development of my professional career as a doctor, I mainly aimed to improve my skills in the use of advanced diagnostic technologies (molecular biology techniques), participate in multidisciplinary teams in the development of new medical devices or programs to improve people's health, receive training in the field of providing specialized consultations in a virtual environment on specialized online medical platforms, and participate in actions to promote health policies and medical education in society on various current issues.

Teaching activities are closely related to professional medical activity and scientific research. I believe that teaching approaches must be directed towards harmonizing teaching-learning methods with the current needs for professional training of students. As directions for developing my professional teaching career, I have mainly proposed the creation of accessible and well-documented educational materials, including digital ones (online courses, virtual clinical case simulators) for students and resident doctors, the organization of postgraduate courses on current issues in the field of infectious diseases (reemerging diseases , emerging diseases, antibiotic therapy policies, healthcare-associated infections, etc.) for resident doctors and specialists from various medical specialties.

Scientific research is a mandatory academic attribute throughout my teaching career. I wish to continue my scientific research activity in the coming years, focused on studies on microbial resistance to antibiotics by expanding the use of molecular biology techniques; continuing research on Clostridioides infection difficile in different categories of patients; continuing research in the field of re-emerging diseases (measles, whooping cough) and emerging diseases (human metapneumovirus infection , etc.); involvement in research projects evaluating the possibility of involving artificial intelligence in increasing the quality of medical and educational teaching; organizing scientific events under the aegis of Transilvania University of Brașov.