
Habilitation thesis

Time "against the chronometer" of the potentially critical patient and the involvement of "point of care" techniques in emergency medicine

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ABSTRACT

Key words: point of care, sonostethoscope, biomarkers, critical patient, emergency

The particularities of emergency medical care. Emergency medicine faces many difficulties in conducting research, and it is necessary to find solutions for the development and application of research protocols. The most common impediments highlighted in countries with experience in the field, such as those in North America, are: inadequate training, insufficient time, inadequate funding.

At the level of our country, the major impediment is the poor development of emergency medicine disciplines, the lack of national centers or research collectives with experience in the field to train researchers and get involved in the integration of international networks.

The problem of prospective interventional clinical studies is limited by obtaining informed consent in critical patients.

Scientific, professional and academic achievements. Clinical records and scientific evidence of "bed side" and "point of care" type investigations are tools that integrated into the rapid clinical examination of the primary evaluation type bring more decision and reduce the time until the appropriate diagnostic-therapeutic management. The "sonostethoscope" and the appropriate training of the "point of care" examination in the emergency creates safety in making decisions immediately, at the patient's bedside, in the first moments after admission, reducing diagnostic and therapeutic errors.

The research directions developed after the doctoral studies were:

1. The introduction of ultrasonography in the practice of the emergency physician: triage, diagnosis, therapy guidance with studies:
 - a. "Ultrasonography as an integrated tool in clinical decision-making in the Emergency Department" - 1 ISI publication;
 - b. "Image library, a tool to avoid diagnostic errors in the emergency, during the COVID period, in patients with liver resections using the Habib technique" - 1 ISI publication not indexed WOS.
2. Evaluation of training in the use of sonostethoscope in practice with studies:
 - a. "Echo-Guided Cannulation of the Internal Jugular Vein Using the External Jugular Vein Approach by Inexperienced Residents" - 1 ISI publication;
 - b. Evaluation of the Romanian national FAST program: "Regional Emergency Medical Services Systems" - 1 BDI publication;

- c. Practice algorithms in critical situations with epidemiological impact – 1 ISI publication;
 - d. Simulation in the acquisition of ABC POCUS ultrasonographic examination skills – 1 ISI publication;
3. Interdisciplinary research to increase the accuracy of diagnostic-therapeutic management with studies:
 - a. Computerized models for ultrasound image evaluation – SonoDig project – 6 publications (2 ISI, 3 ISI Proceeding, 2 BDI);
 - b. Mathematical analysis for assessing the efficiency of defibrillation in the patient in cardiorespiratory arrest - UMFH student grant - 1 ISI publication;
4. Multicentric epidemiological studies in collaboration with the European Society of Emergency Medicine:
 - a. the European EuRODEM study of the European Society of Emergency Medicine – EuSEM – 6 ISI publications;
 - b. the European HEAD study of the European Society of Emergency Medicine - EuSEM in collaboration with AANZDEM – 3 ISI publications;
 - c. the European SYNCOPE study of EuSEM, Syncope management in ED (SEED) – 2 ISI publications;
5. Assessment of the role of biomarkers in the management of the critical patient in the emergency with the following studies:
 - a. Evaluation of biomarkers in the assessment of early survival after cardio-respiratory arrest with:
 - a.1. pilot study "Investigation of biomarkers variation post-return of spontaneous circulation following an out-of-hospital cardiac arrest" - UMFH student grant - 1 ISI publication;
 - a.2. a prospective, analytical, longitudinal, observational study on a cohort of patients presented from the pre-hospital after resuscitation for nontraumatic cardiorespiratory arrest of doctoral type – 4 publications (2 ISI, 1 ISI proceedings, 1 BDI)
 - b. Evaluation of biomarkers in the assessment of early survival after hemorrhagic stroke - doctoral study – 4 publications (2 ISI, 2 BDI)
 - c. Evaluation of biomarkers and prognostic scores in septic emergency patients - doctoral study – 2 ISI publications.

Collaboration during the postdoctoral period in 6 research and professional training grants (1 partner manager, 2 scientific coordinator, 3 researcher) provided the opportunity to develop project management skills (competence Project Management MZT865, 2017, CODECS Bucharest), to carry out of studies and the creation of scientific (ISI, BDI medical articles), didactic and training materials (practice guides, books, educational platforms for students and ultrasound for emergency physicians, etc.).

Plans for the development of the scientific career. For the development of the discipline, I believe that the research internships of young teachers in research centers of some European universities also offer the possibility of creating new research opportunities, but also of increasing international visibility, with the integration into European research projects.

The creation of a research core is a desired future difficult to materialize in practice due to the human and material resources at this moment, as well as the mentality of the specialists, the structure of the health system.

Another concern regarding the development and increase of the quality of the medical act consisted in the involvement in the life of professional societies in the field, initially as a member, and later in the Committees of the European Society of Emergency Medicine (EuSEM): Research Committee, Educational Committee, Ultrasound Committee.

I have participated in the congresses and conferences organized by professional societies, but also interdisciplinary with the profile of ultrasonography, intensive care, cardiology, with numerous poster or oral presentations and conferences as a guest giving lectures in the field of emergency medicine or the critical care patient and I also contributed to the organization of scientific events. Since 2014, we have initiated an Interdisciplinary Congress of Emergency Medicine with international participation structured on sections of workshops, simulation, research, education, with a section of young doctors.

Research remains one of the challenges for the development of the specialty at the national level, on whose performance depends medical practice itself and the future of quality emergency medical care.