

**”VICTOR BABEȘ” UNIVERSITY OF
MEDICINE AND PHARMACY FROM TIMIȘOARA
DOCTORAL SCHOOL
MEDICINE DOMAIN**



**RESEARCH IN MATERNAL-FETAL MEDICINE
BASED ON IMAGING AND GENETIC EVALUATION.
METHODS OF PREVENTION AND DIAGNOSIS IN
PATHOLOGY ASSOCIATED WITH PREGNANCY**

ABSTRACT

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The habilitation thesis entitled "**Research in maternal-fetal medicine based on imaging and genetic evaluation. Methods of prevention and diagnosis in pathology associated with pregnancy**" is an overview and also the result of my professional and academic activity of the last 15 years, which came after the defense of my doctoral thesis in 2004, entitled "Antenatal diagnosis of congenital anomalies".

The thesis is structured in 3 parts according to the recommendations of CNATDCU and the provisions of art. 300 paragraph (2) of the National Education Law, no. 1/2011.

The first part represents the synthesis of my entire scientific, research and academic activity in chronological order, including stages of my career progression. In this part are presented the the most important scientific articles, published in international journals, indexed ISI or BDI, scientific papers presented at National and International Congresses, books and research grants obtained through competition.

In the years following the defense of my doctoral thesis, the interest was directed towards several research fields of obstetrics and gynecology, but mainly towards the field of maternal-fetal medicine. Most of the results of my scientific work have been published in journals with impact factor and indexed in international databases such as: Scopus, Index Copernicus, etc.. The published scientific results cover up several fields in my specialty, however the most numerous works are being those that study the antenatal diagnosis of congenital anomalies, also other pregnancy-related conditions, such as premature birth, pregnancy associated thrombophilia and preeclampsia.

The results obtained after the defense of the doctoral thesis are structured in four main chapters:

The first chapter systematically presents the main results of the scientific research regarding the antenatal diagnosis of congenital anomalies. The debated topics were the following: the concept of maternal-fetal medicine, the history of maternal-fetal medicine, antenatal screening of congenital anomalies. This chapter also captions the pregnancy associated pathologies, namely: preeclampsia, thrombophilia and premature birth. After the research, scientific papers and articles were published targeting these topics. Some scientific papers addressed the relation between the infection with HPV and its role in developing cervical cancer. Through the cervical cancer screening process it was analyzed the risk occurrence of the high-grade lesions of the cervix.

Congenital anomalies are deviations from the normal anatomical architecture of an organ or system. They may result from an abnormal intrinsic primordium or a normal primordium that is affected during the development of extrinsic forces. Congenital anomalies are deviations from the normal anatomical architecture of an organ or system. They may result from an abnormal intrinsic primordium or a normal primordium that is affected during the development of extrinsic forces.

The incidence of birth defects is currently increasing due to the growing number of teratogenic and mutagenic environmental agents. Nelson and Holmes (1990) showed that approximately 2-3% of full-term newborns have at least one malformation. In Romania, 2,500-3,000 children are born annually with severe malformations, chromosomal abnormalities occur in ~ 0.5% of newborns. The risk of chromosomal abnormalities increases with the advanced age of the mother, while structural abnormalities such as translocations, deletions or Turner syndrome (45X) are not related to age.

Thus, in this sense, together with a multidisciplinary team at the Euroson 2008 Congress, we presented the one-year experience of the First Obstetrics and Gynecology Clinic of the Dumitru Popescu Clinical Hospital in Timișoara on genetic amniocentesis followed by antenatal genetic diagnosis. I later published in the European Journal of Ultrasonography in Medicine and Biology at Euroson 2008. We also published for the first time in the National in 2002, the first antenatal genetic diagnosis performed at a 22-week pregnancy. In the evaluation of congenital anomalies we had a close collaboration with the Genetics Discipline within UMFT, thus publishing in the European Journal of Genetics the results of Prenatal Diagnosis following the cytogenetic evaluation observed by performing a number of 750 amniocentesis and also in the case of recurrent abortions. Following the defense of my doctoral thesis in 2004, I published a Monograph on the Antenatal Diagnosis of Congenital Anomalies.

Also in this chapter I will present the results obtained in the study of pathologies associated with pregnancy such as: preeclampsia, thrombophilia and premature birth. In the case of pregnancies associated with hypertension we studied the correlation between certain biomarkers and HTAIS, as well as the value of plasma cortisol in pregnancies associated with hypertension or the correlation between obesity and preeclampsia. In the case of premature births, we conducted research on the correlation between the different stages of maternal anemia and premature birth. In

the case of pregnancy-associated thrombophilia (an increasingly common pathology and a major cause of miscarriage), I performed a macroscopic examination of the placenta with corrosive agents for thrombophilia-associated pregnancies and also examined by Doppler velocimetry on the uterine artery at 20 - 34 Ga pacing the course of pregnancy in patients receiving anticoagulant treatment for thrombophilia.

HPV infection and their involvement in the occurrence of high-risk cervical lesions and subsequent cervical cancer, has been the subject of a number of 14 published papers.

I also had interdisciplinary collaborations with colleagues in the specialties of psychology, psychiatry or chemistry, collaborations completed by publishing in ISI-listed journals.

I am convinced that these studies and articles published in many fields of my specialty, but also with colleagues from other specialties, are as strong arguments for my plurivalent development.

Chapters 2 and 3 of this section present my development and the doctoral and postdoctoral activity, which constituted and are the basis of my habilitation thesis.

Regarding the professional path, the activity I carried out at the "Victor Babeș" University of Medicine and Pharmacy in Timișoara as a teacher, is part of the University's objectives, both in terms of teaching and science. I went through all the stages of the academic hierarchy starting with the year 1991, when I became a university preparator at the "Victor Babeș" University of Medicine and Pharmacy in Timișoara, Discipline of Obstetrics and Gynecology. Since 2019 I am an Associate Professor in the same Discipline. I carry out my clinical activity at the Municipal Emergency Clinical Hospital in Timișoara, Department of Obstetrics - Gynecology |, as a primary care physician where since 2015 I am also Head of Department.

I am a member of various Scientific Societies as well as of the Commission for Evaluation and Assurance of Educational Quality within UMFT. I have also conducted numerous dissertations and been a lecturer in undergraduate and postgraduate courses. Throughout my professional, academic and scientific career, I have participated in numerous national and international congresses and conferences, both as a guest speaker, but also with oral presentations or posters, thus disseminating the results of my postdoctoral research. I wrote a monograph, participated as a co-author in the development of 6 Lito courses for students and co-authored a chapter in a Treatise on Surgery. The results of my research have also materialized through articles

published extensively in international and national journals, indexed by ISI Web of Science (55 articles), as well as in BDI indexed journals (25 articles) based on international data, respectively in the form of abstracts from ISI Web indexed journals ISI Web of Science, BDI, in volumes with ISBN or ISSN.

I carried out the research activity within several grants won through national and international competitions. Thus, I demonstrated the ability to lead research and development projects by coordinating two projects: one project as a manager and another as a technical-financial manager. I was also a member of the team of two projects with international collaboration, demonstrating the ability to work in a team and the efficiency of scientific collaborations.

The second section is dedicated to the directions of academic career development and scientific research and details the research and teaching objectives for the coming years. The development plan of my university career follows two directions, namely: scientific activity and teaching in order to permanently improve them. Also, in terms of teaching, the most important objectives are the continuous improvement of teaching methods and the content of teaching materials by publishing new and updated courses for students and residents.

The third section contains the main bibliographic references associated with the scientific content described in the previous sections.