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*Clinical and paraclinical particularities in
adolescent pregnancy*

PHD THESIS SUMMARY

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INTRODUCTION

Adolescence is an important stage in the life of every individual because important physical and psychological changes occur, which require careful medical and educational implication [1,2]. The World Health Organization stated in 2015 that approximately 11% of all births worldwide occur to young women aged 12-15 years. In 2017, was estimated that 22,5 million of adolescent girls in 60 countries have gone through childbirth and more significant, approximately 4,1 million adolescent girls were at least their second birth [3]. Teenage pregnancy is burdened by multiple maternal and fetal complications and these are more common among this population. In a 2017 WHO study, were analyzed more than 124,000 adolescent women who became mothers and the study concluded that they had a higher risk of pregnancy-induced hypertension, systemic infections, intrauterine growth restriction, preterm birth, neonatal or maternal death compared to women who patients aged 20-24 [3,4].

I chose this research topic because it is a very important public health that is constantly expanding and has a major impact, not only for the young mother and the newborn, but also for the whole family and society. The most important consequence of teenage pregnancy is about the maternal and fetal health, due to the frequent complication that result. In addition, teenage pregnancy has negative educational, social, economic and emotional results. Although school drop-out is increasing, it is even more pronounced among young mothers, who will not go back to school. This problem has many long-term consequences, such as making it difficult for mothers to find a suitable job and provide good education for their children. Teenage pregnancy is fraught with multiple problems and the reasons behind them are vast. The low education level and the lack of sexual education in school and college compound these problems. Also, training the new generations on methods of contraception would be a good element in preventing teenage pregnancy. Since most teenage pregnancies are unplanned and the first visit to the obstetrician is at the time of birth, neonatal complications may occur or fetal malformations may be detected late, some of which may even lead to death. Also, obstetric complication in this population group have a higher rate compared to the rest of the population with the potential for negative consequences.

I. GENERAL PART

CHAPTER 1. THE TRANSITION TO ADOLESCENCE

Adolescence is the stage in which a person's physical and social development takes place, all these changes being mediated by genetic, hormonal and environmental factors, ultimately, resulting in somatic maturation and reproductive capacity [5]. During this period of life, the development of cognitive ability, personal and social identity also takes place, ultimately leading to the adult stage [5].

I.1 Neuroendocrine development in adolescence

Neuroendocrine development during adolescence can be summarized as a result of multiple change occurring in the hypothalamic-pituitary axis, adrenal changes and growth hormone change [5]. The onset of adolescence is marked by pulsatile GnRH secretion [5]. GnRH, in turn, leads to stimulation of LH and FSH secretion, all of which occur under the influence of gonadotropins in the anterior pituitary, ultimately resulting in gonadal maturation and sex steroid production [5].

1.2 Development of secondary sexual characteristics during adolescence

Marshall and Tanner described two scales of assessing sexual maturation. These provide information on the development of sexual characteristics by assessing the external genitalia in male patients and by assessing the development of breasts and pubic hair in female patients [5-8].

1.2.1 Premature adrenarche

Premature adrenarche is a variable from the normal limits of puberty that does not pose medical issues, but occurs more frequently in females [5]. These are a sure sign of progression to puberty and do not require specific treatment, but should be differentiated from adrenal or gonadal pathology [5].

1.2.2 Premature thelarche

Premature thelarche is the isolated development of breasts before puberty, which according to studies differs according to race [5].

1.2.3 Early puberty

In terms of pathogenesis, precocious puberty has been divided into central or gonadotropin-dependent precocious puberty and peripheral or gonadotropin-independent precocious puberty. Central-type precocious puberty consists of early activation of the hypothalamic-pituitary axis resulting in increased gonadotropin and gonadal steroid formation via GnRH secretion [9]. Peripheral-type precocious puberty is characterized by pulsatile GnRH secretion, low levels of pituitary gonadotropins and increased serum estrogen concentrations. The cause of gonadotropin-independent precocious puberty is variable, but the most common source is granulosa tumors. The remaining causes may be other types of ovarian cysts, adrenal pathology or primary hypothyroidism [9].

CHAPTER 2. TEENAGE PREGNANCY

Teenage pregnancy is a topical public health issue, both in Romania and worldwide. The key problem is that young pregnancy women are often not physiologically, psychologically, emotionally or socially ready to become mothers. Epidemiologically, there are studies showing significant differences in the incidence of teenage pregnancy. In the United States of America, the incidence of childbirth among teenage patients has varied, with a decrease between 1991 and 2005 and an increase between 2005 and 2008. However, recent data show that between 2007 and 2019 the incidence decreased to the level of 1991-2005. The explanation for this decrease seems to be given by the much wider use of contraceptive methods, especially oral contraceptives [10-12]. In 2019, it was observed, that the teenage birth rate increases with maternal age, so that in the age group 10-14 years the incidence of birth was 0.2 per 1,000 birth and in the age group 15-19 years the incidence was 16.7 per 1,000 births [10,11]. According to 2019 data from Romanian Institute of Statistics, from 2011 to 2018 more than 18,000 patients aged 15-19 years gave birth in Romania [12,13].

2.1 Physiological change in teenage pregnancy

Physiological changes during pregnancy do not differ significantly between adolescent patients compared to adult patients, however, a biological overload occurs in the case of pregnant adolescents [14].

There are some particularities of the adaptive changes that occur in adolescent patients compared to adult patients during pregnancy. The need for calcium is high in the third

trimester of pregnancy, due to the rapid development of the fetal bone system, but this is compensated by the maternal calcium resources in the case of the adult woman. In the case of pregnant adolescents, who still need calcium for their own bone development, there may be a competition between maternal and fetal calcium requirements [3]. Also, in the case of patients who become pregnant 2 years after the start of menstruation, there is an increased risk of bone demineralization [15].

Adolescent girls are at increased risk of iron deficiency, so in the event of a pregnancy, the requirement will be increased, and the risk of developing severe iron deficiency anemia increases proportionally with the gestational age of the pregnancy [16].

Physiological growth during puberty is altered by the physiological changes of pregnancy, which is why the obstetric and neonatal prognosis can be burdened by multiple complications [15].

2.1.1 Changes in the cardiovascular system during pregnancy

Changes at this level occur under the indirect influence of hormones, but also under the direct influence of mechanical effects, as a result of adaptive changes within the other systems and the increased need of the cardiovascular system [16]. Blood volume increases by approximately 30-50% during pregnancy [16,17]. Cardiac output increases in parallel with blood volume [16].

2.1.2 Changes in the respiratory system during pregnancy

As progesterone levels rise with pregnancy, there is an increased responsiveness of the partial pressure of carbon dioxide, resulting in an increase in tidal volume and cardiac output [16].

Hyperventilation is normal during pregnancy, which ultimately leads to the appearance of respiratory alkalosis [16].

2.1.3 Hematological changes during pregnancy

From a hematological point of view, during pregnancy, adaptive mechanisms on blood volume and composition have the role of increasing the efficiency of circulation and transplacental exchanges for good fetal development, but also to protect maternal homeostasis [16].

In pregnancy, hypervolemia normally occurs by increasing blood volume by approximately 40-50% [16]. At the time of birth, hypervolemia has the role of protecting against blood loss [18].

2.1.4 Changes in the renal system during pregnancy

Adaptation of the renal system during pregnancy is dictated by hormonal changes in the other systems, so there is an increased excretion in the kidneys in response to increased maternal and fetal metabolism; also, fluid and electrolyte retention is altered in response to cardiovascular changes [16].

2.1.5 Changes in the gastrointestinal system during pregnancy

Estrogen decreases appetite, while progesterone increases appetite, so there is a balance in nutritional control [16]. The effects of progesterone also occur at the level of the esophagus, leading to damage to the lower esophageal sphincter, with an increased risk of gastroesophageal reflux [16].

2.1.6 Changes in the reproductive system

Talking about vascularization, the spiral arteries increase in size, the vascular resistance decreases, and the blood circulation at the uterine level is predominantly redistributed to the place of implantation of the placenta [16]. The uterus grows in size and changes its shape during pregnancy [16].

CHAPTER 3. THE IMPACT OF PREGNANCY ON THE ADOLESCENT POPULATION

The complications that occur in adolescent patients who become pregnant are multifactorial, so we can discuss about obstetrical and neonatal complications, but also about psycho-emotional or social consequences. All these implications are intricate and are based on the lack of maturation both physically and mentally [19].

According to studies, the risk of preeclampsia among teenage girls is two times higher compared to patients between the ages of 30 and 34 [20, 21]. Current data show that anemia complicates a significant number of pregnancies among adolescent girls, due to nutritional status [20].

The most common neonatal complications that occur in adolescent pregnancies are: premature birth, low birth weight for gestational age, stillbirth and neonatal death [20,22].

3.1. Obstetrical complications in teenage pregnancy

Preeclampsia in teenage pregnancy

Multiple studies have assessed the risk of preeclampsia in adolescent population. In a 10-year study in Atlanta, United States of America was concluded that patients under the age of 20 are at an extremely high risk of developing preeclampsia and eclampsia [23, 24].

Anemia associated with pregnancy in adolescents

Anemia is the most common nutritional problem in the adolescent population in developing countries [25]. Currently, there are studies that have evaluated anemia during pregnancy in adolescents. Since adolescence is a period marked by physical, mental, educational and emotional changes, nutritional status can be affected so that there is a predisposition to the occurrence of anemia, ultimately resulting in an increased risk of morbidity [25].

Anemia, as a complication associated with pregnancy, increases the risk of obstetric and neonatal complications, and the most important are represented by:

- premature birth
- ante- and post-natal haemorrhage
- maternal death
- the newborn with low weight for gestational age
- neonatal death [26].

3.2. Neonatal complications in teenage pregnancy

A large systematic review evaluating young adolescent girls, under 15 years of age or less than two years after menarche, in underdeveloped or developing countries found that pregnancy has a negative impact on maternal and fetal growth [27,28]. Also, in this research it was established that there is a relative relationship between the young age of the mother, anemia, premature birth and neonatal death [27, 28]. Neonatal complications, which include preterm birth, low birth weight, and asphyxia, have a higher rate among newborns of teenage

mothers, all of which increase the risks of death or medical problems for these children both immediately and in the long term.

Premature birth in teenage pregnancy

Most researches show that preterm birth has a higher incidence among adolescent population compared to the rest of the population, but the data can be different. A retrospective study conducted in Macedonia in a regional hospital over a 3-year period evaluated neonatal complications among patients under 19 compared to the women aged 20-24 years [22]. Out of the total number of births, 128 teenage girls gave birth during this period, representing a percentage of 2.27% [22]. The incidence of preterm birth in the adolescent population was 10.4% compared to 16.9% in the 20-24 age group [22].

Low birth weight of girls of teenage mothers

Data from the specialized literature have shown that newborns from teenage mothers are at increased risk of low birth weight compared to the adult population. In a study that evaluated more than 4,746 patients who gave birth, 20.6% of them were teenagers, 9.6% were younger than 18, and 11% were between 18 and 19 years of age. Low birth weight for patients under 18 years of age was twice as high as for girls born to adult mothers and three times higher for those born to mothers aged between 18 and 19 [29].

3.3. The psycho-emotional consequences of teenage pregnancy

In addition to the medical complications associated with pregnancy in the adolescent population, the psychological impact is noteworthy, and the most significant is the depressive syndrome.

Studies have shown that in the case of adolescent patients, the rate of depression, both antenatal and postnatal, is significantly higher [20]. The incidence of postpartum depression in patients aged between 15 and 19 is twice as high as in patients over 25 [20].

3.4. Pregnancy management among adolescent girls

Establishing appropriate management of pregnancy in the adolescent population involves several aspects. Because teenage pregnancy carries an increased risk of obstetric and neonatal complications, it is important to introduce educational programs and specialized medical services for appropriate prenatal consultations in this population group. Data related to antenatal visits among adolescent girls varies according to the economic status of each country. Health programs for pregnant adolescents have been introduced in many developed countries. Thus, in Sweden, a significant number of complications associated with teenage pregnancy have been reduced, and the explanation lies in the fact that the socioeconomic and medical levels are high.

The lack of antenatal care of pregnancy among the adolescent population leads to obstetric and neonatal complications, and this fact is also observed in terms of the method of delivery. Data on the type of birth in the adolescent population vary according to temporal and demographic factors.

In Sweden, patients aged 19 years or younger are significantly more likely to give birth vaginally compared to patients in the 20-30 age group [30]. Also, the study carried out in Turkey demonstrated that vaginal birth was more frequent in the case of adolescent patients compared to cesarean delivery, the incidences being 55.2% and 44.8%, respectively [26].

II. PERSONAL CONTRIBUTIONS

CHAPTER 4. INTRODUCTION

Working hypothesis and general objectives

Pregnancy among teenagers represents a challenge for the health system, especially because it has maternal, fetal, and social repercussions. The complications that occur within this population group are closely related to maternal immaturity both physically and psychologically, and the consequences are observed in the short and long term. Lack of education regarding pregnancy monitoring has negative outcomes on maternal and fetal prognosis. If adolescent patients benefited from appropriate antenatal consultations, complications such as preeclampsia, premature birth, neonatal or maternal death could be avoided.

The present work, "Clinical and paraclinical particularities in adolescent pregnancy" aims to evaluate the impact of pregnancy in the 13-19 age group, from the point of view of maternal and fetal complications. The thesis is structured in 3 objectives and aims to establish the risk factors associated with teenage girls and the complications arising from them both in the mother and in her newborn.

Objective 1 aimed at determining clinical and paraclinical features of the entire studied batch.

Within *objective 2*, we identified the particularities of pregnant patients under or equal to 16 years of age and those over 16 years of age.

Objective 3 determined the risk factors that are associated with pregnant patients aged less than or equal to 16 years.

The research in this thesis is framed as a retrospective case-control analytical investigation and only this typology will be reviewed. The study included 464 pregnant patients aged between 13-19 years, who gave birth in the Bucharest Emergency University Hospital during 01.10.2018-15.04.2022.

CHAPTER 5. MATERIAL AND METHODS

The research in this thesis is framed as an observational investigation - to investigate the first two objectives, but also an analytical case-control investigation - for objective 3. Given that the analytical investigation is more complex compared to the descriptive investigation, as it includes characteristics specific to it, we will review only the typology of the analytical investigation

The total batch of patients was composed of 464 people, who presented and gave birth at the Bucharest Emergency University Hospital between 01.10.2018 and 15.04.2022.

The inclusion criteria of the patients were:

- The age of patients must be less than or equal to 19 years
- Patients or legal representative, in the case of patients under the age of 16, to agree to sign the informed consent in order to participate in the study

The exclusion criteria of the patients were:

- Age of patients over 19 years

- Lack of informed consent signed by the patient or the legal representative, in the case of patients under 16 years of age

This study was carried out with the approval of the Ethics Committee of the Bucharest University Emergency Hospital no. 56150/31.10.2018. The patients were informed about the objectives of the study and they were made aware that during the data processing and analysis phase the confidentiality and anonymity of the information provided will be ensured and that it will be used only for didactic purposes especially.

In this research, with the vast majority of qualitative (nominal) variables, we will only review the Chi-square test, 2x2 contingency table, and risk factor measurement.

CHAPTER 6. RESULTS

Objective 1 aimed to determine the clinical and paraclinical characteristics of pregnant patients aged less than or equal to 19 years.

Within this objective, it was revealed that the majority of patients (68.53%) in this study did not perform any antenatal check-up.

Vaginal birth among adolescent patients was predominant (54.74%), but the difference between the two types of birth was not significant. Regarding the indications for caesarean section, the most frequent were, in order:

- Cephalopelvic disproportion (23.33%)
- Imminence of uterine rupture on scarred uterus after caesarean section (19.52%)
- Fetal distress (17.62%)
- Preeclampsia (12.38%)

It was found that 87.28% of adolescent patients gave birth at term, however, a percentage of 12.72% had a preterm birth.

The average fetal weight was 2,955.51, and most teenage girls gave birth to a fetus weighing between 3,000 and 3,499 of grams (38.36%).

The average Apgar score at one minute was 8.61, with most newborns receiving an Apgar score of 9.

Anemia was diagnosed in 11.85% of adolescent patients, the highest incidence being in the case of 15-year-old patients, amounting to a percentage of 27.27% of the total cases of anemia.

Infection with the SARS-CoV2 virus was diagnosed in the case of 17 patients, representing a percentage of only 3.66%.

Objective 2 aimed to identify the clinical and paraclinical characteristics of pregnant patients in the age groups 13-16 years and 17-19 years respectively

Given that the average age of the patients was 17 years, for clinical, paraclinical and physiological reasons, we decided to divide the total group into patients with an age of less than or equal to 16 years and patients with an age of over 16 years, with the aim of to highlight the characteristics of the patients in each batch.

Patients aged between 13 and 16 represented a percentage of 24.14%, meaning 112 patients.

Most patients aged 16 years or younger gave birth to a fetus weighing between 2,500 and 2,999 grams (33.04%), while in the 17-19 age group there were predominantly newborns weighing between 3,000 and 3,499 grams (41.76%). According to these data, there is a statically significant difference between patients aged less than or equal to 16 years and patients above this age in terms of newborn weight. Patients aged less than or equal to 16 years give birth more frequently to fetus weighed less than 1,000 grams and up to 2,000 grams.

In the current work, a statistically significant association was demonstrated between patients in the age group of 13-16 years and premature birth (Chi-square=70.36, p=0.001). Thus, these patients have a higher risk of premature birth compared to patients over 16 years of age.

Anemia is more frequently diagnosed among patients aged between 13 and 16 compared to the rest of the patients, and according to the Chi-square test there is a statistically significant association between the diagnosis of anemia and patients aged less than or equal to 16 years (Chi-square= 31.50, p=0.001).

Among patients in the 17-19 age group, the most frequent indications for caesarean section were:

- Imminence of uterine rupture on scarred uterus after caesarean section
- Cephalopelvic disproportion
- Fetal distress

In the case of patients aged less than or equal to 16 years, the indications for caesarean section were, in order of frequency:

- Cephalopelvic disproportion
- Fetal distress
- Preeclampsia

According to the statistical analysis, it was concluded that there is a statistically significant association between patients aged between 13 and 16 years and the indications of:

- Cephalo-pelvic disproportion (Chi-square=48.52, p=0.001)
- Fetal distress (Chi-square=35.86, p=0.001).
- Preeclampsia (Chi-square=37.92, p=0.001).

Objective 3 aimed to determine the risk factors for pregnancy in patients aged less than or equal to 16 years.

Within this objective there were established multiply risk factors for this group of patients.

Regarding the dispensary of the pregnancy, these patients have a 3.48 times higher risk of not having any prenatal consultation compared to the rest of the patients.

The risk of preterm birth is 3.60 times higher in the group of patients aged 13-16 years who are diagnosed with anemia compared to those of the same age who are not diagnosed with anemia. Also, the presence of anemia in this group of patients leads to a 2.87-fold increase in the risk of developing preeclampsia compared to patients in the same group, but who are not diagnosed with anemia.

In addition, patients aged less than or equal to 16 years have a 2.95 times higher risk of developing fetal distress (Chi-square=35.86, p=0.001, OR=2.95).

In the case of patients who give birth at term and have a diagnosis of fetal distress, there is a 1.60 higher risk of giving birth to a fetus weighing less than 3,000 grams, compared to the rest of patients who give birth at term.

The association of anemia in the case of patients aged less than or equal to 16 years presents a 3.31 times greater risk of developing preeclampsia and to give birth prematurely (Chi-square=16.25, p=0.001, OR=3.31).

CHAPTER 7. DISCUSSIONS

In the present thesis, the data from a number of 464 adolescent patients, aged between 13 and 19 years, who gave birth in the Bucharest University Emergency Hospital between 01.10.2018 and 15.04.2022, were processed. The patients included in the study signed the informed consent or the legal representative in the case of patients younger than or equal to 16 years of age.

Regarding the type of delivery among patients aged less than or equal to 19 years, the prevalence in the present thesis was 54.74% for vaginal delivery and 45.26% for cesarean delivery. Most studies show that a significantly higher number of adolescent girls give birth vaginally compared to those requiring caesarean section [26,31].

In specialized studies, premature birth among teenage girls represents an important percentage, but which still shows a great variability between 9.09% and 37.5% [26,31,32]. In the current study, premature birth occurred in a significant percentage of 12.27% of cases, the most frequent were in 15- and 16-year-old patients, representing a percentage of 30.51% respectively 20.34% of the total number of premature births in the studied group.

Anemia is a pathology frequently associated with pregnancy, especially among teenage girls, and in studies its prevalence among patients aged less than or equal to 19 years varies, with significant differences, between 26% and 57.1%, depending on various demographic factors [22, 26, 33, 34]. Although in this study, the prevalence of anemia among pregnant patients aged between 13 and 19 years is much lower than the data from the specialized literature, the percentage of 11.85% is significantly high for the studied group.

CHAPTER 8. CONCLUSIONS

Pregnancy among teenagers represents a global public health problem, which affects the mother, the fetus, but also future generations so that its impact is both short-term and long-lasting. Currently, there are sex education programs implemented in developed countries and in some developing countries. These programs prove their effectiveness by decreasing the number of births in the adolescent population, but also by decreasing the number of maternal and fetal complications that occur following teenage pregnancy.

In this thesis, it was established that patients younger than or equal to 16 years of age present certain characteristics, which are more common than in the case of older patients.

Thus, regarding the associated pathologies, patients in the age group of 13-16 years are more frequently diagnosed with anemia.

In relation to neonatal complications, patients aged less than or equal to 16 years have a higher risk of preterm birth, but also of giving birth to lower birth weight fetus compared to the 17-19 age group. From the point of view of obstetrical complications, the most frequent indications for cesarean delivery, in the case of patients in the 13-16 years group, are represented by cephalo-pelvic disproportion, fetal distress and preeclampsia. Comparatively, in the age group 17-19 years, the most common indications for caesarean section are: imminence uterine rupture on post-caesarean scar, cephalo-pelvic disproportion and fetal distress.

Also, in the age group of 13-16 year old patients, there are a number of specific risk factors.

Anemia is a risk factor for both premature birth and preeclampsia, but also for the association of these two pathologies.

Fetal distress is a risk factor for both preterm birth and low birth weight.

According to the data presented and those that exist in the specialized literature, it is important to educate adolescent patients in terms of sexual life, as well as the organization of pregnancy integration and monitoring programs in order to prevent complications. Promoting contraceptive methods within the adolescent population would reduce the incidence of sexually transmitted diseases.

It is important to understand the needs of teenagers, but it is also necessary to educate them and the multidisciplinary involvement of medical personnel including the family doctor, the psychiatrist, the obstetrician-gynecology doctor, along with society and family is imperative.

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Anexes

List of Scientific papers developed and published

A. Articles published in ISI listed journals

1. Pain in Surgical Uterine Pathology. Authors: Bohiltea Roxana, Turcan Natalia, Nstasia Serban, Mehedintu Claudia, Munteanu Octavian, Uzunov Ana, Voicu Diana, Radoi Viorica, Monica Cîrstoiuu. Filodiritto Editore – Proceedings of The 14th National Congress of Urogynecology (7-9 September 2017), The National Conference of the Romanian Association for the Study of Pain (26-27 October 2017), ISBN 978-88-95922-98-0
2. Uzunov, AV, Bohiltea, RE, Munteanu, O., Nemescu, D., & Cirstoiu, MM (2020). A retrospective study regarding the method of delivery of adolescents in a Romanian Hospital. *Experimental and Therapeutic Medicine*, 20(3), 2444-2448
3. Mode of Delivery and Neonatal Outcome in Adolescent Pregnancy (13–16 Years Old) Associated with Anemia. Uzunov, AV, Cîrstoiu, MM, Secară, DC, Crîngu-Ionescu, A., Matei, A., Mehedințu, C., & Varlas, VN (2022). *Medicine*, 58(12), 1796.

B. Articles published in PubMed or BDI indexed journals

4. Management of bimalleolar fracture in pregnancy. Authors: Ana Uzunov, Dan Popescu, Oana Bodean, Octavian Munteanu, Diana Voicu, Luciana Arsene, Florina Paulet, Monica Cirstoiu, Catalin Cirstoiu. Romanian Journal Of Orthopedic Surgery and Traumatology, vol 1, issue 1, 2018, pg 2-6
5. An update on osteoporosis. Oana Bodean, Octavian Munteanu, Diana Voicu, Luciana Arsene, Ana Uzunov, Florina Paulet, Monica Cirstoiu. Romanian Journal Of Orthopedic Surgery and Traumatology, vol 1, issue 1, 2018, pg 38-43
6. Clinicopathological correlations in leiomyosarcoma of the uterine corpus – a short series of cases and literature review – Revista Ginecologia.ro 21(3)2018: 32-39, authors: Munteanu O, Voicu D, Arsene L, Uzunov A, Sajin M, Georgescu TA, Dumitru A, Albu R, Cirstoiu MM
7. Ante-, intra- and postpartum management of a pregnant adolescent diagnosed with Hodgkin's lymphoma. Authors: Diana Voicu, Ana Uzunov, Octavian Munteanu, Florina Păuleț, Monica Cîrstoiu. Gynecology Magazine Year VII • No. 25 (3) Sept 2019
8. Our experience in the management of pregnancy in adolescents. Authors: Uzunov, A., Munteanu, O., Cîrstoiu, MM (2019) Journal of Obstetrics and Gynecology Volume LXVII • Number 4 • DOI: 10.26416/ObsGin.67.4.2019
9. The management of a patient with pregnancy-acquired hemophilia – a case report. Authors: AV Uzunov, D. Secară, O. Munteanu, AM Oproiu, MM Cîrstoiu. Ginecologia.ro magazine, Year VIII, No. 29 (3/2020)
10. Pregnancy-associated digestive cancer – diagnosis and management – Ginecologia.ro magazine. Year VIII, No. 30 (4):12-16, authors: Ana Uzunov, Diana Voicu, Diana Secara, Octavian Munteanu, Natalia Turcan, Oana Bodean, Adrian Dumitru, Maria Sajin, Polixenia Iorga, Corina Pop, Monica Cirstoiu
11. Our experience in the management of pregnant women with SARS COD 2 infection - Ginecologia.ro magazine. Year IX, No. 32 (2) May 2021, pg: 6-10, Authors: Secara Diana, Uzunov A, Banete M, Sajin M, Cirstoiu M.
12. Obstetrical and neonatal outcome of pregnancies complicated by SARS-COV-2 infection - Revista Obstetrica si Gynecologia- Revista Societatii de Obstetrica si Gynecologia, Number 3. JULY-SEPTEMBER 2021 , pages 122-125 - authors: Madalina Daniela Iordache, Diana Secara, Ana Veronica Uzunov, Natalia Turcan, Monica Cirstoiu

13. Challenges of the management of cancer in pregnant women during the COVID-19 pandemic. Diana Secară, Ana Veronica Uzunov, Alexandru Baroș, Andreea Veronica Andreescu, Antoine Edu, Claudia Mehedițu, Andreea Carp-Velișcu, Monica Mihaela Cîrstoiu. Ro J Med Pract. 2021;16(Suppl6).DOI: 10.37897/RJMP.2021.S6.15
14. Management of placenta percreta – case report and clinical experience. Diana Cristina Secara, Claudia Mehedintu, Andreea Carp-Velișcu, Antoine Edu, Oana Mihaela Teodor, Alice Negru, Delia Gradinaru-Fometescu, Traian Vasile Constantin, Ana Veronica Uzunov, Elvira Bratila, Monica Mihaela Cirstoiu. Ro J Med Pract. 2021;16(Suppl6).DOI: 10.37897/RJMP.2021.S6.20
15. Muscle-skeletal metastatic pattern in vulvar cancer – Revista Romanian Journal of Orthopedic Surgery and Traumatology, Volume 4, Issue 2, July-December 2021. pp:78-82 – authors: Diana Secara, Daniela Meca, Sorin Vasilescu, Ana Uzunov, Alexandru Baros, George Pariza, Madalina Iordache, Maria Sajin, Adrian Dumitru, Bogdan Cretu, Catalin Cîrstoiu, Natalia Turcan, Monica Mihaela Cîrstoiu
16. Management of cerebral neoplasia during pregnancy – Revista Ginecologia.ro, Year X, No. 36(2)may 2022 pg. 24-28 – authors: Diana Secara, Octavian Munteanu, Alexandru Baros, Gabriela Radu, Ana Uzunov, Monica Cirstoiu
17. Neonatal outcome of adolescent pregnancies complicated with anemia – Revista Ginecologia.ro, Year X, No. 36(2)may 2022 pg. 34-36 – authors: Diana Secara, Ana Uzunov, Octavian Munteanu, Alexandru Baros, Monica Cirstoiu
18. Surgical management of digestive neoplasia with genital invasion – Medical Image Database magazine, ISSN 2602-0459, Vol. 5, No. 1 2022 – authors: Diana Secara, Cirstoiu Monica, Ana Uzunov
19. Fetal annexes changes in chorioamniotitis and premature rupture of membranes – Medical Image Database magazine, ISSN 2602-0459, Vol. 5, No. 1 2022 – authors: Andreea Mihart, Ana Uzunov, Cirstoiu Monica
20. Abruptio placentae during preeclampsia-like syndrome associated with COVID-19 – Medical Image Database magazine, ISSN 2602-0459, Vol. 5, No. 1 2022 – authors: Diana Secara, Ana Uzunov, Cirstoiu Monica
21. Neonatal outcome associated with maternal COVID-19 infection in adolescent patients. Uzunov, AV, Secara, DC, & Cirstoiu, MM (2022). Cureus, 14(9).

22. Difference between Preterm Birth in Adolescent and Adult Patients. Uzunov, AV, Secara, DC, Constantin, AE, Mehedintu, C., & Cirstoiu, MM (2022).. *Maedica A Journal of Clinical Medicine*, 17(4).
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C. Extensive publications appearing in papers of the main international specialized conferences and summaries of the papers presented at international specialized conferences published in ISI rated journals

24. The incidence of prematurity and associated short-term complications in a multidisciplinary emergency hospital from Romania. Authors: Roxana Bohîltea, Natalia Turcan, Oana Toader, Crîngu Ionescu, Şerban Nastasia, Octavian Munteanu, Alexandru Baroş, Diana Voicu, Ana Uzunov, Monica Cîrstoiu, ISUOG 2017
25. Determination of vitamin D in pregnancy. Authors: Rohana Bohiltea, N. Turcan, Viorica Radoi, R. Ursu, A. Uzunov, Monica Cirstoiu. *Romanian Laboratory Journal*, supplement volume 25, no. 2, April 2017, ISSN 1841-6624, ISSN ONLINE 2284-5623
26. Pregnancy association of abnormal Doppler indeces with inherited thrombophilia – 27th World Congress of Ultrasound in Obstetrics and Gynecology 16-19 September 2017, Vienna, Austria – published in *Ultrasound in Obstetrics and Gynecology*, Volume 50, Suppl. 1, September 2017 ISSN 0960-7692 – authors: R Bohaltea, N Turcan, O Munteanu, A Uzunov, O Toader, C Berceanu, C Mehedintu, S Nastasia, M Cirstoiu
27. Critically ill patient in perinatal medicine peripartum hysterectomy. Roxana Elena Bohiltea, Natalia Turcan, Ana Uzunov, Monica Mihaela Cîrstoiu. XIII World Congress of Perinatal Medicine Belgrade October 26-29, 2017. *J. Perinat. Med.* 45 (2017)

D. Other scientific works - summary studies published in scientific journals/volumes

28. Pregnancy overlaid to myelofibrosis with myeloid metaplasia - case report. RE Bohiltea, E. Niculescu Mizil, AM Vlădăreanu, N. Turcan, O. Toader, A. Uzunov, M. Cîrstoiu. Congress of the "Carol Davila" University of Medicine and Pharmacy, 5th edition, May 29-31, 2017, Bucharest, Palatului Hall
29. Comparative analysis of neonatal outcome of premature infants and infants with intrauterine growth restriction. N. Turcan, R. Bohiltea, A. Uzunov, O. Munteanu, D. Voicu, A. Baroș, M. Cîrstoiu. Congress of the "Carol Davila" University of Medicine and Pharmacy, 5th edition, May 29-31, 2017, Bucharest, Palatului Hall
30. Present - Day Efficiency Of Ultrasonographic Examination In Infertility. Authors: Roxana Bohiltea, Alexandru Baroș, Ana Uzunov, Monica Cîrstoiu-The 8th Romanian "Ian Donald" Course Inter-University School of Medical Ultrasound, September 27-28, 2017, Cluj Napoca, Obstetrics and Gynecology LXV (2017) Supplement ISSN 1220- 5532
31. Pain in surgical uterine pathology - Roxana Bohiltea, Natalia Țurcan, Nastasia S, Mehedințu C, Munteanu O, Baros A, Uzunov A, Bodean O, Voicu D, Monica Cîrstoiu National Conference organized by the Romanian Association for the Study of Pain ,Postoperative and posttraumatic pain' , October 26-27, 2017, ISSN 978-973-0-25655-0
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33. Comparative analysis of neonatal outcome of premature infants and infants with intrauterine growth restriction. N. Turcan, R. Bohiltea, A. Uzunov, O. Munteanu, D. Voicu, A. Baros, M. Cirstoiu. Maedica Magazine, vol 12(15) supplement 2017
34. Acute pulmonary edema in pregnant women with morbid obesity. Case presentation. Andreea Ruxandra Albu, Corina Ioana Gorgoi, Cătălin Nenciu, Ana Uzunov, George Ilie, Sevim Baubec, Alina Toma, Mohammed Khattab, Mirela Urucu, Monica Cîrstoiu. Ginecologia.ro magazine, year VI, no. 19 (1) 2018
35. Peculiarities of HPV infection in menopausal women. Authors: Octavian Munteanu, Luciana Arsene, O. Bodean, D. Voicu, F. Paulet, A. Uzunov, C. Berceanu, M. Cirstoiu - IV National HPV Congress', June 14-16, 2018, Sinaia
36. The impact of endometriosis and adenomyosis on the mother-fetus binomial. Monica Cîrstoiu, Octavian Munteanu, Diana Voicu, Luciana Arsene, Ana Uzunov, Florina

- Pauleț, Oana Bodean, 17th Congress of the Romanian Society of Obstetrics and Gynecology, September 20-22, 2018, Iasi
37. Management of pregnant women with Sjögren's syndrome - case report. Octavian Munteanu, Ana Uzunov, Luciana Arsene, Diana Voicu, Oana Bodean, Monica Cîrstoiu 17th Congress of the Romanian Society of Obstetrics and Gynecology, September 20-22, 2018, Iasi
 38. Colon neoplasm and pregnancy - case report. Octavian Munteanu, Diana Voicu, Florina Paulet, Ana Uzunov, Luciana Arsene¹, Oana Bodean, Daniel Voiculescu, Maria Sajin, Monica Cîrstoiu. The 17th Congress of the Romanian Society of Obstetrics and Gynecology, September 20-22, 2018, Iasi
 39. Management of adolescent pregnancies in University Emergency Hospital Bucharest- IXth Edition of the Congress of the CAROL DAVILA University of Medicine and Pharmacy Bucharest, November 25-27, 2021- authors: Ana Veronica Uzunov, Diana Secara, Monica Mihaela Cirstoiu
 40. Acute Renal Failure Induced by Preeclampsia in a Pregnant Woman With COVID-19. Diana Secara, Dana Meca, An Uzunov, Aida Petca, Claudia Mehedintu, Razvan Petca, Mihai Dumitrascu, Francesca Frincu, Monica Cirstoiu, Romanian JOURNAL OF Emergency Surgery, Vol3, No. 1, 2021
 41. A rare case of ovarian cancer in a 19-year old patient. Diana Secara, Ana Uzunov, Alexandru Baros, Mihai Dumitrascu, Florica Sandru, Claudia Mehedintu, Monica Cirstoiu, Romanian JOURNAL OF Emergency Surgery, Vol.8, No4, December 2021
 42. Management of cerebral neoplasia during pregnancy - "Hot topics in OG" - Gynecology Forum, March 24-25, 2022, Bucharest, Romania, authors: Monica Cirstoiu, Alexandru Baros, Octavian Munteanu, Lidia Radu, Ana Uzunov, Diana Secara - summarized in Ginecologia.ro magazine, Year X, No. 35(1) March 2022 Suppl. 1 page 16
 43. Maternal and fetal mortality among adolescent patients. Ana Veronica Uzunov, Daniela-Cătălina Meca, Monica-Mihaela Cîrstoiu. Ginecologia.ro magazine, year X, no 38 (4) 2022

Books and book chapters

44. Co-author of the chapter "Colorectal cancer with genital findings in a 22-year-old patient" pg.: 131-144, authors: Diana Secara, Ana Uzunov, Monica Cirstoiu in

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