

# Childbearing after 40 Years: A Challenge of the Modern Obstetrics

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## ABSTRACT

**Aim:** Age at delivery has increased in the past decades, leading to a continuous growth of the number of women planning a pregnancy after the age of forty. Because delivering after this age is associated with an increased rate of maternal complications, the objective of this study was to analyze the delivery related issues in women  $\geq 40$  years of age.

**Materials and methods:** This was a retrospective study conducted in the 1st Clinic of Obstetrics and Gynecology, Cluj-Napoca in a 3-year period. One hundred and forty-two patients  $\geq 40$  years of age that delivered between 2010 and 2012 were included in the analysis.

**Results:** The frequency of deliveries after the age of 40 was 2.42% of all the deliveries. Eighty percent of nulliparous and 51.72% of multiparous women delivered by cesarean section. A significantly higher percentage of primiparous women delivered by cesarean section compared to secundiparous women ( $p = 0.0007$ ). Fetal weight was significantly higher in multiparous than in primiparous women in the CS group ( $p = 0.01$ ). No differences were observed between the Apgar scores according to the delivery mode or parity in the study group.

**Conclusion:** Delivery after 40 years of age is associated with an increased number of obstetrical interventions.

**Keywords:** Childbearing, Elder women, Vaginal birth, Cesarean section.

**Abbreviations:** CS: Cesarean section; 1p: Primiparous; 2p: Secundiparous; 3p: Tertiparous;  $>1p$ : Multiparous.

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## INTRODUCTION

In the past, childbearing in older women was extremely rare. Nowadays, becoming pregnant after the age of 40 years is more frequent due to increased life expectancy, availability of new and more effective treatment for chronic illness and the availability and higher effectiveness of fertility treatment.<sup>1</sup> Beyond the happiness brought by the appearance of a future child, pregnancy after the age of 40 is associated with higher rates of pregnancy-related complications.<sup>2</sup>

This topic has become more important both from a social and a medical point of view. The social trends (career, longer life expectancy, higher education) and the availability of effective contraceptive methods had encouraged women to delay the age of the first pregnancy towards the beginning of the fifth decades. It is expected that the numbers of women of advanced age that will enter the obstetric population will increase in the future.

The aim of the present study was to analyze the particularities of birth after 40 years of age. To our knowledge, no study on a Romanian population has been done so far.<sup>3,4</sup>

## MATERIALS AND METHODS

A retrospective study was performed by analyzing all births recorded in the files of the 1st Department of Obstetrics and Gynecology, Cluj-Napoca, Romania, between 1st January 2010 and 31st December 2012. The analysis included all pregnant women assisted during the delivery in this clinic. Statistical analysis was performed using Microsoft Excel and statistical package for the social sciences (SPSS). Data are presented as numbers and percentages. The differences between percentages were tested using z-score. The p-value  $< 0.05$  was considered as statistically significant.

## RESULTS

A total number of 142 pregnant women  $\geq 40$  years old at the time of delivery were included in the study. During the period of time considered for the analysis, the average frequency of delivery after 40 years was 2.42% of all deliveries assisted in the above mentioned service (2010—2.35%; 2011—2.65%; 2012—2.29%). No statistically significant differences were observed between the delivery rates after the age of 40 years compared to all deliveries (Table 1).

Patient age ranged between 40 and 47 years old, with an average of 41.22 years (2010—41.19; 2011—41.33; 2012

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**Table 1:** Z-test and p-values for the comparison between the delivery rates after 40 years of age during the study period

Years	Z-test	p-value
2010/2011	-0.5992	0.27425
2011/2012	0.693	0.2451
2010/2012	0.1276	0.44828

—41.14). The oldest patient gave birth to a healthy baby of 3000 gm by cesarean section at 37 gestational weeks. In this case the indication for termination of pregnancy was severe pre-eclampsia.

A statistically significant higher rate of cesarean sections was observed in the  $\geq 40$  years old group compared with  $< 40$  years old group (Table 2). The analysis of delivery route by parity is presented in Table 3; the frequency of cesarean section is significantly higher in primiparous than in multiparous women ( $p < 0.05$  for all). Of all women  $> 40$  years of age, 55 were primiparous, 51 were secundiparous and 36 were multiparous.

The indications for cesarean section in primiparous and in secundiparous women are presented in Figures 1 and 2.

The most frequent indication for primiparous women was prior fertility treatment (18.64%); in multiparous women the most frequent indication was prior intervention on the uterus (e.g. cesarean section—34.55%).

A statistically significant fetal weight increase with parity was observed only in the subgroup with cesarean section delivery (Table 4). No significant differences were observed in the subgroup with vaginal delivery or when data were analyzed together for both vaginal and cesarean section deliveries. Additionally, no differences were observed for the Apgar scores between subgroup, regardless of parity (Table 5).

## DISCUSSION

The analysis of childbearing in the past decades had clearly showed an ascending trend of giving birth after the age of 40 years.<sup>1</sup> Having a child is major event in everybody's life but delaying birth after the age of 40 years can lead to important risks for the future mother.

It was difficult for us to set the limit of so-called 'advanced maternal age' because of the conflicting data from the literature. In the past, the term defined any birth after the age of 35 years,<sup>5,6</sup> an age limit which in our opinion is no longer acceptable.

**Table 2:** The analysis of the mode of delivery in women  $> 40$  years old

	Birth under 40 years (no. of cases)	Birth after 40 years (no. of cases)	Total
Vaginal	3717	53	3770
Cesarean section	2003	89	2092
Total	5720	142	5862

$p < 0.05$  for differences between the number of cases with vaginal delivery and cesarean section in the two groups

**Table 3:** The analysis of the delivery mode by parity in women  $> 40$  years old

Parity	Mode of delivery		Total (no. of cases)	CS (%)
	Vaginal birth (no. of cases)	Cesarean section (CS) (no. of cases)		
1p	11	44	55	80.00
2p	21	30	51	58.82
3p	15	13	28	46.43
$> 3p$	6	2	8	25.00
$> 1p$	42	45	87	51.72
Comparison CS (%)		Z-score	p-value	
1p - 2p		-2.3729	0.01778	
1p - 3p		-3.1178	0.0018	
1p - $> 3p$		-3.2746	0.00108	
2p - 3p		-1.0581	0.28914	
2p - $> 3p$		-1.7853	0.07346	
3p - $> 3p$		-1.0842	0.28014	
1p - $> 1p$		-3.3937	0.0007	

1p: Primiparous; 2p: Secundiparous; 3p: Tertiparous; CS: Cesarean section  
%: Percentage

**Table 4:** Analysis of the newborn weight by parity and the route of delivery

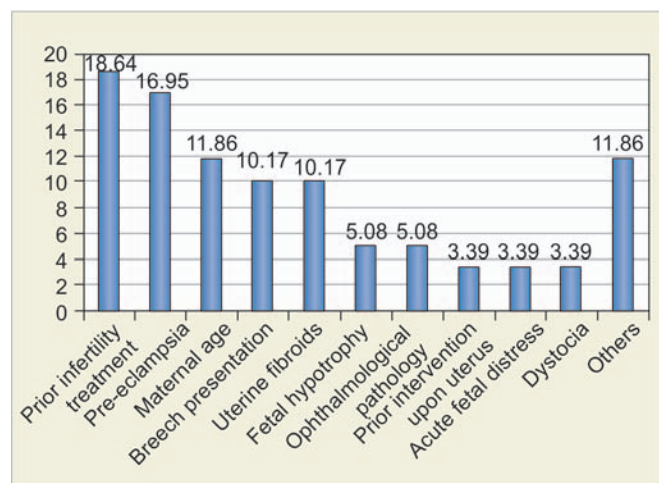
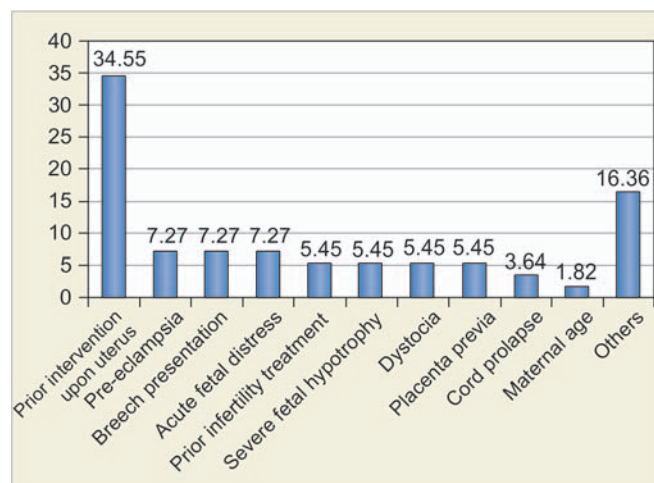
Delivery route	Newborn weight (gm)			
	1p	2p	>2p	≥2p
Vaginal	2918.18	3245.24	3099.52	3172.381
CS	2858.45	3228.97	3375.00	3278.75
Total	2870.85	3235.80	3214.31	3226.802
Comparison	p-value			
Vaginal	1p - 2p	0.2496		
	1p - 3p	0.6754		
	1p - ≥2p	0.3116		
	1p - ≥2p	0.3116		
CS	1p - 2p	0.0252		
	1p - 3p	0.034		
	1p - ≥2p	0.01		
	1p - ≥2p	0.01		
Vaginal/CS	1p - 2p	0.8216		
	1p - 3p	0.4651		
	1p - ≥2p	0.2543		

CS: Cesarean section

**Table 5:** Analysis of the newborn Apgar score at 1 minute taking into account parity and the route of delivery

	1p	2p	>2p	≥2p
Vaginal	8.36	9.14	8.52	8.83
CS	8.75	9.66	9.00	9.43
Total	8.67	9.44	8.72	9.14
Comparison	p-value			
Vaginal	1p - 2p	0.9124		
	1p - 3p	0.6101		
	1p - ≥2p	0.8469		
	1p - ≥2p	0.8469		
CS	1p - 2p	0.122		
	1p - 3p	0.3015		
	1p - ≥2p	0.0948		
	1p - ≥2p	0.0948		
Vaginal/CS	1p - 1p	0.7488		
	2p - 2p	0.8524		
	>2p - >2p	0.1997		
	≥2p - ≥2p	0.9486		

CS: Cesarean section

**Fig. 1:** Indications for cesarean section in primiparas (data are represented as percentages)**Fig. 2:** Indications for cesarean section in multiparas (data are represented as percentages)

The maximum age detected in our study group was 47 years old. We did not record any birth after the age of 50 years as reported in other studies.<sup>7</sup> The case of a Romanian women, considered in 2005 the oldest women who became a mother, it famous. She gave birth after sterility treatment and *in vitro* fertilization with both egg and sperm donor to her first baby at the age of 66 years and 320 days.<sup>8</sup> Her record surpassed in 2006 by a Spanish women, who delivered two healthy preterm twins by cesarean section at the age of 66 years and 358 days.<sup>9</sup> These two pregnancies were followed by serious debates involving both ethical and legal issues: in the former case, the patient declared to be 55 years old in order to get access to the *in vitro* fertilization procedure and died 2 years after the delivery because of ovarian cancer.<sup>10</sup>

The frequency of deliveries after the age of 40 years in our service was 2.42%, which is comparable to the frequency

reported in other studies from United States (2%)<sup>11</sup> and United Kingdom (3.13%).<sup>12</sup>

No statistically significant differences were observed between the frequencies of deliveries by elder women in the three year period. This result was expected due to the period of time considered in the study. A positive trend of the age of marriage, the age of mother at first birth and the average maternal age was observed in the past years.<sup>1,13</sup> In the United States, the mean age of mothers was 2.6 years higher in 2000 compared with 1970.<sup>1</sup> Additionally, during the same period, an increase of the mean age at first birth with 3.5 years and a positive trend of the percentage of women aged 35 or older at delivery was observed.<sup>1</sup> The report of the National Institute of Statistics of Romania on 40 years natality analysis (1960-2010) confirmed the existence of a similar trend in the Romanian population: increasing age at

first marriage with 3.4 years, delays in childbearing with a right displacement of the curve of the age of the mother at first child.<sup>13</sup>

Delivery after the age of 40 years is associated with high rates of operative procedures. In our study, we observed a significantly higher rate of cesarean sections when compared with women <40 years old (62% vs 35%,  $p < 0.0001$ ), the percentage being even higher for primiparous women (80%). No forceps or vacuum delivery was reported in the study group. These results were not a surprise due to the low rate of forceps or vacuum delivery in Romania, which is a consequence of the lack of acceptance of these procedures by the pregnant women and of the obstetrical training particularities of the physicians. These findings are in line with other studies reported in the literature.<sup>7</sup> A review<sup>7</sup> including 6978 patients aged between 20 and 29 years and 1,404 patients  $\geq 40$  years old at delivery showed a significantly higher risk of operative vaginal delivery in both nuliparas [OR = 2.4, CI 95% (1.9; 2.9)] and multiparas [OR = 1.5, CI 95% (1.2; 1.9)]  $\geq 40$  years old compared with women <40 years old and a significantly higher risk of delivering the baby by cesarean section also in both primiparas [OR = 3.1, CI 95% (2.6; 3.7)] and multiparas [OR = 3.3, CI 95% (2.6; 4.1)].<sup>7</sup> In a group of primiparous pregnant women from Israel with advanced maternal age, the percentage of cesarean sections was 92.4% for the subgroup aged 45 to 49 years and 100% for the subgroup aged 50 to 65 years.<sup>14</sup> In our study, we could not analyze this particular subgroup due to the small number of patients older than 45 years (3 patients).

A more stratified analysis showed a significantly higher risk for delivering by cesarean section for primiparous women compared to secundiparous ( $p = 0.017$ ) or multiparous women (0.0007), and also for secundiparous women compared with multiparous women ( $p = 0.07$ ).

The indications for cesarean sections were different between primiparous and multiparous women. In primiparous women, the more frequent indications were prior fertility treatment and severe pre-eclampsia. These findings are not a surprise; nulliparity represents a well-known risk factor for this pregnancy related condition [OR = 5.4, CI 95% (2.8; 10.3)].<sup>15</sup> Moreover, a pregnant patient 40 years or older has an increased risk for developing pre-eclampsia, the risk being higher in multiparous women compared with nulliparous women [OR = 1.68, CI 95% (1.23; 2.29)] for nuliparas and [OR = 1.96, CI 95% (1.34; 2.87)] for multiparas.<sup>15</sup>

In multiparous women, the major indication was prior intervention upon the uterus. The increased proportion of cases of multiparous women that had prior uterine surgery reflects the existing trend in our society of increasing rates of cesarean section in the first pregnancy that may lead to potential complications and a higher frequency of delivery

by cesarean section in this group during subsequent pregnancies.<sup>16</sup>

Interestingly, the percentage of cesarean sections due to dystocia or abnormal presentation did not differ between primiparous and multiparous women. We observed an increased percentage of cesarean section due to abnormal placentation (placenta previa): 5.45% for multiparous women compared with 1 for nulliparous women, multiparity representing an important risk factor for the occurrence of placenta previa.<sup>17</sup> Additionally, the maternal age of  $>35$  years itself is associated with an increased risk of placenta previa.<sup>18,19</sup>

Usually fetal weight increases with the parity. In our study this trend reached the level of statistical significance only in the subgroup with cesarean section. One possible explanation was brought by Khong TY et al.<sup>20</sup> who observed permanent anatomical changes in the spiral arteries after the first pregnancy. These changes may modify vascular remodeling during the next pregnancy with an increased debit through the uteroplacental arteries and higher fetal weight.<sup>20</sup>

Based on Apgar score, the children from cesarean sections and vaginal deliveries performed equally well, regardless of the parity in women. A previous study that enrolled 200 patients found a significantly higher frequency of the 5-minute Apgar score  $<7$  in the group of newborn from women older than 40 years compared with newborns from mothers 20 to 30 years old.<sup>21</sup> The differences are probably due the subjectivity of the Apgar score. Additionally, Apgar score relies only on several clinical parameters and its correlation with mortality and long-term morbidity is poor ( $p = 0.041$ ).<sup>22</sup>

The present study, even if it was performed retrospectively, represents a first analysis in our population and has important implications for both future mothers and healthcare practitioners. Future prospective studies are needed for a correct evaluation of outcome of birth after the age of 40 years. We also aimed to emphasize that a particular attention has to be given to this category of patients that will probably grow in the future years.

## CONCLUSION

The frequency of the deliveries in women  $>40$  years old was similar to that reported in the literature. Delivery after 40 years of age was associated with an increased number of obstetrical interventions. While in primiparous women, the most frequent indication for cesarean section was prior sterility treatment, in multiparous women prior uterine surgery lead to cesarean section more frequently. The first evaluation of the newborn, the Apgar score at 1 minute, was not significantly different between primiparous and multiparous women regardless the delivery route. The fetal weight was significantly higher in secundiparous or multiparous women compared to primiparous women that delivered by cesarean section.



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