

# Obstetric and perinatal outcomes of teenage pregnant women: a retrospective study

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## ABSTRACT

**BACKGROUND:** teenage pregnancy is a worldwide social problem. The aim of this study is to provide more data for a better understanding of the possible maternal and foetal risks associated with teenage pregnancies.

**METHODS:** the hospital records of all pregnant women, aged between 14 and 19, from the obstetric registers of the Policlinico Umberto I Hospital in Rome, between 2000 and 2010, have been completely reviewed (n=184). For each pregnant woman socio-demographic characteristics, obstetric history, pregnancy and birth outcomes were also determined. Our results were compared with a control group composed of 150 primigravida adult women aged 20-29 years who delivered at the Policlinico Umberto I Hospital in Rome in the same period.

**RESULTS:** the mean age  $\pm$  SD of the study group was  $17.9 \pm 1.2$ , while that of the control group was  $25.4 \pm 2.4$ . The control group had a significantly lower risk of preterm delivery ( $p=0.000$ ). The rate of low birth weight babies born to the young mothers was significantly higher than that of babies born to the adult mothers ( $p=0.036$ ). The study group had a lower risk of instrumental delivery and a higher proportion of spontaneous delivery ( $p=0.000$ ). Finally, we observed a statistically significant difference of the APGAR score at the fifth minute between the two groups ( $p=0.004$ ).

**CONCLUSIONS:** our results seemed to confirm the outcomes of previous studies for adolescent pregnant women, mainly regarding the increased risks of preterm deliveries and low birth weight babies, the higher incidence of spontaneous vaginal delivery and the lower incidence of instrumental delivery.

*Key words:* Teenage pregnancy; Obstetric outcomes; Pregnancy outcomes

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## INTRODUCTION

In the last twenty years, in Italy, the age of first intercourse for girls has decreased gradually to around 16 years [1, 2]. Early sexual intercourse increases the risk of teenage pregnancy.

Teenage pregnancy is a worldwide social problem: an estimated 16 million girls between the ages of 15 and 19 give birth every

year, with 95% of these births occurring in developing countries. This number represents 11% of all births worldwide. Seven countries account for half of all adolescent births: India, Bangladesh, Brazil, the Democratic Republic of the Congo, Ethiopia, Nigeria and the United States of America [3].

The role of teenage pregnancy regarding the possible risks for mothers and their babies

is not well defined. Several studies found that teenage mothers had a lower incidence of Caesarean section [4-6, 8-15] and delivery using instruments [5, 6, 10, 11, 13], a lower risk of gestational diabetes mellitus [4-7], a significantly higher risk of preterm labour [4-6, 9, 10, 13, 15] and low birth weight [4-6, 10-16].

The aim of this study is to provide more data for a better understanding of the possible maternal and foetal risks associated with teenage pregnancies regarding a control group of adult pregnant women.

## METHODS

The hospital records of all pregnant women, aged between 14 and 19, taken from the obstetric registers of the Policlinico Umberto I Hospital in Rome, between 2000 and 2010, have been completely reviewed.

For each pregnant woman the following information was collected: the year of delivery, the country of birth, the maternal age, the obstetrical code (previous full-term deliveries, previous preterm deliveries, previous miscarriages/voluntary terminations of pregnancy, living children), the pregnancy outcome (live births, miscarriages/intrauterine foetal deaths), the plurality, the gestational age, the birth weight, the type of labour (with or without analgesia), the type of delivery (spontaneous vaginal delivery, Caesarean section, delivery using instruments), the foetal presentation (cephalic, podalic), the aspect of amniotic fluid (clear, meconium-stained), the APGAR score at the first and fifth minute, maternal and foetal diseases.

The data relating to childbirth and the baby (the type of labour, the foetal presentation, the aspect of amniotic fluid, the type of delivery, the birth weight and the APGAR score at the first and fifth minute) were missing in the pregnancy which ended in miscarriage. Also the gestational age, birth weight, foetal presentation and APGAR score at the first and fifth minute were calculated only for the live births, excluding the miscarriage and the three intrauterine foetal deaths.

Our results were compared with a control group composed of 150 primigravida adult women aged between 20-29 who delivered at the Policlinico Umberto I Hospital in Rome, between 2000 and 2010. The age between

20 and 29 years was considered because this age-group is generally regarded as safe for childbirth. The collected variables for the adult pregnant women were: the age, the country of birth, the gestational age, the birth weight, the type of delivery and the APGAR score at the fifth minute.

A descriptive analysis was conducted to show the characteristics of the pregnant teenage women. Change over time was analyzed using the Cochran-Armitage test that tests for trends in binomial proportions as described by Agresti [17]. A Wilcoxon rank sum test was used to calculate statistical differences in gestational age at delivery between healthy women and women suffering from oligohydramnios and statistical differences in gestational age at delivery between healthy women and women suffering from the premature rupture of membranes (PROM). The Chi-square and Fisher's exact tests were used to analyze the categorical data of the two groups. Statistical analyses were done using Stata software, version 11.0.

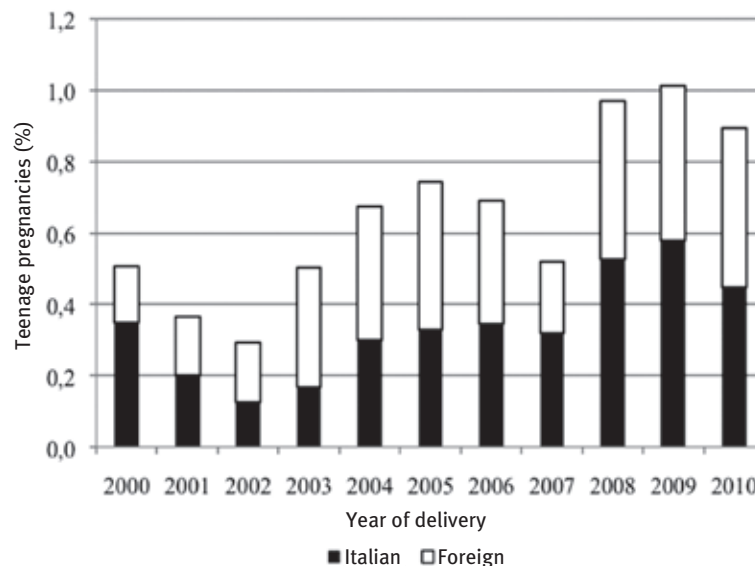
The study protocol was approved by the Ethics Committee of the Policlinico Umberto I Hospital in Rome, in accordance with the Declaration of Helsinki.

## RESULTS

Teenage pregnancies, selected from the obstetric registers (2000-2010) of the Policlinico Umberto I Hospital in Rome, according to the criteria mentioned above, were 184 (95 Italian and 89 foreign), out of a total of 27 923 pregnancies. For each year we calculated the ratio of teenage pregnancies in the total of pregnancies. Overall, the proportion of teenage pregnancies tended to increase over the study period, from 0.5 in 2000 to 0.9 per 100 pregnancies in 2010 ( $p < 0.001$ ) (Figure 1).

As far as socio-demographic characteristics of selected pregnant adolescents are concerned, we observed that the majority of them were between 17 and 19 years old (mean age  $\pm$  SD =  $17.9 \pm 1.2$ ): 37 adolescents were 17 years old, 46 were 18 years old and 78 were 19 years old. The number of Italian pregnant teenagers ( $n=95$ ; 51.6%) was very similar to that of foreign ones ( $n=89$ ; 48.4%). The majority of foreign pregnant women were Romanian. Foreign pregnancies tended to increase over the study period, from 0.2 in 2000 to 0.4 per

FIGURE 1

**PERCENTAGE OF TEENAGE PREGNANCIES PER YEAR FROM 2000 TO 2010,  
WITH RESPECT TO TOTAL ANNUAL PREGNANCIES**


100 pregnancies in 2010 (Figure 1). Our control group was composed of 86 Italians and 64 foreigners. Also, in this case, the majority of foreign pregnant women were Romanian. There was not a statistically significant difference for the country of birth between the two groups ( $p=0.086$ ). The maximum number of adult mothers (aged 20-29) belonged to the 25-27 age-group (approximately 46%). Their mean age ( $\pm$ SD) was  $25.4 \pm 2.4$  years.

Out of the total adolescent pregnancies, 39 (21.7%) preterm deliveries (gestational age < 37 weeks), 137 (76.1%) full-term deliveries (gestational age: 37-41 weeks) and 4 (2.2%) post-term deliveries (gestational age  $\geq$  42 weeks) occurred. The control group had a significantly lower risk of preterm delivery ( $p=0.000$ ).

In the study group the birth weight was normal ( $\geq$  2 500 g) for 153 babies (83.6%) and 30 babies (16.4%) were underweight (< 2 500 g). The birth weight of the preterm infants varied from 1 170g to 3 675 g (mean weight 2 397 g) and that of the full-term from 2 230 g to 4 440 g (mean weight 3 256 g). In the control group the birth weight was normal for 137 babies (91.3%) whereas 13 babies (8.7%) were underweight. Thus, we noticed that the rate of low birth weight babies born to the young mothers was significantly higher than that of babies born to the adult mothers ( $p=0.036$ ).

With regard to the type of delivery, 121

adolescents (66.1%) gave birth spontaneously, 59 (32.2%) had a Caesarean delivery (elective: 84.7%; emergency: 15.3%) while 3 (1.6%) needed the aid of instruments (vacuum extractor). The main indications for emergency Caesarean section were: pre-eclampsia (3 cases), placental abruption (4 cases) and foetal pain (2 cases). In the control group we observed 70 (46.7%) spontaneous vaginal deliveries, 61 (40.7%) Caesarean sections and 19 (12.7%) deliveries using instruments. The study group had a lower risk of instrumental delivery and a higher proportion of spontaneous delivery ( $p=0.000$ ).

The majority of the newborns in the study group presented a normal APGAR score at the first and fifth minute after birth (index of wellbeing of the baby): the APGAR score at the first minute  $\geq$ 7 for 170 babies (94.4%); the APGAR score at the fifth minute  $\geq$ 7 for 178 babies (98.9%). In the control group we observed the APGAR score at the fifth minute  $\geq$ 7 for 139 babies (92.7%) ( $p=0.004$ ).

The socio-demographic characteristics, pregnancy and birth outcomes in the study group and in the control group are summarized in Table 1.

With regard to the obstetric history and other pregnancy outcomes of the study group (Table 2), we noted that 158 adolescents were primipara and 26 adolescents were multipara. Out of the latter group, 17 were secondipara

TABLE 1

SOCIO-DEMOGRAPHIC CHARACTERISTICS, PREGNANCY AND BIRTH OUTCOMES IN THE STUDY GROUP AND IN THE CONTROL GROUP					
CHARACTERISTICS	STUDY GROUP (n=184)		CONTROL GROUP (n=150)		p VALUE
Age (mean value $\pm$ SD)	17.9 $\pm$ 1.2		25.4 $\pm$ 2.4		
<b>COUNTRY OF BIRTH</b>					
Italy	95	51.6	86	57.3	p=0.086
Romania	41	22.3	31	20.7	
Ex Yugoslavia	15	8.2	3	2	
Other	33	17.9	30	20	
<b>GESTATIONAL AGE</b>					
<37	39	21.7	4	2.7	p=0.000
37-41	137	76.1	139	92.7	
$\geq$ 42	4	2.2	7	4.7	
<b>BIRTH WEIGHT</b>					
<2500 g	30	16.4	13	8.7	p=0.036
$\geq$ 2500 g	153	83.6	137	91.3	
<b>TYPE OF DELIVERY</b>					
Spontaneous vaginal delivery	121	66.1	70	46.7	p=0.000
Caesarean section	59	32.2	61	40.7	
elective	50	84.7	n.a.*	n.a.*	
emergency	9	15.3	n.a.*	n.a.*	
Delivery using instruments	3	1.6	19	12.7	
<b>APGAR SCORE AT THE FIFTH MINUTE</b>					
<7	2	1.1	11	7.3	p=0.004
$\geq$ 7	178	98.9	139	92.7	

\* Not available

and 9 terzipara or more. Only 2 pregnant women had had a previous preterm delivery (gestational age <37 weeks). All previous pregnancies corresponded to living children. 158 pregnant adolescents did not have previous miscarriages/voluntary terminations of pregnancy, 23 had one experience either of miscarriage or voluntary termination of pregnancy and 3 experienced two or more episodes of these events. 180 adolescent pregnancies (97.8%) ended successfully, 3 were intrauterine foetal deaths (IUFD) and one was a miscarriage. There were 181 singleton pregnancies (98.4%) and 3 twin pregnancies

(1.6%). The labour was without analgesia for 102 (55.7%) and with analgesia for 81 adolescent pregnant women (44.3%). In the adolescent group the foetal presentation was cephalic in 175 cases and podalic in 4 cases, while the aspect of the amniotic fluid was clear in 158 cases and meconium stained in 27 cases.

Premature rupture of membranes (PROM) and oligohydramnios were the most common diseases among teenage pregnant women (Table 3), while intrauterine growth restriction (IUGR) and foetal pain were the most common foetal diseases (Table 4). Oligohydramnios was observed in 12 adolescents and premature rupture of membranes

TABLE 2

OBSTETRIC HISTORY AND OTHER PREGNANCY OUTCOMES OF THE STUDY GROUP		
CHARACTERISTICS	<i>n</i>	%
<b>PREVIOUS FULL-TERM DELIVERIES</b>		
0	158	85.9
1	17	9.2
2 or more	9	4.09
<b>PREVIOUS PRETERM DELIVERIES</b>		
0	182	98.9
1	2	1.1
<b>PREVIOUS SPONTANEOUS ABORTIONS/ VOLUNTARY TERMINATIONS OF PREGNANCY</b>		
0	158	85.9
1	23	12.5
2 or more	3	1.6
<b>LIVING CHILDREN</b>		
0	156	84.8
1	20	10.9
2 or more	8	4.3
<b>OUTCOME</b>		
Live births	180	97.8
Miscarriage/intrauterine foetal death	4	2.2
<b>PLURALITY</b>		
Singleton	181	98.4
Twin	3	1.6
<b>FOETAL PRESENTATION</b>		
Cephalic	175	95.6
Podalic	8	4.4
<b>AMNIOTIC FLUID</b>		
Clear	158	85.4
Meconium stained	27	14.6
<b>TYPE OF LABOUR</b>		
Without analgesia	102	55.7
With analgesia	81	44.3

in 13 adolescents. The average gestational age was not significantly different between healthy women and women suffering from oligohydramnios ( $p=0.06$ ) and between healthy women and women suffering from PROM ( $p=0.49$ ).

## DISCUSSION

According to Eurostat data (Demographic outlook 2010) [18], the estimated mean childbearing age in Italy rose to 31.3 years (in

TABLE 3

MATERNAL DISEASES AMONG TEENAGE PREGNANT WOMEN		
MATERNAL DISEASE	<i>n</i>	%
PROM	13	7.1
Oligohydramnios	12	6.5
Placental abruption	4	2.2
Anhydramnios	3	1.6
Gestational hypertension	3	1.6
Pre-eclampsia	3	1.6
CPD	3	1.6
Placenta previa	1	0.5
Polyhydramnios	1	0.5

PROM = premature rupture of membranes

CPD = cephalo-pelvic disproportion

TABLE 4

FOETAL DISEASES		
FOETAL DISEASE	<i>n</i>	%
IUGR	4	2.2
Foetal pain	2	1.1
Gastroschisis	1	0.5
Foetal macrosomia	1	0.5
Omphalocele	1	0.5

IUGR = intrauterine growth restriction

2010), an increase of about four years since 1979, when it was at its minimum (27.4). The process of postponement of fertility is still underway, as part of a more general delay in the transition to adult life. On the other hand, as has already been noted, teenage pregnancy is an important current social problem. In our study it represented 0.7% of the total number of pregnancies in the years 2000-2010. Regarding the same period, Eurostat data for pregnant women aged between 10 and 19 years in Italy gave a value of 1.75%. This different percentage was probably obtained due to the fact that our study did not consider regions with a higher percentage of teenage pregnancies (Sicily, Campania and Puglia) [18].

In our sample both Italian and foreign teenage pregnancies were 0.3% of the total number of

pregnancies. As our study was carried out in an Italian hospital, we expected a higher percentage of Italian teenage pregnancies rather than foreign ones. This same percentage was probably due to the increasing number of foreigners in Italy and their low socio-economic conditions.

The results of this study confirmed that teenage mothers had a significantly higher incidence of spontaneous vaginal delivery, while the incidence of instrumental delivery was lower [4-6, 8-15]. The better predisposition of teenage pregnant women to have a spontaneous vaginal delivery is due to better myometrial function, greater connective tissue elasticity and lower cervical compliance [20]; also the incidence of low birth weight babies is higher [4-6, 10-16]. We assumed that the Caesarean delivery rate in adolescent women

in this study was quite high, and that the elective Caesarean section preference increased this mode of delivery.

The increased risk of preterm deliveries in the young mothers was congruent with the literature [4-6, 9, 10, 13, 15].

Different previous studies affirmed that teenage pregnancies were associated with a higher risk of low birth weight [4-6, 10-16]. Our study confirmed these results. The higher incidence of low birth weight is probably a reflection of the preterm delivery. Also, anatomic immaturity and continued maternal growth may represent biologic growth barriers for the foetus [21].

The statistically significant difference of the APGAR score at the fifth minute between the study group and the control group was not supported by other previous studies.

In conclusion, our results seemed to confirm the outcomes of the mentioned studies for the adolescent pregnant women, mainly regarding the increased risks of preterm deliveries and low birth weight babies, the higher incidence of spontaneous vaginal delivery and the lower incidence of instrumental delivery. Other important consequences of teenage pregnancy have been reported in previous studies: post neonatal mortality [22, 23], premature death of young mothers [24], unemployment and poverty [25]. Postnatal contraception should be encouraged to avoid further pregnancies leading to financial and emotional stability. Greater importance should be given to sex education and contraception to avoid unwanted teenage pregnancies.

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