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Comparison of Infants of Adolescent and Advanced Age Mothers in Spontaneous Vaginal Deliveries Occured between 2003 and 2013

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ABSTRACT

Introduction: This study aims to compare obstetric results of pregnancies in adolescents and advanced age mothers, which is a significant Mother-Child health problem in developing countries.

Methods: This retrospective study included mothers and infants, over a 10-year period, with babies born at full-term by spontaneous vaginal birth to adolescent mothers who were 18 years and younger, and to mothers who were 40 years and older. Both groups were investigated for abnormalities, gender, height, weight, head circumference and birth weight of newborns.

Results: Over the 10-year period from 1 March 2003 to 31 March 2013, there were a total of 29981 normal spontaneous vaginal deliveries. 818 pregnant women aged 18 years and younger(2.73%) and 972 pregnant women aged 40 years and older(3.23%) were determined. When the abnormalities and stillbirth rates of newborns are examined, there was no statistically significant difference identified between the two groups. There was statistically significant difference found between height-birth weight-head circumference of infants of advanced age mothers and adolescent mothers. In both groups when the SGA(<2500 g) and LGA(>4000 g) infants are compared, SGA infants were observed to be significantly higher for adolescent mothers, while LGA infants were found to be significantly higher for advanced age mothers. When the correlation between mothers age and birth weight was investigated, it was observed that infants of advanced age mothers were heavier, while infants born to adolescent mothers had lower birth weights.

Conclusion: This study showed that adolescent and advanced age pregnancies form high risk groups. In both groups to improve pregnancy results, social support, education and regular monitoring should be provided.

INTRODUCTION

According to the definition of the World Health Organization (WHO), the adolescent period is the transition physically and mentally from childhood to adulthood in the age interval 10-19 years.[1] Adolescent pregnancy is used for pregnancy in women within this age interval. Adolescents form 30% of the global population and 90% live in developing countries. Each year nearly 16 million newborns are born to adolescent mothers globally.[2]

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According to 2013 Turkish Demographic and Health Survey (TDHS) data, 5% of adolescent women have given birth. At this age 3% of women had given live birth, while 1% were pregnant with their first child at the time of the research.[3] In 2008 the adolescent pregnancy rate was 6% according to the TDHS, which appeared to regress to 5% according to 2013 TDHS results. Additionally becoming a parent is more common in those living in rural areas (6%) compared to those in urban areas (4%), with differences between regions (west 3%, South Central and Eastern regions 6% and above).[3,4]

The adolescent age group comprises 16.1% of the population in Turkey. Of adolescents aged 15-19 years 7.1% are married.[5]

Adolescent pregnancies are accepted as having more risk compared to other pregnancies. Socioeconomic

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and psychological factors such as low economic levels, insufficient nutrition, maternal biological immaturity, unwanted pregnancy, educational level, emotional stress and suboptimal perinatal care cause bad obstetric and neonatal results in adolescent pregnancies.[6]

One of the effective factors on fertile behavior is the age of first marriage and maternal age at first birth. Together with differences between rural-urban areas and regions, there is a steady increase in the age of the mother at first birth in Turkey.[3,5]

The continuing demographic transformation process in Turkey is rapidly reducing the population in young age groups and increasing the share of the population in advanced age groups.

According to 2015 data from the Turkish Statistical Institute the elderly population forms 8.2% of the total population and this is expected to reach 10% by 2023.[7] This demographic age change occurring in the general population occurs at different times in rural-urban areas and regions and is expected to increase the number of pregnancies at older ages.

Advanced age pregnancies are accepted as pregnancies of women aged 35 years and above. Advanced age pregnancies, especially those aged 40 years and above, are in the high risk pregnancy category. Due to social and economic reasons such as the rise in a woman's age at first marriage in developed countries especially, career aims, increase in educational levels and social status, social empowerment of women and increase in the use of assisted reproductive techniques, pregnancy and birth plans are delayed and advanced age pregnancies are more commonly encountered.[8] In developing societies, due to lack of, or insufficient, application of family planning methods, advanced age pregnancies are frequently encountered. According to TDHS 2013 data, the incidence of advanced age mothers is 8.6% in Turkey.[3] Other studies in Turkey have found the incidence of pregnancy in women aged 35 and above varied in different regions from 7.8-10.7%.[9]

Advanced age has negative effects on fertility and fecundity, maternal and perinatal mortality and morbidity. Systemic diseases such as hypertension and diabetes, high miscarriage rates, chromosome abnormalities, placental pathologies, and increased operative birth rates may be listed among risk factors.[8,9]

The aim of our study was to compare obstetric results from spontaneous vaginal births by adolescents (18 years and younger) and advanced aged (40 years and above) mothers over a 10 year period.

METHODS

This retrospective cross-sectional type study was completed at the State Hospital Obstetrics and Gynecology clinics in Viranşehir county in Şanlıurfa province in the southeast region of Turkey. The study included mothers and infants over a 10 year period from 1 March 2003 to 31 March 2013 with infants born at term by spontaneous vaginal delivery to adolescent mothers who were 18 years and younger, and to mothers who were 40 years and older. Both groups were investigated for abnormalities, gender, height, weight, head circumference and birth weight of newborns. The babies were born at term according to their mothers' last menstrual periods or early ultrasonographic measurements. The newborn nurses used the electronic weighing instruments for measuring weights and fabric measuring tape for measuring length and head circumference. The study has ethical consent and ethical approval. To present descriptive data frequency, percentage, mean and standard deviation statistics are used. To compare categorical variables between the two groups, the chi-square test was used. For comparison of quantitative variables the Independent Samples T test was used. The value $p<0.05$ was accepted as statistically significant.

RESULTS

Over the 10-year period from 1 March 2003 to 31 March 2013, there were a total of 29981 spontaneous vaginal term deliveries, with 818 born to mothers aged 18 years and younger (19 year olds were not included in the study) (2.73%) and 972 born to mothers aged 40 years and older (including 40 year olds) (3.23%). The youngest maternal age was 12 with the oldest maternal age 61 years. The mean age of mothers aged 18 years and younger was 17.09±1.12 years and the mean age of mothers aged 40 years and older was 42.92±2.95 years. When parity is evaluated, the highest parity in mothers aged 18 years and younger was 5, while the highest parity for mothers aged 40 years and older was 18. The mean parity in the first group was 1.35±0.62, while this value was 7.5±2.67 in the second group.

When the abnormalities and stillbirth rates of newborns are examined, there was no statistically significant difference identified between the two groups (Table 1).

Of mothers aged 18 years and younger 50.9% (n=416) gave birth to female newborns, while this rate was 48.8% (n=474) in mothers aged 40 years and older. In terms of gender of the newborns, there was no statistically significant difference between the two groups (p=0.378, chi-square=0.776). There was a statistically significant difference found between height-birth weight-head circumference of newborns in the two groups (Table 2) (Figure 1).

In both groups when the SGA (<2500g), LGA (>4000g) and AGA of infants are compared, the difference between the two groups was observed to be statistically significant (Table 3).

When the correlation between maternal age and birth weight was investigated, with chi-square analysis, it was observed that infants of advanced age mothers were heavier, while born to mothers aged 18 years or less had lower birth weights (p<0.01) (Table 4) (Figure 2).

Table 1: Abnormalities and stillbirth rates of new born

Abnormalities	Adolescent mothers		Advanced aged mothers		Ki-kare	p
	n	%	N	%		
Anencephaly	1	0.1	3	0.3	-	>0.05
Down syndrom	1	0.1	1	0.1		
Hydrocephaly	0	0.0	1	0.1		
Encephalocele	0	0.0	1	0.1		
SpinaBifida	0	0.0	1	0.1		
Twins	0	0.0	1	0.1		
Stillbirths	5	0.6	8	0.8	0.276	

Table 2: Comparison of high-risk pregnancies in terms of anthropometric and obstetric characteristics

	Mean±standard deviation		p*
	Adolescent mothers (n=818)	Advanced aged mothes (n=972)	
Height	49.91±2.42	50.57±2.11	0.0001
Birth weight	3173.95±490.52	3469.18±573.55	0.0001
Head circumference	33.10±1.35	33.46±1.32	0.0001
Maternal age	17.09±1.12	42.92±2.95	0.0001
Parity	1.35±0.62	7.50±2.67	0.0001

*Independent student T test

Table 3: Comparison of high-risk pregnancies in terms of birth weight

Birth weight	Mothers aged 18 years and under (n=818)		Mothers aged 40 years and over (n=972)		Chi-square	p
	n	%	n	%		
SGA (<2500 g)	56	6.8	39	4.0	81.887	0.0001
AGA (2500-4000 g)	728	89.0	763	78.5		
LGA (4000 gandover)	34	4.2	170	17.5		

Table 4: Comparison of high-risk pregnancies in terms of mean birth weight

Birth weight (g)	Mean±SD		p*
	Adolescent mothers (n=818)	Advanced aged mothers (n=972)	
SGA	2121.64±443.83	2114.58±388.25	0.930
AGA	3241.93±335.51	3405.06±359.49	<0.001
LGA	4265.79±243.27	4383.54±307.70	0.113

*Independent samples T test

When the birth weights of female newborns are investigated, in adolescent mothers the rate of newborn with low birth weight was found to be statistically significantly higher than those born to mothers aged 40 years and older (62.5% vs. 37.5% p<0.001). When the birth weight of male newborns are examined, the rate of heavy infants born to mothers aged 40 years and older was higher by a statistically significant level compared to adolescent mothers (86.7% vs. 13.3%, p<0.001) (Table 5).

When the gender of SGA and LGA infants are compared, there was no statistically significant difference identified in terms of gender (Table 6).

DISCUSSION

Advanced age pregnancies and adolescent pregnancies are accepted as having high maternal, perinatal and neonatal risks. Adolescents comprise 30% of the global population and 90% live in developing countries. Sixteen million adolescent girls in the 15-19 year age group give birth each year, with these births forming 11% of global births and 95% are in developing countries.[2,10]

According to 2013 data from the Turkish Demographic and Health Survey (TDHS), 16.1% of the country's population is in the adolescent age group, with 7.1% of 15-19 year

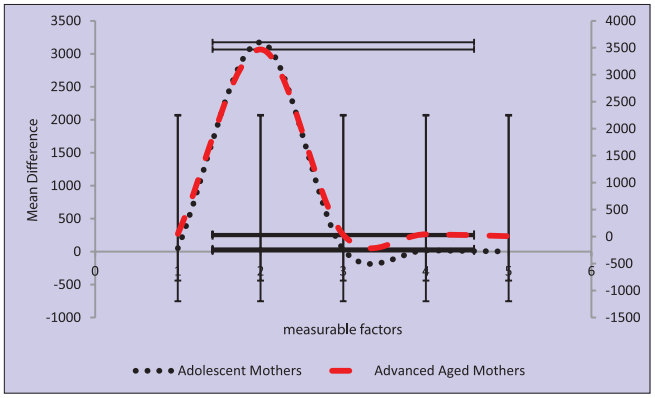

Figure 1: Comparison of high-risk pregnancies in terms of anthropometric and obstetric characteristics

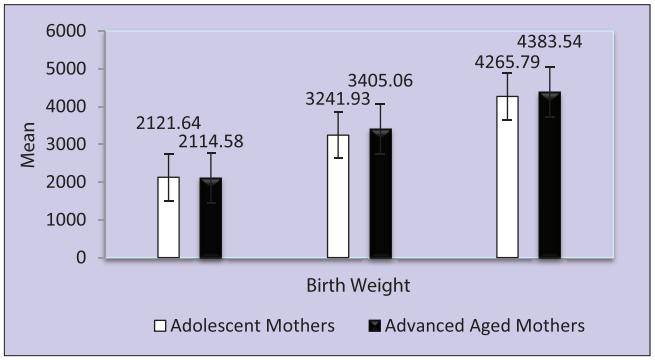

Figure 2: Comparison of high-risk pregnancies in terms of mean birth weight

Table 5: Comparison of groups in terms of birth weight and gender

	n (%)		p*
	Adolescent mothers (n=86)	Advanced aged mothers (n=175)	
Female			
SGA	40 (62.5)	24 (37.5)	<0.001
LGA	6 (12.5)	42 (87.5)	
Total	46 (41.1)	66 (58.9)	
Male			
SGA	27 (52.9)	24 (47.1)	<0.001
LGA	13 (13.3)	85 (86.7)	
Total	40 (26.8)	109 (73.2)	

*Chi-square test

Table 6: Comparison of SGA and LGA infants according to gender

	n (%)		p*
	Adolescent mothers (n=86)	Advanced aged mothers (n=175)	
SGA			
Female	40 (62.5)	24 (37.5)	0.200
Male	27 (52.9)	24 (47.1)	
Total	67 (58.3)	48 (41.7)	
LGA			
Female	6 (12.5)	42 (87.5)	0.500
Male	13 (13.3)	85 (86.7)	
Total	19 (13.0)	127 (87.0)	

*Chi-square test

old adolescents married and a rapid increase in the age of motherhood. Childbirth before 17 years is rare, however 16% of 19-year old women are mothers or pregnant with their first child. When these results are compared with TDHS 2008 results, there appears to be a fall in adolescents becoming parents in the early period. This rate was 6% in TDHS 2008 results and regressed to 5% in TDHS 2013 data.[3,4]

In our study the rate of adolescent pregnancies among 29981 spontaneous vaginal births was 2.73% (818 pregnancies). This rate is lower than the literature which we link to the increased amount of cesarean and operative births in adolescents. In 2 studies in Turkey, adolescent pregnancies were reported as 1.3% and 2.9%, and these rates are considered to be linked to regional differences.[11,12] We identified the rate of pregnancies in women aged 40 years and above as 3.23% (972 pregnancies). Globally and in our country these rates vary from 4.3-11.6%, due to differences in age of marriage, educational level and socioeconomic differences between large cities and rural regions.[13,14] In this study adolescent pregnancies were mainly nullipar, in accordance with the literature, while advanced age pregnancies were multipar.

When the abnormalities and stillbirth rate of infants is examined, there was no statistically significant difference identified between the two groups. It is known that advanced age pregnancy may cause increased anomaly rates and perinatal mortality.[15] However, currently anomalies are identified in the early weeks of pregnancy leading to a reduction in the rate of live born babies with abnormalities. In adolescent pregnancies, stillbirth, preterm birth and intrauterine growth retardation are more common.[16] We did not find a statistically significant difference between the two groups in terms of stillbirth in the study.

It was found that the birth weight, height and head circumference of newborns of the adolescent age group were significantly lower than newborns of mothers aged 40 years or older. Maternal age had significant effects on length and head circumference of the neonates.[17] There was a statistically significant difference found in our study between length and head circumference of newborns in the two groups in accordance with the literature. When the correlation between maternal age and birth weight is investigated, we observed that advanced age mothers had heavier newborns, while mothers aged 18 years or younger had newborns with lower birth weight ($p<0.01$).

When the birth weights of female newborns are investigated, in adolescent mothers the rate of newborns born with low birth weight was found to be statistically significantly higher than those born to mothers aged 40 years and older ($p<0.001$). When the birth weight of male newborns are examined, the rate of heavy infants born to mothers aged 40 years and older was higher by a statistically significant level compared to adolescent mothers ($p<0.001$). Studies in Turkey have found that the mean birth weight of male newborns is higher than for female newborns.[17]

In accordance with the literature, we identified the rate of SGA (<2500 g) was significantly higher in adolescent prengancies. When we compared SGA and LGA infants in terms of gender, we did not find any difference.[16] Factors may include the fact that the adolescent body has not fully developed, low body weight before pregnancy, insufficient weight gain during pregnancy, low socio-economic level, educational level, anemia and insufficient prenatal care. Many studies have identified a correlation between pregnancies at adolescent age and low birth weight of the fetus.[18] A study in Turkey found that the birth weight of babies born to adolescent mothers was significantly low compared to a control group.[19]

Studies of advanced age pregnancies have shown that the LGA (>4000 g) rate is high.[20] Similarly an effect has been shown between maternal age and parity and newborn birth weight.[21] In our study the LGA rate in pregnancies aged 40 years and above was statistically significantly high compared to adolescent pregnancies.

In advanced age pregnancies a high rate of perinatal and neonatal complications may occur.[22] Similarly in adolescent pregnancies, there is an increase observed in perinatal morbidity and mortality linked to increased maternal complications.[23]

CONCLUSION

Adolescent age and advanced age pregnancies form two high risk groups. In both groups to improve pregnancy results, social support, education and regular monitoring should be ensured, with improvements in maternal and fetal results targeted. Within reproductive health care, prenatal and postnatal care services should be equivalent and accessible to everyone, especially in rural areas, and sustainable monitoring will be beneficial.

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