Original Article
ISSN (Online): 2350-0530
ISSN (Print): 2394-3629

International Journal of Research - GRANTHAALAYAH
June 2022 10(6), 78-84

ARE ADVERSE NEONATAL OUTCOMES MORE FREQUENT IN ADOLESCENT PREGNANCIES?

Paula Andréia Araújo Monteiro [1], Francisco Plácido Nogueira Arcanjo [1,2,3] ✉, Filipe Nobre Chaves [2], Luiz Odorico Monteiro de Andrade [3,4], Ivana Cristina de Holanda Cunha Barreto [4], Thiago Corrêa de Oliveira [3,5], Maria Gabriella Adeodato Prado [1], Cecília Costa Arcanjo Freire [1,3,5], Caio Plácido Costa Arcanjo [2,5], Júlio César Chagas e Cavalcante [3,5], Maria Aparecida Zanetti Passos [6], Eliana Pereira Vellozo [7]

[1] Postgraduate Program in Family Health, Universidade Federal do Ceará, Sobral, Brazil
[2] Postgraduate Program in Health Sciences, Universidade Federal do Ceará, Sobral, Brazil
[3] Faculty of Medicine, Universidade Federal do Ceará, Sobral, Brazil
[4] Researcher at the Osvaldo Cruz Foundation, Ceará, Brazil
[5] Centro Universitário INTA, Sobral, Ceará, Brazil
[6] Postgraduate Program in Education and Health in Childhood and Adolescence, Universidade Federal de São Paulo / Escola Paulista de Medicina, São Paulo, Brazil
[7] Postdoctoral students in Pediatrics and Sciences Applied to Pediatrics at the Universidade Federal de São Paulo. Outpatient Supervisor of the Adolescent Medicine Sector, Department of Pediatrics, Universidade Federal de São Paulo. Co-advisor of the Postgraduate Program in Pathology at the Universidade Federal de São Paulo, Brazil

Received 10 May 2022
Accepted 25 June 2022
Published 05 July 2022

Corresponding Author

Francisco Plácido Nogueira Arcanjo,
franciscoplacidoarcanjo@gmail.com

DOI
10.29121/granthaalayah.v10.i6.2022.4558

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

ABSTRACT

Background: Adolescent pregnancy is a complex issue since it has been associated to adverse fetal and maternal outcomes.
Method: This is a cross-sectional analytical study, having as a data source the medical records of pregnant women at a reference maternity hospital, located in the northeast of Brazil. Data was collected on maternal age, gestational age at delivery, birth weight, type of delivery, 1- and 5-minute Apgar scores less than 7, and fetal deaths. For the analysis of data, two groups were distinguished according to age: 1) girls aged 13-19 years old, and 2) women aged 20-34 years old.
Results: A total of 1642 pregnant women's medical records were included in this study, 28.1% belonged to adolescent mothers, and 71.9% to adult mothers. In the comparison between groups, there were significantly more cesarean deliveries to mothers aged 20-34 years (p<.001); and a significantly higher proportion of preterm deliveries in the group of adolescent mothers (p=.0239). The other study variables did not present statistical significance.
Conclusions: Adolescent mothers are at higher odds of preterm birth, and since this factor is associated short- and long-term adverse outcomes for the neonate, there is a need to prioritize this age group in prenatal care.

Keywords: Pregnancy in Adolescence; Pregnancy Complications; Cesarean Section; Premature Infant

1. INTRODUCTION

Adolescence is a fundamentally biological process of organic experiences, in which cognitive development and personality structuring are accelerated. It is the period between 10 and 19 years of age World Health Organization WHO (1993) which is marked by accelerated growth and development Rodrigues et al. (2005) and can be defined as early (10 to 14 years old) in which the growth spurt, the rapid increase in the secretion of several hormones and the appearance of secondary sexual characteristics occurs Dubuc and Ferrari (2009) and late adolescence (from 15 to 19 years old) which is characterized by a slowing down of these processes. In Brazil, a considerable portion of the population is composed of adolescents. Among the country's 190 million inhabitants, approximately 34 million are in their teens IBGE (2011)

In developing regions, it is estimated that 21 million adolescents aged 15-19 years become pregnant each year, and at least 777,000 births occur to girls under the age of 15 years Darroch et al. (2016) In Brazil, adolescent mothers accounted for more than 15% of all live births in 2018, of which more than 21,000 infants were born to mothers aged 10-14 years Saúde (2021)

Adolescent pregnancy has been associated with an increased frequency of adverse obstetric outcomes, such as low birth weight, preterm birth, maternal and perinatal death, preeclampsia, and cesarean delivery World Health Organization WHO (2016), Karataşlı et al. (2019) In a study conducted in Brazil, comparing pregnancy in adolescents and adults, Moura et al. (2011) reported that childbirth at an early age, especially below the age of 16 years, is associated with an increase in preterm births, low birth weight, intrauterine growth restriction, new-borns small for gestational age, premature rupture of membranes, anemia, preeclampsia, acute fetal distress, and increased incidence of cesarean sections.

Pregnancy, especially during adolescence age, is considered a major public health concern around the world due to its high prevalence, and association with serious physical, psychological and social repercussions Darroch et al. (2016), Moura et al. (2011), Chalem et al. (2007)

Given this and due to conflicting findings from different studies on this theme, the purpose of this study was to compare perinatal results among adolescent and adult mothers in a middle-sized city located in the northeast of Brazil.

2. MATERIALS AND METHODS

2.1. STUDY DESIGN AND SETTING

This is a cross-sectional analytical study, having as a data source the medical records of pregnant women at a reference hospital, located in the northeast of Brazil.

2.2. STUDY POPULATION

The sample consisted of a cohort of girls and women who gave birth to a single live infant at a reference maternity hospital. All neonatal and maternal electronic medical records were retrieved from the from the hospital's database after approval of the study protocol. In this study, we included women aged 13–34 years who gave birth between June and December 2018 from this cohort. Multiple deliveries and incomplete medical records were excluded from the analysis.

2.3. STUDY VARIABLES

The following study variables were considered: maternal age, gestational age at delivery, birth weight, type of delivery, 1- and 5-minute Apgar scores less than 7, and fetal deaths

2.4. DATA COLLECTION AND ANALYSIS

Data were extracted in March 2019 using a standardized form by one researcher and checked for accuracy by a second researcher. Any discrepancies were resolved through discussion, until consensus was reached. The quantitative data were transferred to statistical software for analysis.

For the analysis of data, two groups were distinguished according to age: 1) girls aged 13 to 19 years old, and 2) women aged 20 to 34 years old. Study variables were expressed as absolute values, percentages, and means. Fisher's exact test was used to compare study variables between the groups, and odds ratio (OR) was calculated to evaluate the risk of adverse outcomes. A p-value of less than .05 was considered significant. The statistical software package SPSS for Windows, version 23.0, was used for all analyses (SPSS Inc., Chicago, IL).

2.5. Ethical Approval

All ethical principles established by the National Health Council in Resolution number 466/2012 were respected and in accordance with the 1964 Helsinki declaration and its later amendments. The study protocol was approved by Research Ethics Committee of the Universidade Estadual Vale do Acaraú, and access to data was authorized by the director of the maternity hospital.

3. RESULTS

A total of 1642 pregnant women's medical records were included in this study, 461 (28.1%) belonged to the age group of 13-19 years, and 1181 (71.9%) to that of 20-34 years. Regarding the type of birth, cesarean section was the most frequent mode of delivery (51.6%).

In the comparison between groups, there were significantly more cesarean deliveries to mothers aged 20 to 34 years (657 (55.6%) vs. 190 (41.2%), $p < .0001$). Mean gestational age at delivery was 39.6 weeks for the younger group of pregnant women and 38.1 weeks for those between 20 and 34 years; nonetheless, there was a significantly higher proportion preterm deliveries in the group of adolescent mothers (118 (25.6%) vs. 241 (20.4%), $p = .0239$).

In the age group of 13-19 years, birth weight of the new-borns varied between 950 and 4,280 grams, and the proportion of low birth weight (< 2,500 grams) was 21.9%, compared to 560 and 4,885 grams in 20-34-year-old group; the prevalence rate of low birth weight in this group was 19.0%, p= .19.

In the adolescent mother group, an Apgar score of less than 7 at one minute occurred in 60 neonates (13.0%) and 22 (4.8%) at five minutes compared to 177 (15.0%) and 44 (3.7%), respectively, in the adult mother group. There were no significant differences between the groups. There were 7 fetal deaths (1.5%) in the 13-19-year-old group, and 9 cases (0.8%) in the 20-34-year-old group, p= .17 Table 1

Table 1

Table 1 Comparative analysis of study variables according to age group

Variable	Maternal 13-19 years age (n=461)		Maternal age20-34 years (n=1181)		p-value[a]
	n	%	n	%	
Cesarean delivery	190	41.2	657	55.6	**< .0001**
Prematurity (< 37 weeks)	118	25.6	241	20.4	**0.0239**
Low birth weight (< 2500 grams)	101	21.9	224	19	0.19
Apgar score at 1 min. <7	60	13	177	15	0.35
Apgar score at 5 min. <7	22	4.8	44	3.7	0.33
Fetal death	7	1.5	9	0.8	0.17

[a] p-value calculated using Fisher's exact test (two-tailed)

As shown in Table 2 adolescent mothers were significantly less likely to have cesarean delivery than adult mothers (OR = 0.559, p < .0001) and more likely to give birth prematurely (OR = 1.342, p = .0225). Low birth weight, and Apgar score < 7 at 5 minutes, and fetal death were more likely among mothers aged 13-19 years; however, these study variables not present significant probability Table 2

Table 2

Table 2 Odds ratio and confidence intervals of study variables for maternal age, 13-19 versus 20-34 years

Variable	OR	%95 CI			p-value
		Lower	Upper	Z-score	
Cesarean delivery	0.559	0.45	0.696	5.224	**< .0001**
Prematurity (< 37 weeks)	1.342	1.042	1.727	2.282	**0.0225**
Low birth weight (< 2500 grams)	1.199	0.92	1.561	1.343	0.18
Apgar score at 1 min. <7	0.849	0.62	1.163	1.021	0.31
Apgar score at 5 min. <7	1.295	0.767	2.168	0.968	0.33
Fetal death	2.008	0.743	5.423	1.375	0.17

OR: Odds ratio; CI: Confidence interval

4. DISCUSSION

Based on the results obtained in our study, the proportion of adolescent pregnancies (28.1%) is in line with that found in the literature, in which the rates do not usually exceed 30% World Health Organization WHO (2020), Santos et al. (2009)

Recently, living conditions and the general health of pregnant women together with the quality of obstetric care during prenatal, birth and new-born periods have been identified as being more important than mother's age for fetal outcomes. However, prenatal care among adolescent mothers varies significantly Santos et al. (2014), Minjares-Granillo et al. (2016)

In the present study, the incidence of cesarean delivery (51.6%) was higher than that found in other studies. For example, for the year 2015, in Brazil, Dalmoro et al. (2018) reported 984,307 hospitalizations for delivery with 63.8% being normal deliveries and 36.2% cesarean births. In the United States, the percentage of all deliveries by cesarean was 31.9% for 2018; nevertheless, cesarean delivery was

more frequent among older women compared to younger women, in line with the results found in the present study Martin et al. (2019) This higher prevalence of cesarean deliveries has been confirmed in another Brazilian study, where 37.3% of deliveries among adult mothers were cesarean births compared 28.7% among adolescent mothers Silva et al. (2018)

Several authors have reported that adolescent pregnancies are associated with adverse maternal and fetal outcomes such as maternal anemia, preeclampsia, gestational diabetes mellitus, prematurity, low birth weight, low Apgar score and neonatal death Karataşlı et al. (2019), Malabarey et al. (2012), Yang et al. (2019) In the present study, preterm delivery was significantly related to adolescent pregnancy when compared to adult mothers, which according to Raatikainen et al. (2006) may be due to biological factors, lifestyles, or poor prenatal assistance.

However, the results of the present study did not confirm any other adverse fetal outcomes. There were no significant differences between adolescent and adult mothers for low birth weight, Apgar score at 1 and 5 minutes and fetal death. This has also been demonstrated in other studies, which report that although adolescent pregnancies are associated with adverse outcomes, the improvement of health care strategies and services is capable of reducing both maternal and fetal complications Minjares-Granillo et al. (2016), Raatikainen et al. (2006), Ganchimeg et al. (2014)

Some methodological limitations of this study must be considered. First, as it is a cross-sectional study, conclusions are limited to inferences regarding associations rather than cause and effect relationships. Second, this study was conducted as a single maternity unit with a limited coverage area and that mainly serves users from the less favored socioeconomic classes, thus restricting the generalization of our results. Furthermore, data was not collected on potential confounders such as the number of prenatal visits during pregnancy, demographic characteristics, socioeconomic status, etc. This data would provide further insight on cause-and-effect relationships to explain maternal and fetal outcomes. Nevertheless, this study adds evidence on the phenomenon of adolescent pregnancies.

5. CONCLUSIONS

Adolescent mothers are at increased risk of preterm birth compared to adult mothers, and since this factor is associated short- and long-term adverse outcomes for the neonate, there is a need to prioritize this age group in prenatal care, offering qualified assistance in order to reduce negative consequences. In addition, the high prevalence of adolescent pregnancies seen in this study points out the need for improved information on family planning and broad access to contraceptive methods for this age group.

Ethics declarations

Ethical approval

All ethical principles established by the National Health Council in Resolution number 466/2012 were respected and in accordance with the 1964 Helsinki declaration and its later amendments. The protocol for this study was approved by the Research Ethics Committee of the Universidade Estadual Vale do Acarau.

CONFLICT OF INTERESTS

The authors declare that they have no conflict of interest.

ACKNOWLEDGMENTS

None.

REFERENCES

Chalem, E. Mitsuhiro, S. S. Ferri, C.P. Barros, M. C. M. Guinsburg, R. Laranjeira, R. (2007). Gravidez na adolescência : perfil sócio-demográfico e comportamental de uma população da periferia de São Paulo, Brasil. Cad Saude Publica, 23(1), 177-86. https://doi.org/10.1590/S0102-311X2007000100019

Costa, E. L. D. Sena, M. C. F. Dias, A. (2011). Gravidez na adolescência: determinante para prematuridade e baixo peso. Com Ciencias Saude.

Dalmoro, C. Rosa, R. Bordin, R. (2018). Normal delivery and cesarean section : cost per brazilian regions, 2015. Rev Assoc Med Bras, 64(11), 1045-1049. https://doi.org/10.1590/1806-9282.64.11.1045

Darroch, J. E. Woog, V. Bankole, A. Ashford, L. S. (2016). Adding it up : Costs and benefits of meeting the contraceptive needs of adolescents. New York : Guttmacher Institute.

Dubuc, I. F. Ferrari, R. A. P. (2009). Adolescentes atendidos num serviço público de urgência e emergência : perfil de morbidade e mortalidade. Rev Eletr Enferm, 8(2). https://doi.org/10.5216/ree.v8i2.7040

Ganchimeg, T. Ota, E. Morisaki, N. Laopaiboon, M. Lumbiganon, P. Zhang, J. et al. (2014). Pregnancy and childbirth outcomes among adolescent mothers : a World Health Organization multicountry study. BJOG, 1, 40-48. https://doi.org/10.1111/1471-0528.12630

IBGE. (2011). Instituto Brasileiro de Geografia e Estatística. Censo Demográfico, Características da população e dos domicílios - Resultados do Universo. Rio de Janeiro : IBGE.

Karataşlı, V. Kanmaz, A. G. İnan, A. H. Budak, A. Beyan, E. (2019). Maternal and neonatal outcomes of adolescent pregnancy. J Gynecol Obstet Hum Reprod, 48(5), 347-50. https://doi.org/10.1016/j.jogoh.2019.02.011

Kawakita, T. Wilson, K. Grantz, K. L. Landy, H. J. Huang, C. C. Gomez-Lobo, V. (2016). Adverse Maternal and Neonatal Outcomes in Adolescent Pregnancy. J Pediatr Adolesc Gynecol, 29(2), 130-136. https://doi.org/10.1016/j.jpag.2015.08.006

Malabarey, O. T. Balayla, J. Klam, S. L. Shrim, A. Abenhaim, H. A. (2012). Pregnancies in young adolescent mothers : a population-based study on 37 millions births. J Pediatr Adolesc Gynecol, 25(2), 98-102. https://doi.org/10.1016/j.jpag.2011.09.004

Martin, J. A. Hamilton, B. E. Osterman, M. J. K. Driscoll, A. K. (2019). Births : Final Data for 2018. Natl Vital Stat Rep, 68(13), 1-47

Minjares-Granillo, R. O. Reza-López, S. A. Caballero-Valdez, S. Levario-Carrillo, M. Chávez-Corral, D. V. (2016). Maternal and Perinatal Outcomes Among Adolescents and Mature Women : A Hospital-Based Study in the North of Mexico. J Pediatr Adolesc Gynecol, 29(3), 304-311. https://doi.org/10.1016/j.jpag.2015.11.005

Moraes, A. N. Likwa, R. N. Nzala, S. H. (2018). A retrospective analysis of adverse obstetric and perinatal outcomes in adolescent pregnancy: the case of Luapula Province, Zambia. Matern Health Neonatol Perinatol, 4 :20. https://doi.org/10.1186/s40748-018-0088-y

Moura, B. Saldanha, M. Lopes, M. Guaraná, M. Mendes, N. Simoes, R. et al. (2011). Gravidez na adolescência : fatores associados e resultados perinatais em uma Maternidade-Escola do Rio de Janeiro. Adolesc Saude, 8(1), 15-20.

Raatikainen, K. Heiskanen, N. Verkasalo, P. K. Heinonen, S. (2006). Good outcome of teenage pregnancies in high-quality maternity care. Eur J Public Health, 16(2), 157-161. https://doi.org/10.1093/eurpub/cki158

Rodrigues, A. Fisberg, M. Cintra, I. (2005). Avaliação do estado nutricional, prevalência de sintomas de anorexia e bulimia nervosa e percepção corporal de modelos adolescentes brasileiras. Nutr Bras, 4(4), 182-7.

Santos, G. H. N. D. Martins, M. D. G. Sousa, M. D. S. Batalha, S. D. J. C. (2009). Impacto da idade materna sobre os resultados perinatais e via de parto. Rev Bras Ginecol Obstet, 31(7), 326-34.

Santos, N. L. D. A. C. Costa, M. C. O. Amaral, M. T. R. Vieira, G. O. Bacelar, E. B. Almeida, A. H. D. V. D. (2014). Gravidez na adolescência : análise de fatores de risco para baixo peso, prematuridade e cesariana. Cienc Saude Colet, 19(3), 719-26. https://doi.org/10.1590/1413-81232014193.18352013

Saúde, M. D. (2021). Departamento de Informática do Sistema Único de Saúde (Datasus), Informações de Saúde (TABNET) Estatísticas Vitais. Brasília : Datasus.

Silva, N. N. D. Chaves, L. N. Chaves, L. N. Rêgo, A. D. Araújo, D. B. (2018). Análise de partos em adolescentes e repercussões perinatais em uma maternidade pública na Amazônia. Adolesc Saude, 15(1), 50-7.

World Health Organization WHO. (1993). The health of young people : a challenge and a promise. Geneva : WHO.

World Health Organization WHO. (2016). Global Health Estimates 2015 Geneva : WHO,

World Health Organization WHO. (2020). Fact sheets : Adolescent pregnancy. Geneva : WHO.

Yang, C. Chen, X. Zu, S. He, F. (2019). Retrospective analysis of risk factors for low 1-minute Apgar scores in term neonates. Braz J Med Biol Res, 52(12). https://doi.org/10.1590/1414-431x20199093