MATERNAL-PERINATAL COMPLICATIONS ASSOCIATED WITH ADOLESCENT PREGNANCY: A CASE-CONTROL STUDY

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ABSTRACT

Objective: To evaluate the perinatal maternal complications associated with adolescent pregnancy in a Peruvian hospital, 2018. **Material and methods:** Analytical study of cases and controls where 160 puerperal women participated, considering as a case those who present at least one perinatal complication. A review of the medical history was performed, considering only the diagnostic records generated in the institution, likewise, every person who is between 10 and 19 years old was categorized as a teenager. It was approved by the institutional ethics committee. The association was determined by Pearson's Chi-square test and Logistic Regression, the risks were evaluated using crude and adjusted Odds Ratio and their respective 95% Confidence Interval**. Results:** Among adolescents, a large part is in its late adolescence (90.54%), is single (74.32%) and a housewife (93.24%). The maternal complications with greater presence in the group of teenage pregnant women were urinary tract infection (ORa:2.46; p=0.072) and funicular dystocia (ORa:3.21; p=0.017); also, the most recurrent perinatal complication in adolescents was acute fetal distress (aOR: 2.11; p=0.091). **Conclusion:** Teen pregnancy is presented as a risk factor for the presence of urinary tract infection, funicular dystocia, and acute fetal distress.

Key words: Adolescent health, Pregnancy complications, Perinatal health (Source: MeSH NLM)

INTRODUCTION

Pregnancy during adolescence is a pregnancy that occurs in a person up to 19 years of age (1); the highest rates are found in Latin American and sub-Saharan African countries, while the lowest are found in Switzerland, the Netherlands, Singapore and Slovenia. (2–4) The importance of adolescent pregnancy lies in the fact that its presence is associated with complications for the mother and the newborn, such as hypertensive disorders, maternal anemia, prematurity, postpartum hemorrhage and low birth weight, generating a higher frequency of complications; likewise, they show a lower proportion of cesarean deliveries and a greater number of prenatal care. (5–7)

The repercussions attributed to pregnancy have been an issue evaluated in several countries, although there are still studies that contradict the apparent risk condition that pregnancy shows during adolescence on the presence of certain pathologies (8), showing that age as such is not a determinant but the barriers attributed to this population. Likewise, in Peru, studies have addressed the issue by prioritizing the causal agents of adolescent pregnancy, with few that evaluate repercussions considering a significant sample 9, since most of them are descriptive reports without comparison groups or evaluations of specific pathologies. (10,11)

Thus, this study would complement what has been reported regarding the clinical consequences of adolescent pregnancy, which can be used for reviews in this regard. Therefore, we have set ourselves the objective of evaluating which perinatal maternal complications are associated with adolescent pregnancy in a Peruvian hospital, 2018.

MATERIAL AND METHODS

This is a cross-sectional analytical study that evaluated the clinical registry of postpartum women treated at the San Juan de Lurigancho Hospital in the city of Lima (Peru), which is a public general hospital that belongs to the Peruvian Ministry of Health. The participants were divided into those who had a maternal-perinatal complication (cases) and those who did not (controls).

For the calculation of the sample size, the Epidat software, version 4.2, was considered, where a confidence level of 95%, a power of 80% and an estimated Odds Ratio of 2 were considered, based on a previous study (12), obtaining a minimum sample of 160 puerperal women. Those who present diagnostic records at the San Juan de Lurigancho Hospital and delivery at the health institution were selected. Those who have a pathology prior to pregnancy, mental illness or previous abortion were excluded. Records that are poorly filled out or illegible have been removed. The sampling was probabilistic, simple random.

The recording of the variables was obtained from the electronic medical record. The age of the participant was identified as an independent variable, considering as an adult anyone aged 20 years or older and as an adolescent someone between 10 and 19 years old. 1 Likewise, general characteristics (origin, race, level of education, marital status and occupation) and obstetric characteristics (gestational age at delivery, pregnancy and parity) of the participants were obtained.

The dependent variable of the study was maternal-perinatal complication, dimensioned as maternal complication (anemia, postpartum hemorrhage, urinary tract infection, preeclampsia, vaginal tear, premature rupture of membranes, premature placental abruption, dystocia of presentation, funicular dystocia, preterm delivery and threatened miscarriage) and perinatal complication (low birth weight, sepsis, prematurity, respiratory distress and acute fetal distress).

The data obtained were recorded in an Excel database, in order to evaluate the quality of the data. The statistical analysis was performed using the STATA software, version 14. Categorical variables were reported using frequencies and percentages, while for quantitative data using measures of central tendency and dispersion. The crude association between variables was evaluated using Pearson's Chi-square test, and then adjusted by logistic regression, considering the variables that could generate effect modification. The risk was assessed using the Odds Ratio (OR), considering a 95% confidence level. In order to search for the replicability of the results, the following database is

made available: https://doi.org/10.6084/m9.figshare.11919300.v1

Due to the fact that a review of medical records was carried out, a review of the project was requested by the ethics committee of the San Juan de Lurigancho Hospital, which was approved through official letter 288-2018-UADI-HSJL. The people who participated in the research were responsible for encoding all the information obtained, in order to protect the identity of the participants.

RESULTS

Among the general characteristics of the 160 puerperal women enrolled in the study, it was found that, on average, they had an age of 22.01±4.92 years. All the participants reported having a mixed race, as well as a large part had a high school education (78.13%) and an occupation as a housewife (91.88%).

Regarding marital status, there was a significant difference between the proportion of single adolescents (22.97%) and single adults (9.3%), which was significant (p=0.045). (**Table 1**).

Table 2 shows the obstetric characteristics. The gestational age at which delivery took place was on average 38.52±2.51 weeks, with this value being homogeneous between adolescents and adults. Most of the adolescents were first-time (71.62%), while in the adults the majority were multi-gestation (71.09%) (p<0.001). Finally, among adolescents a large part were primiparous (86.49%), while in adults they were between multiparous (43.02%) and primiparous (41.86%) (p<0.001).

Then, in **Table 3**, maternal complications associated with adolescent pregnancy were evaluated. It was found that adolescent participants had a higher proportion of urinary tract infection than adult participants (24.32% vs. 11.63%), which showed that being an adolescent was a risk factor for urinary tract infection (aOR=2.46; p=0.072).

Table 1. General characteristics of adolescent and adult puerperal women treated at the San Juan de Lurigancho Hospital

	Total		Adolescents*		Adult		p †
	n	%	n	%	n	%	
Age							
(Average; D.S.)	*(22,01: 4,92)*		*(18,01; 1,19)*		*(25,45; 4,27)*		-
Self-declared race							
Black	0	0,0	0	0,0	0	0,0	
Mestizo	160	100,0	74	100,0	86	100,0	-
White	0	0,0	0	0,0	0	0,0	
Level of education							
None	0	0,0	0	0,0	0	0,0	
Primary	18	11,25	7	9,46	11	12,79	0,697
High school	125	78,13	60	81,08	65	75,58	
Superior	17	10,63	7	9,46	10	11,63	
Marital status							
Single	25	15,63	17	22,97	8	9,3	
Cohabitant	128	80,00	55	74,32	73	84,88	
Married woman	7	4,38	2	2,70	5	5,81	0,045
Widow	0	0,0	0	0,0	0	0,0	
Divorcee	0	0,0	0	0,0	0	0,0	
Occupation							
Student	3	1,88	0	0,0	3	3,49	
Housewife	147	91,88	69	93,24	78	90,70	0,264
Worker	10	6,25	5	6,76	5	5,81	
Total	**160**	**100,0**	**74**	**100,0**	**86**	**100,0**	

* Considering the World Health Organization definition (<20 years)
† Assessed using Pearson's Chi-square test

Table 2. Obstetric characteristics of postpartum women treated at the San Juan de Lurigancho Hospital

	Total		Adolescents*		Adult		p †
	n	%	n	%	n	%	
Gestational age in weeks							
(Average; D.S.)	*(38,52; 2,51)*		*(38,61; 2,32)*		*(38,44; 2,67)*		0.678††
Pregnancy							
Primigesta	77	48,13	53	71,62	24	27,91	<0.001
Multigesta	83	51,88	21	28,38	62	72,09	
Parity							
Nulliparous	1	0,63	0	0,0	1	1,16	<0.001
Primigravida	100	62,50	64	86,49	36	41,86	
Multiparous	47	29,38	10	13,51	37	43,02	
Great multiparous	12	7,50	0	0,0	12	13,95	
Total	**160**	**100,0**	**74**	**100,0**	**86**	**100,0**	

* Considering the World Health Organization definition (<20 years)† Assessed using Pearson's Chi-square test
†† Assessed using Student's T-test

Likewise, adolescent participants also had a higher proportion of funicular dystocia (28.38% vs 11.63%), thus being a significant risk factor (aOR=3.21; p=0.017).

Finally, **Table 4** shows the perinatal complications of the participants. Crude and adjusted analysis showed that none of the complications were associated with adolescent pregnancy (p>0.05).

DISCUSSION

The study showed that the proportion of urinary tract infection is usually more frequent in the group of pregnant adolescents than in the group of adults, which coincides with studies carried out in the interior of Peru (10) and abroad, such as Ecuador (13) and Thailand 14. This trend has been observed even in adolescents who do not have a pregnancy and is a topic of interest in pediatrics because its diagnosis and management is usually followed as if it were an adult patient, when there are cases of absence of clinical symptoms, modification in the collection of the urine sample, variations of the urinary tract and various strategies for its prevention. (15)

Continuing with maternal complications, dystocia was also shown to be an associated factor.

Regarding a study carried out by Pinzas (16) in a hospital in the Peruvian capital, it was reported that among pregnant adolescents, funicular dystocia represented 30% of the complications, a result that is similar to what was found in the present study. Likewise, a study from Honduras (17) indicated that cases of dystocia during labor were recorded among puerperal women who were younger than 19 years old, which supports the results found in the present research; however, the framework that explains this event remains a research topic to be elucidated.

It is worth mentioning that there are previous studies (18) showing that the most frequent complication was preeclampsia with findings of severity. Regarding this finding, it is worth mentioning that in the present study the severity criteria were not considered, so it could not be concluded whether or not we agree with the author. Likewise, it should be noted that in the study we found a low proportion of cases of preeclampsia in adolescents, so it would merit generating more studies in this regard in our geographical environment to evaluate whether there really is an association.

Table 3. Maternal complications associated with adolescent pregnancy

	Adolescents		Adult		p †	Orc	p ††	Pray*
	n	%	n	%				
Anaemia								
Presents	35	47,30	40	46,51	0,921	1,03	0,998	1,00
Not present	39	52,70	46	53,49				
Postpartum hemorrhage								
Presents	4	5,41	8	9,30	0,356	0,56	0,104	0,31
Not present	70	94,59	78	90,70				
Urinary tract infection								
Presents	18	24,32	10	11,63	0,039	2,44	0,072	2,46
Not present	56	75,68	76	88,37				
Preeclampsia								
Presents	2	2,70	7	8,14	0,156	0,31	0,176	0,29
Not present	72	97,30	79	91,86				
Vaginal tear								
Presents	17	22,97	16	18,60	0,497	1,30	0,998	0,99
Not present	57	77,03	70	81,40				
Premature rupture of membranes								
Presents	24	32,43	27	31,40	0,888	1,05	0,691	1,17
Not present	50	67,57	59	68,60				
Placental abruption								
Presents	1	1,35	2	2,33	0,654	0,57	0,947	1,12
Not present	73	98,65	84	97,67				
Presentation Dystocia								
Presents	8	10,81	12	13,95	0,550	0,75	0,424	0,64
Not present	66	89,19	74	86,05				
Funicular dystocia								
Presents	21	28,38	10	11,63	0,001	3,01	0,017	3,21
Not present	53	71,62	76	88,37				
Preterm delivery								
Presents	4	5,41	8	9,30	0,356	0,56	0,394	0,53
Not present	70	94,59	78	90,70				
Threat of abortion								
Presents	8	10,81	8	9,30	0,751	1,18	0,224	2,26
Not present	66	89,19	78	90,70				
Total	**74**	**100,0**	**86**	**100,0**				

ORc: Raw Odds Ratio; ORa: Adjusted Odds Ratio; 95%CI: 95% confidence interval† Assessed using Pearson's Chi-square test
†† Assessed by the Logistic Regression Test
* Adjusted for: Marital Status, Gratuity and Parity

Table 4. Perinatal complications associated with adolescent pregnancy

	Adolescents		Adult		p †	Orc	p ††	Pray*
	n	%	n	%				
Low birth weight								
Presents	7	9,46	11	12,79	0,508	0,71	0,425	0,61
Not present	67	90,54	75	87,21				
Sepsis								
Presents	0	0,0	0	0,0	-	-	-	-
Not present	74	100,0	86	100,0				
Prematurity								
Presents	4	5,41	8	9,30	0,356	0,56	0,394	0,53
Not present	70	94,59	78	90,70				
Shortness of breath								
Presents	28	37,84	32	37,21	0,935	1,03	0,691	0,86
Not present	46	62,16	54	62,79				
Acute fetal distress								
Presents	25	33,78	17	19,77	0,047	2,07	0,091	2,11
Not present	49	66,22	69	80,23				
Total	**74**	**100,0**	**86**	**100,0**				

ORc: Raw Odds Ratio; ORa: Adjusted Odds Ratio; 95%CI: 95% confidence interval† Assessed using Pearson's Chi-square test
†† Assessed by the Logistic Regression Test
* Adjusted for: Marital Status, Gratuity and Parity

Regarding perinatal complications, acute fetal distress was found to be a risk factor in adolescent pregnancy, which coincides with studies carried out in Peru (10), which reports that the main indication for cesarean section in adolescent pregnant women is the presence of acute fetal distress 20.5%, this state being the most prevalent in this population. However, it differs from studies carried out by La Rosa (19) and Arévalo (20) where they report that the perinatal complication that was most found was low birth weight with 8.1% and 18% respectively. According to Velastegui (13), 12% had a complication where respiratory distress had a higher percentage with 6%, compared to our study that presented 37.84%.

A limitation perceived in the study corresponds to the case-control design itself, where there is no follow-up of pregnant women treated in the hospital and there is the possibility that a group with complications have chosen to go to a specialized institute for their delivery care.

Likewise, the date of diagnosis has not been recorded, so it is unknown if certain complications began prior to pregnancy and were screened in the first prenatal control. On the other hand, there is the strength that all data was obtained from the electronic medical record, avoiding self-reported questionnaires that favor the subjectivity of the data.

CONCLUSIONS

Finally, we concluded that the maternal complications associated with adolescent pregnancy are urinary tract infections and funicular dystocia, while the associated maternal complications were acute fetal distress.

BIBLIOGRAPHIC REFERENCES

1. World Health Organization. Development in adolescence [Internet]. WHO. [cited 2019 April 16]. [Link]

2. Sedgh G, Finer LB, Bankole A, Eilers MA, Singh S. Adolescent Pregnancy, Birth, and Abortion Rates Across Countries: Levels and Recent Trends. J Adolesc Health Off Publ Soc Adolesc Med. February 2015; 56(2):223-30. [Link]

3. Fuller TR, White CP, Chu J, Dean D, Clemmons N, Chaparro C, et al. Social Determinants and Teen Pregnancy Prevention: Exploring the Role of Nontraditional Partnerships. Health Promot Pract. 2018; 19(1):23-30. [Link]

4. Kassa GM, Arowojolu AO. Odukogbe AA, Yalew AW. Prevalence and determinants of adolescent pregnancy in Africa: a systematic review and Meta-analysis. Reprod Health. November 29, 2018; 15(1):195. [Link]

5. Azevedo WF de, Diniz MB, Fonseca ESVB, Azevedo LMR de, Evangelista CB. Complications in adolescent pregnancy: systematic review of the literature. Einstein Sao Paulo Braz. December 2015; 13(4):618-26. [Link]

6. Çift T, Korkmazer E, Temur M, Bulut B, Korkmaz B, Ozdenoğlu O, et al. Adolescent pregnancies: complications, birth outcomes and the possible solutions. Ginekol Pol. 2017; 88(7):393-7. [Link]

7. Kawakita T, Wilson K, Grantz KL, Landy HJ, Huang C-C, Gomez-Lobo V. Adverse maternal and neonatal outcomes in adolescent pregnancy. J Pediatr Adolesc Gynecol. April 2016; 29(2):130-6. [Link]

8. Yuce T, Aker SS, Seval MM, Kalafat E, Soylemez F. Obstetric and neonatal outcomes of adolescent pregnancy. North Clin Istanb. 2015; 2(2):122-7. [Link]

9. Okumura JA, Maticorena DA, Tejeda JE, Mayta-Tristán P, Okumura JA, Maticorena DA, et al. Adolescent pregnancy as a risk factor for obstetric and perinatal complications in a hospital in Lima, Peru. Rev Bras Saúde Materno Infant. December 2014; 14(4):383-92. [Link]

10. Bendezú G, Espinoza D, Bendezú-Quispe G, Torres-Román JS, Huamán-Gutiérrez RM. Characteristics and risks of adolescent pregnant women. Rev Peru Ginecol Obstet. January 2016; 62(1):13-8. [Link]

11. Hernández-Maldonado C, Rosales-Rimache J. Association between adolescent pregnancy and hyperbilirubinemia and low birth weight: retrospective cohort in a hospital in Peru, 2015-2016. An Fac Med. April 2019; 80(2):150-6. [Link]

12. Fernández-Pérez Z, López-Fernández L, López-Baños L. Clinical-epidemiological characterization of low birth weight. Rev Cuba Med Gen Integral. March 2015; 31(1):27-34. [Link]

13. Eguez JEV, Navarro MIH, Cotto JJR, Arias AJR, Franco HJA, Velastegui AJH. Perinatal complications associated with pregnancy in adolescents in Atacames. Rev Cuba Med Gen Integral [Internet]. 7 June 2018 [cited 29 February 2020]; 34(1). [Link]

14. La-Orpipat T, Suwanrath C. Pregnancy outcomes of adolescent primigravida and risk of pregnancy-induced hypertension: a hospital-based study in Southern Thailand. J Obstet Gynaecol J Inst Obstet Gynaecol. October 2019; 39(7):934-40. [Link]

15. Korbel L, Howell M, Spencer JD. The clinical diagnosis and management of urinary tract infections in children and adolescents. Paediatr Int Child Health. November 2017; 37(4): 273-9. [Link]

16. Pinzas-Espinoza H. Obstetric complications in adolescent pregnant women treated in the Gynecology and Obstetrics Service of the Vitarte Hospital in 2015. Univ Ricardo Palma [Internet]. 2016 [cited 2020 March 1]. [Link]

17. Reyes O, Erazo A, Carrasco J, Gonzales D, Mendoza A, Mejía M. Obstetric complications in adolescents and adult women with or without associated risk factors, Honduras 2016. Arch Med. 12(4):4. [Link]

18. Ortiz-Martínez RA, Otalora-Perdomo MF, Delgado ABM, Luna Solarte DA. Adolescence as a risk factor for maternal and neonatal complications. Rev Chil Obstet Ginecol. November 2018; 83(5):478-86. [Link]

19. Rosa A. Complications in newborns of early adolescent mothers at the Archbishop Loayza National Hospital from May 2008 to May 2012. Horiz Méd Lima. January 2015; 15(1):14-20. [Link]

20. Arévalo-Gómez FJ, Torres-Medina YN. Maternal and obstetric risk factors in relation to maternal-perinatal complications in adolescent parturients treated at Hospital II – 2 Tarapoto, August - December 2016. Universidad Nacional San Martín [Internet]. 2017 [cited 2020 Mar 1]. [Link]

Contributions:

Josselin Cortez Anyosa: Conceptualization, research, project management, writing, revision, editing and visualization. **Clara Diaz Tinoco:** Validation, data curation, formal analysis, research, methodology, writing of the original draft.