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Obstetric and perinatal outcomes in teenage pregnancy: a literature review

Abstract

Pregnancy during adolescence continues to be a frequent situation, mostly in developing countries. Maternal age is a key element to be taken into account when managing obstetric patients, as it is related with obstetric and perinatal outcomes. We conducted a literature review to address the obstetric results of pregnancy in teenage mothers. We reviewed articles for the last 5 years in different databases including 'Pregnancy', 'Teenager', 'Adolescent', 'Complications' and 'Outcomes' as key words. We obtained 2260 articles after the initial search, but only 28 met the inclusion criteria and were therefore reviewed. Most studies were excluded for not clearly specifying one of more groups of teenage patients, lacking comparison of these groups with no-teenage patients, or not addressing the obstetric outcomes of those pregnancies. The outcomes were divided into complications of pregnancy, childbirth, puerperium and neonatal complications. We found that there is an association between young maternal age and preterm birth, pre-eclampsia/eclampsia, fetal growth restriction and stillbirth, among others. For the newborn we found outcomes such as low APGAR scores and admission to intensive care were more frequent in teenage mothers. We conclude that maternal age is an important feature, as there are several obstetric and perinatal compications that are more frequent in teenage mothers than in other age groups.

Keywords: pregnancy, teenager, adolescent, complications, outcomes

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Paller L,[1] Feldman F,[2] Lauria W,[3] Rey G[4]
[1]Resident physician Clinica Ginecotocologica B, Uruguay
[2]Assistant teacher Clinica Ginecotocologica B, Uruguay
[3]Professor Clinica Ginecotocologica B, Uruguay
[4]Associated Professor Clinica Ginecotocologica B, Universidad de la Republica, Uruguay

Correspondence: Rey G, Associated Professor Clinica Ginecotocologica, Universidad de la Republica, Uruguay, Email grazziarey@gmail.com

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Introduction

Maternal age is one of the most important pieces of information to be taken into account in obstetrics and on it depends different risks and prognosis that add up to other clinical features. Under that logic, adolescence is a particularly relevant period involving special features when compared to other moments within the reproductive life. The World Health Organization defines adolescence as a stage of life in which the individual acquires reproductive capacity, transiting the psychological patterns from childhood to adulthood; considering that it runs between 10 and 19 years. It also classifies it in early adolescence (from 10 to 13 years old), middle adolescence (between 14 to 16 years old); and late adolescence (17 to 19 years), each one representing different risks during pregnancy.[1] Even though there is a decreasing number in teen pregnancies worldwide, it is still particularly relevant in developing countries, accounting for a significant percentage of all pregnancies. According to World Health Organization approximately 11% of all births in the world still occur among girls aged 15 to 19. In turn, some 16 million girls aged 15 to 19 and approximately 1 million girls under 15 give birth each year, mostly in low and middle-income countries. Complications during pregnancy and childbirth are the second leading cause of death among girls aged 15 to 19 worldwide and babies of teenage mothers face a significantly higher risk of complications than those born to women aged 20 to 24 years (2). Our objective was to examine whether teenage pregnancy is associated with increased risk of maternal and neonatal complications compared to adults through a systematic literature review to help clinicians in their actions before and during pregnancy in adolescents.

Material and methods

A search was carried out in the electronic databases: PubMed, Medline, Scielo and Lilacs to identify relevant articles. The search was conducted with the following terms: 'Pregnancy, 'Teenager', 'Adolescent', 'Complications' and 'Outcomes'. The search was restricted to articles in English or Spanish and published between 2014 and 2019. The last search was conducted on December 23, 2019. The search of all articles found with these terms was carried out and their selection by title and abstract began to determine if they were consistent with the objectives of the review. Search was carried out by two independent reviewers. Articles that were potentially eligible for inclusion were read in their entirety. When the question remained whether the article was eligible or not, it was also read in its entirety. Disagreements and questions on eligibility for inclusion were discussed among all authors. An exhaustive reading of the selected articles was carried out and a synoptic table was completed. The results were presented descriptively.

Inclusion criteria

The choice of the studies was made based on the description of: complications during pregnancy (abortion, threatened abortion, preeclampsia eclampsia syndrome, threat of preterm delivery, gestational diabetes, urinary tract infections, anaemia, premature rupture of membranes, chorioamnioitis, intrauterine growth restriction, stillbirth and maternal admission to intensive care unit); complications during childbirth (suspected fetal hypoxia, presentation abnormalities, cephalopelvic disproportion, caesarean section, instrumental vaginal delivery, perineal tear and episiotomy); complications during the puerperium (postpartum infection and postpartum hemorrhage); and neonatal complications (preterm birth, low birth weight, large for gestational age, Apgar below 7 points at the first minute of life and at 5 minutes, admission of the neonate to intensive care unit, neonatal death, congenital malformations and neonatal sepsis). Articles from the last 5 years (between December 2014 and December 2019) that clearly defined a group of adolescents under 20 years of age who had a comparison group with adult women of 20 years or more were included.

Exclusion criteria

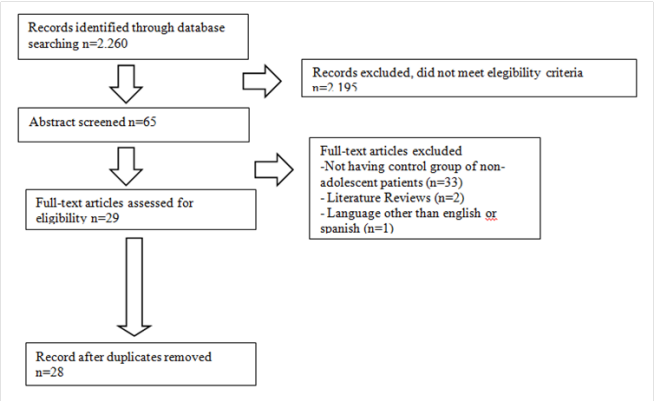
Author letters, editorials, case reports, epidemiological studies and reviews were excluded.

Data extraction

Data from each study were extracted taking into account: country, year, type of study, method of collection, sample size, comparison groups, inclusion and exclusion criteria, and results (complications during pregnancy, childbirth, puerperium and neonatals mentioned previously).[2]

Results

In the initial search, a total of 2.260 were obtained. After the analysis according to title and abstract, 2.195 of the articles were excluded because they did not contemplate the objectives. When reading the full text, 33 more articles were excluded because they did not present comparison groups with an adult population, 2 were excluded because they were revisions, 1 was excluded for being duplicate and 1 was excluded for being in Chinese. A total of 28 articles that met the inclusion criteria were obtained. The search scheme is shown in Figure 1. As for the year of publication, 2 were published in 2014, [3,4] 7 in 2015,[5–11] 6 in 2016,[12–17] 8 in 2017,[18–25] 5 in 2018,[26–30] and 0 in 2019. In relation to the country producing the study: 12 were produced by Latin American countries (3 in Colombia (5) (12) (27), 2 in México (26) (16), 3 in Perú (3) (6) (25), 1 in Brazil (18), 1 in Honduras (17), 1 in Cuba (10) and 1 in Ecuador (11)), 9 in Asia (5 in Turkey (28) (21) (22) (7) (8), 2 in Thailand (13) (9), 1 in South Korea (15) and 1 in India (29)), 3 in Europe (1 in Hungary (30), 1 in Spain (24), 1 in Greece (4)), 2 in North America (14) (23) (both of them in U.S.A) and 2 in África (both of them in Cameroon (19) (20)).



Of the 28 studies, 21 corresponded to cohort studies (5) (26) (3) (18) (13) (19) (20) (21) (22) (29) (7) (30) (14) (15) (16) (23) (4) (9) (10) (25) (11) and 7 correspond to case control studies (12) (27) (6) (28) (8) (24) (17). Regarding the method of data collection 23 they did it from medical records (26) (12) (3) (18) (6) (13) (28) (19) (20) (21) (22) (29) (7) (30) (8) (15) (23) (4) (9) (24) (10) (25) (11), 4 from survey (5) (27) (16) (17) and 1 that did not specify the method of data collection.[14] The studies had age groups for adolescents and for the control group variables. Of the 28 studies: 1 study compared adolescents aged 14 to 19 with women aged 20 to 34 (5), 4 study compared women under 19 years of age and older than 19 years (26) (27) (20) (10), 1 study compared adolescents aged 10 to 19 years with ages 20 or older (12), 1 study compared adolescents aged 10 to 19 divided into early adolescents (10 to 14 years) and late adolescents (15 to 19 years) with women aged 20 to 35 (3), 1 study compared adolescents aged 10 to 19 divided into early adolescents (10-14 years) and late adolescents (15-19 years) with women older than or equal to 20 years (18), 3 study compared adolescents aged 10 to 19 years with adults aged 20-34 years (6) (7) (17), 1 study compared women under 20 with women aged 20 to 34 (13), 1 study compared women under or equal to 19 years divided into early adolescents (under 15 years) and late adolescents (15 to 19 years) with women aged 25 to 30 years (28), 1 study compared adolescents aged 10 to 19 divided into early adolescents (10-16 years) and late adolescents (17-19 years) with women older than or equal to 20 years (19), 1 study compared women under 18 or equal to women aged 19 to 36 (21), 1 study compared adolescents aged 13 to 19 divided into early (aged 13 to 16) and late (aged 17 to 19) with women aged 20 to 21 (22), 1 compared women aged 15 to 19 with women aged 20 to 49 (29), 1 compares children under 19 with births nationwide (30), 1 study compared children under 20 with women aged 20 to 34 (14), 1 study compared adolescents aged 15 to 19 with women aged 20 to 34 (8), 1 study compared adolescents aged 13 to 19 years with over 20 years (15), (13), 1 study compared patients under or equal to 19 years divided into children under 16 to 16 years and 16 to 19 years with women aged 20 to 34 years (16), 1 study compared patients younger than or equal to 19 years divided into children under 15 to 16 years and 16 to 19 years with women aged 20 to 25 (23), 1 study compared adolescents aged 12 to 19 with women aged 20 to 34 (4), 1 study compared patients younger than or equal to 19 years divided into children under 16 to 16 years and 16 to 19 years with women aged 20 to 30 (9), 1 study compared children under 20 with women aged 20 to 30 (24), 1 study compared adolescents aged 12 to 17 with women aged 18 to 29 (25) and 1 study compared adolescents aged 10 to 19 with women aged 20 to 29 (11).Data related to the references included in the review are presented in Table 1. Next, the aforementioned complications will be analyzed (complications during pregnancy, childbirth, puerperium and neonatal).

Complications during pregnancy

Table 2 Regarding pregnancy complications, 3 studies show a statistically significant increase in the risk of abortion. (5) (15) (9). On the other hand, 3 studies show data about the risk of threatened abortion: while one study showed that there is no risk of it but without being of statistic significance (28), another showed increased risk but without calculating statistical significance (25) and other study showed statistically significant increased risk for adolescents (11). In relation to preeclampsia eclampsia syndrome, 17 studies report data about it. Of these, 9 studies showed an increased risk in adolescents of which: 6 having statistical significance (27) (21) (8) (23) (4) (10) and in the other 3 the risk is not statistically significant (3) (17) (11). Another 7 studies indicate that teenage pregnancy does not increase the risk of preeclampsia eclampsia syndrome, where: 2 have statistical significance (6) (28), 4 are not statistically significant (5) (13) (30) (15) and 1 does not calculate statistical significance (25). Regarding the threat of preterm delivery 8 studies, of which 5 report increased risk during adolescent pregnancy: 2 with statistical significance (10) (11), 2 without it (7) (30) and 1 does not calculate statistical significance (25). On the other hand 3 studies reveal that there is no increased risk: 2 with statistical significance (3) (28) and 1 without statistical significance (6).

Regarding gestational diabetes and adolescent pregnancy, 10 studies show results: 2 show increased risk, 1 being statistically significant (4) and another not statistically significant (10); and 8 does not show increased risk where: 5 are statistically significant (3) (13) (28) (30) (15) and 3 are not (21) (7) (8). In urinary tract infections 5 studies showed results demonstrating an increased risk in adolescent pregnancy of which: 2 are statistically significant (6) (11), 2 are not (15) (17) and 1 does not calculate statistical significance (25). 9 studies are related to maternal anaemia and find an increased risk:

4 are statistically significant (3) (6) (23) (4), 4 are not (13) (16) (17) (10) y 1 did not calculate it (25). In relation to premature rupture of membranes, 12 studies show results, where 9 show increased risk: 6 are statistically significant (3) (22) (7) (4) (17) (11) and 3 are not (21) (8) (10). 2 do not show increased risk: 1 is statistically significant (6) and the other is not (23). Four studies were identified regarding the risk of chorioamnionitis where 1 shows an increased risk being statistically significant (27) and 3 do not, within which 1 presents statistical significance (23), other does not (17) and the third one does not calculate it (25). 13 studies present results regarding intrauterine growth restriction, 9 show increased risk: 5 are statistically significant (6) (22) (7) (9) (15) and 4 are not (21) (30) (8) (10). The other 4 studies do not show increased risk but without statistic significance (5) (13) (16) (4). Regarding the risk of death and teenage pregnancy, 10 studies show results. Where 7 show increased risk: 3 are statistically significant (13) (29) (11) and 4 are not (19) (4) (9) (10). However, 3 studies do not show increased risk, all three being statistically non-significant. (5) (28) (17). Finally, only 2 studies show results regarding the variable maternal admission to intensive care showing increased risk being 1 statistically significant (27) while the other one does not (23).

Complications during childbirth

Table 3 We found 6 studies related to suspected fetal hypoxia: 2 did not show increased risk: 1 was not statistically significant (13) and the other does not calculate (25). While the other 4 studies show an increased risk but not statistically significant (21) (8) (15) (11). Regarding presentation abnomalies, 4 studies show results of which 3 show that there is no increase in risk but they are not statistically significant (5) (13) (21) (8) and 1 shows increased risk but it is not statistically significant either (10). Regarding cephalopelvic disproportion only 1 study presents results that do not represent an increase in risk and are statistically significant (13). Regarding the risk of caesarean section, 18 studies show results of which 2 show increased risk: 1 statistically significant (28) and 1 not (10). And 16 studies show no greater risk: 10 statistically significant (3) (18) (13) (22) (14) (15) (23) (4) (9) (24) and 6 do not (19) (20) (21) (7) (30) (8). Regarding the risk of instrumental vaginal delivery, 7 studies show results where only 1 shows increased risk, not being statistically significant (23) while 6 do not show increased risk: 3 are statistically significant (13) (9) (24) and 3 do not (3) (4) (10). Regarding the risk of perineal tearing, 7 studies show results of which 6 show increased risk: 4 are statistically significant (6) (19) (15) and 2 do not (26) (23). Only 1 study does not show increased risk being statistically significant (3). Finally, regarding the risk of episiotomy, 3 studies show results agreeing in an increase in risk in teenage patients: 2 with statistical significance (3) (22) and 1 without it (4).

Puerperal complications

Table 4 Regarding postpartum hemorrhage 13 studies show results where 5 show increased risk: 3 statistically significant (6) (23) (17) and 2 not (7) (9). While 8 studies do not show an increased risk for it: 2 are statistically significant (3) (13), 5 do not (5) (21) (8) (15) (4) and one does not calculate statistical significance (19). On the other hand, 5 studies show data on the risk of puerperal infection where 4 show increased risk: 3 are statistically significant (3) (6) (17) and 1 does not (23). Only 1 study does not show an increased risk for it, not calculating statistical significance (25).

Neonatal complications

Table 5 Regarding preterm births and teenage pregnancy, 22 studies showed results. Of these, 19 showed an increase in risk for it: 15 are statistically significant (12) (27) (18) (13) (28) (21) (22) (7) (8) (15) (23) (4) (9) (24) (10) and 4 are not (5) (20) (30) (11). While only 3 studies did not show an increased risk, none were statistically significant (19) (16) (17). Regarding low birth weight, 12 studies were found, 9 showed an increased risk: 5 are statistically significant (3) (18) (19) (20) (9) and 4 are not (28) (21) (22) (7). The other 3 studies showed no increase in risk, 1 being statistically significant (17) and the other 2 do not (16) (11). Regarding the risk of newborns being large for gestational age there are reports in 9 studies, where 2 showed increased risk not being statistically significant (21) (8) and the other 7 did not demonstrate increased risk: 4 are statistically significant (3) (6) (19) (20) and 3 do not (13) (16) (25). Regarding the Apgar score less than 7 points at the first minute of life, 5 studies reported results and in their entirety showed an increase in risk, being 3 statistically significant. (13) (8) (9) and 2 are not (20) (25). Regarding Apgar score less than 7 points at 5 minutes of life 8 studies showed results of which 6 showed increased risk, 6 statistically significant (3) (18) (28) (19) (8) (9) and 1 without it (13). Only 1 study did not show an increased risk being statistically significant (4). Regarding the risk of admission to neonatal intensive care unit, 7 studies showed results where 6 showed a higher risk: 3 statistically significant (22) (7) (30) and 3 are not (28) (20) (8). Only 1 study showed no greater risk being statistically significant (23). Regarding the risk of neonatal death, 2 studies showed results: 1 that showed a higher risk (8) while the other one does not (17) but both did not present statistical significance. In relation to the risk of congenital malformations, 4 studies showed results and in their entirety demonstrated increased risk for them in adolescent pregnancy, 3 being statistically significant (30) (10) (11) and 1 does not.[16] Finally, only one study showed results regarding the risk of neonatal sepsis demonstrating an increase but not being statistically significant.[17]

Discussion

The results of our review indicate that there is an association between young maternal age and low birth weight, preterm birth, pre-eclampsia/eclampsia, anaemia, fetal growth restriction, stillbirth and premature rupture of membranes. As for complications during childbirth there is an increase in the number of perineal tears and episiotomies. However, there is no increased risk of fetal hypoxia, cephalopelvic disproportion, caesarean section, instrumental vaginal delivery, or abnormal fetal presentation. Regarding puerperal complications, there is an increased risk of puerperal infection but not of postpartum hemorrhage. As for the newborn, there is a higher risk of low birth weight, Apgar score less than 7 points at 1 and 5 minutes, and admission to intensive care unit. Regarding this study, it is important to highlight that no published reviews of the complications of teenage pregnancies in Latin America were found in the past 5 years.[31]

A study by Althabe F y col (31) cover several developing countries in Africa, Latin America and Asia: Kenya, Zambia, India, Pakistan, Guatemala and Argentina. The study recruited 269,273 women from January 2010 to December 2013: 11.9% (32,097 / 269,273) were between 15-19 years old, while 0.14% (370 / 269,273) were girls younger than 15. Like ours, this study shows a significantly higher risks of preterm birth and low birth weight among both early and late adolescents, but not other complications. This study also shows an increase in neonatal and perinatal mortality in sub-Saharan Africa and Latin America, with the highest risk in early adolescents, although the differences in this age group were not significant. Our study does not agree with these findings, although there is a higher incidence of admission to neonatal intensive care and Apgar score less than

7 points at 1 and 5 minutes of life. On the other hand, the findings presented in a systematic review conducted in Africa by Grønvik T et al.[32] match our review: that there is an association between young maternal age and low birth weight, pre-eclampsia/eclampsia, preterm birth and maternal and perinatal mortality in Sub-Saharan Africa. They did not find significant associations with stillbirth or for small for gestational age as we do, and they did not include other variables our report does.

Another retrospective study in Zambia shows similar results to our review in that teenage mothers faced a higher risk for eclampsia, anaemia, haemorrhage, low birth weight, preterm delivery, low Apgar scores. There was a difference between the studies concerning cephalopelvic disproportion, prolonged labour and caesarean section: they found increased risk of those outcomes in teenage mothers while we do not. The risk of fetal hypoxia show no differences in this study, as in ours.[33] Fall et al.[34] pooled data from five different birth cohorts from South Africa, Brazil, Guatemala, India and the Philippines, to examine the associations between maternal age and birth outcomes, as well as adult outcomes for the newborns. They found that having an adolescent mother was associated with low birth weight, preterm birth, small for gestational age babies.[34]

Conclusion

The findings of this review indicate that there is an association between young maternal age and low birth weight, preterm birth, pre-eclampsia / eclampsia, anaemia, fetal growth restriction, stillbirth and premature rupture of membranes, increased number of perineal tears and episiotomies, there is a greater risk for the newborn of low birth weight, apgar score less than 7 points at the first and 5 minutes of life and greater risk of admission to intensive care. We can conclude then that adolescent pregnancy in developing continents presents greater risks than pregnancies in adult women. We may assume this risk is greater when taking into account other aspects such as the socio-economic and cultural impact for adolescents or the weight of parenting, data that do not arise from our research but should be the object of further studies. Finally, we think that future research addressing adolescent pregnancy could help better understand this phenomenon and its implications.

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Conflicts of interest

The author declares there is no conflict of interest.

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