ORIGINAL ARTICLE:

Effect of adolescent pregnancy on the incidence of low birthweight in Dr Soetomo Hospital, Surabaya, Indonesia

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ABSTRACT

Objective: The aim of this study to analyze correlation of neonatal outcome in adolescent pregnancy in Soetomo Hospital within 2014-2017.
Materials and Methods: This study was analytic observational cross-sectional study using medical record period 2014-2017 in Obstetric and Gynecology Department, Faculty of Medicine of Airlangga University by using total sampling.
Results: The number of total sample among all adolescent pregnancy during 4 years was 184 patient (3,2%) of 5770 patient. The neonatal outcome among all of them were low birth weight, 184 cases (7,8%) of 2350 cases were LBW. 19 cases (5,7%) of 329 cases in percentile <10. This data was analyzed by chi-square SPSS with p value 0,218 (p>0,05), means there were no significant correlation.
Conclusion: Adolescent pregnancy had no correlation with low birth weight in neonatal outcome.

Keywords: Adolescent pregnancy; low birth weight; IUGR

ABSTRAK

Tujuan: Penelitian ini bertujuan untuk menganalisa hubungan luaran bayi pada kehamilan remaja di RSUD dr. Soetomo Surabaya periode 2014 – 2017.
Bahan dan Metode: Penelitian ini merupakan penelitian analitik observasional cross sectional study dengan menggunakan data sekunder dari rekam medik periode 2014 – 2017 di Departemen/SMF Obstetri dan Ginekologi RSUD Dr. Soetomo Surabaya dengan menggunakan total sampling.
Hasil: Pada penelitian ini besar sample pada pasien persalinan remaja selama 4 tahun adalah 184 pasien (3,2%) dari total 5770 persalinan. Didapatkan semua luaran persalinan remaja tersebut BBLR, 184 kasus (7,8%) dari 2350 kasus BBLR pada non remaja. Sejumlah 19 kasus (5,7%) dari 329 kasus mengalami persentil < 10. Pada pengolahan analisis data menggunakan chi-square didapatkan p value 0,218 (p > 0,05) yang dapat diartikan tidak ada perbedaan yang signifikan.
Simpulan: Kehamilan remaja tidak berpengaruh terhadap kejadian bayi berat badan lahir rendah.

Kata kunci: Kehamilan remaja, BBLR, KMK

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INTRODUCTION

Adolescent pregnancy is an important health problem in both developed and developing countries. The global adolescent birth rate in girls aged 15 – 19 years old is 49 per 1000 live births, while in Indonesia it is 51 per 1000 live births.[1] This is still far from the 2014 RPJMN target of 30 per 1000 live births. The economic burden of adolescent health spends IDR 1.77 trillion every year.[2] According to UNFPA, it is estimated that the adolescent birth rate in 2030 is likely to remain constant.[3] Adolescent pregnancy is associated with an increased risk of pregnancy complications and poor perinatal outcomes such as preeclampsia, low birth weight (LBW) and prematurity. LBW according to WHO is defined as weight at birth under 2.500 g.[4] Pregnancy in girls under 18 years old has 1.8 times more risk of developing small for gestational age fetus.[5] According to Riskesdas 2013, 10.2% of babies in Indonesia are born with low birth weight (LBW), which is less than 2.500 grams. This percentage decreased from Riskesdas 2010 (11.1%).[6] Reasearch conducted by Ucke S. stated that the incidence of low birth weight was 17.62% higher in the adolescent pregnancy group compared to the control group.[7] Gortzak et al, also obtained the same characteristics, which adolescent pregnancy group took the highest percentage of preterm labor and low birth weight incidence.[8]

According to Hamilton et al., the second most prevalent cause of mortality and morbidity in infants globally was LBW. Another study conducted by Kovavisarach in 2010 at Rajavithi Hospital, Thailand which compared infant outputs of 750 deliveries of adolescent pregnancy (<20 years) with 750 deliveries at older ages (20-34 years) concluded that the incidence of LBW was higher in adolescent girls compared to older women (17.4% compared to 12.2%).[9]

Study conducted by Kozuki, et al. stated that factors such as nulliparous women and aged less than 18 years old had significant impact to the development of small for gestational age fetus, adolescent pregnancy was 1.8 times more likely to have small for gestational age fetus compared to pregnancy at older age. Adolescent pregnancy was also closely related to preterm labor, this method of delivery had a major contribution to the incidence of chromosomal disorders, congenital abnormalities or maternal morbidities such as gestational diabetes, preeclampsia, hypertension and chronic diseases.[5] Therefore, this study was conducted to determine the incidence of LBW in adolescent pregnancy at Dr. Soetomo Hospital Surabaya from 2014 – 2017.

MATERIALS AND METHODS

Data collection was carried out in May 2018 after obtaining ethical approval from the Ethics Committee of Dr. Soetomo No. 0306/KEPK/V/2018. This research was analytic observational retrospective study with cross sectional design which used medical records at Dr. Soetomo Hospital during the period of 2014 – 2017. Research subjects were inpatients of Dr. Soetomo Hospital Surabaya from January 2014 to December 2017. Sampling was done through total sampling. The difference test between groups used was the chi-square crosstab test. Data calculation was done using Microsoft Excell 2016 and statistical calculation was done using the IBM SPSS statistics 23. The level of significance was said to be significant if the p value was under 0.05.

RESULTS AND DISCUSSION

This research was conducted over 4 years from January 2014 to December 2017. This study used secondary data from medical records. Number of birth labors in adolescent pregnancies at Dr. Soetomo Hospital, Surabaya in 2014 - 2017 were 184 cases, about 3.19% of the total birth labors for 4 years which were 5770 cases.

Table 1. Birth labors in adolescent pregnancy in Dr. Soetomo Hospital, Surabaya in 2014 – 2017

Year	Total of labors in adolescents	Total labors	Proportion
2014	22	1829	1,2 %
2015	74	1287	5,75%
2016	38	1285	2,96%
2017	50	1369	3,65%
Total	184	5770	3,19%

Characteristics by age

Adolescent pregnancies at Dr. Soetomo Surabaya in 2014 – 2017 had different characteristics each year. In 2014, the youngest girl got married at the age of 16 years while most got married at 18 years old (45.45%). In 2015, the youngest girl got married at the age of 14 years while most got married at the age of 18 (27.02%). In 2016, the youngest girl got married at the age of 14, while most got married at 18 years old (36.84%). In 2017, the youngest girl got married at the age of 14, while the most got married at 19 years old (46%).

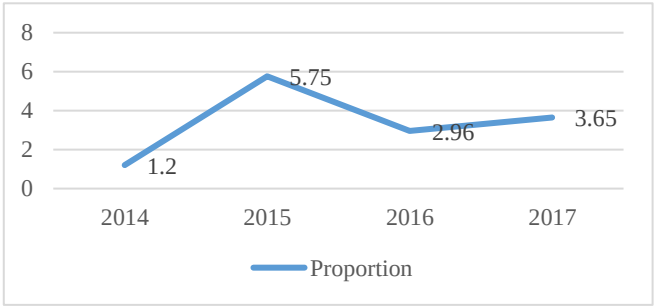

Figure 1. Percentage of labors in pregnancy under 20 years old

Table 2. Characteristics based on marriage age in adolescent pregnancy cases

Year	Youngest marriage age	Oldest marriage age	Most marriage age	Adolescent pregnancy cases	Proportion (Sum of most marriage age / Total patients)
2014	16 years old	19 years old	18 years old (10 patients)	22 patients	10/22 = 45,45%
2015	14 years old	19 years old	18 years old (20 patients)	74 patients	20/74 = 27,02%
2016	14 years old	19 years old	18 years old (14 patients)	38 patients	14/38 = 36,84%
2017	14 years old	19 years old	19 years old (23 patients)	50 patients	23/50 = 46%

Infant outcomes in adolescent pregnancy

The distribution of infant outcomes in adolescent pregnancy each year is based on the distribution of infant weight as shown in Table 3:

Table 3. Distribution of infant outcomes in adolescent pregnancy

Year	1000 – 1500 g	1500 – 2500 g	≥ 2500 g
2014	7	15	0
2015	9	31	34
2016	8	13	17
2017	8	27	15
Total	32	86	66

According to Table 3, the average range of infant outcomes each year was 1.500 – 2.500 grams, shown in 86 cases. Outcome with birth weight above 2.500 grams were shown in 66 cases while outcome with birth weight 1.000 – 1.500 grams were shown in 32 cases.

Out of 184 labors, 19 cases (10%) appeared to have small for gestational age (SGA) infants (p<10). In 2014, there were 5 cases of SGA out of 22 births (23%). In 2015, there were 7 cases of SGA out of 74 births (9%). In 2016, there were 2 cases of SGA out of 38 births (5%). In 2017, there were 5 cases of SGA out of 50 births (10%).

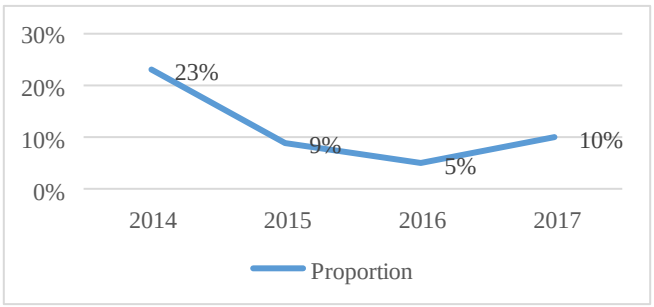

Figure 2. Proportion of infant outcomes in adolescent pregnancy at Dr. Soetomo Hospital in 2014 – 2017

Characteristics of intrinsic factors (comorbidities)

In cases of adolescent pregnancies with SGA outcomes, some cases outcomes were influenced by the presence of intrinsic factor which was comorbidities. Only few cases of adolescent pregnancies without any comorbidities had SGA outcomes. In 2014, there were 5 cases of SGA, with 1 case of mother suffering from eclampsia, 1 case of mother with antepartum bleeding ec placenta previa totalis and 3 others without comorbidities. In 2015, there were 7 cases of SGA, 6 cases of mothers suffering from severe preeclampsia, 1 case without any comorbidities. In 2016, there were 2 cases of SGA, 1 case of mother with severe preeclampsia and 1 case without comorbidities. In 2017, there were 5 cases of SGA, 2 cases of mothers suffering from eclampsia and 3 other cases with mothers suffering from severe pre-eclampsia. From these data, it could be concluded that SGA cases in adolescent pregnancies occurred in mothers suffering from severe preeclampsia as shown in the Figure 3 below.

Data in Dr. Soetomo Hospital stated that 130 cases of adolescent pregnancy (70.7%) of the total 184 deliveries were preterm deliveries. In 2014, there were 20 preterm cases (90.9%) of the total 22 cases of adolescent pregnancy. In 2015, there were 50 preterm cases (67.6%) of a total of 74 cases of adolescent pregnancy. In 2016, there were 26 preterm cases (68.4%) of a total of 38 cases of adolescent pregnancy. In 2017, there were 34 preterm cases (68%) of a total of 50 cases of adolescent pregnancy.

The average number of preterm delivery with comorbidities including severe preeclampsia was 36 cases (19.56%) over the last 4 years while the average for eclampsia was 19 cases (10.32%) over the last 4 years. The incidence of severe preeclampsia in adoles-cent pregnancy initially increased sharply in 2014 to 2015, total cases were 2.5 times larger from the previous year. However, from 2015 to 2017, the trend declined each years from 21.6% to 20%. Unlike severe preeclampsia, cases of eclampsia showed fluctuation in number every year. Between 2016 and 2017, there was a significant increase from 7.9% to a two times higher percentage in 2017 (14%).

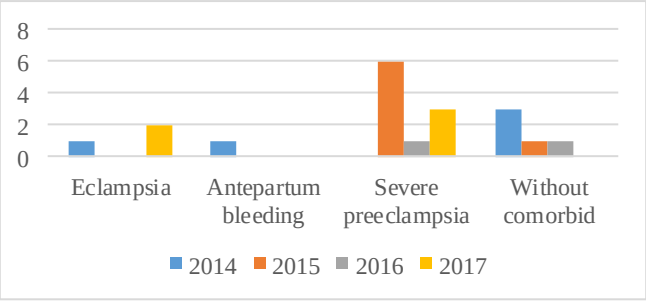

Figure 3. Characteristics of intrinsic factors (comorbidities) in adolescent pregnancy

Table 4. Total of preterm labors, severe preeclampsia and eclampsia cases in adolescent pregnancy

Year	Preterm Labors	Severe Preeclampsia	Eclampsia	Nulliparous Pregnancy	Multiparous Pregnancy	Total of Adolescent Pregnancy
2014	20 preterm (90,9%) 2 aterm	2 (9,09%)	1 (4,55%)	18 (81.8%)	4 (18.2%)	22
2015	50 preterm (67,6%) 24 aterm	16 (21,62%)	8 (10,81%)	70 (94.6%)	4 (5.4%)	74
2016	26 preterm (68,4%) 12 aterm	8 (21,05%)	3 (7,89%)	35 (92.1%)	3 (7.9%)	38
2017	34 preterm (68%) 16 aterm	10 (20%)	7 (14%)	43 (14%)	7 (14%)	50
Total	130 preterm (70,65%) 54 aterm	36 (19,56%)	19 (10,32%)	166	18	184

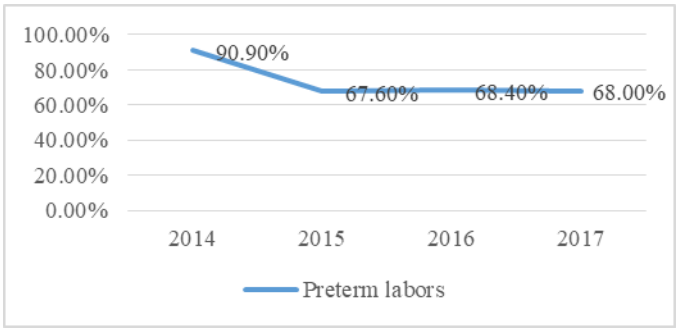

Figure 4. Preterm labors in adolescent pregnancy

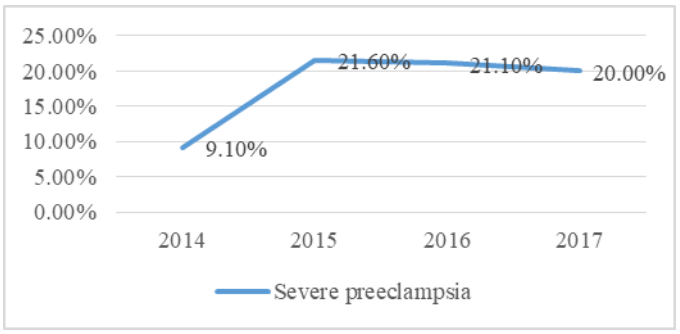

Figure 5. Cases of severe preeclampsia in adolescent pregnancy

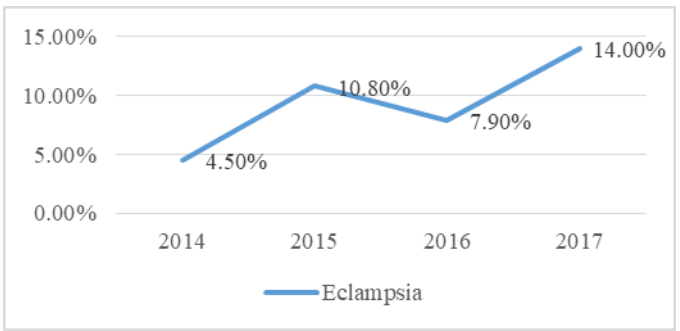

Figure 6. Cases of eclampsia in adolescent pregnancy

Table 5. Comparison of characteristics in adolescent and non-adolescent pregnancy

	2014	2015	2016	2017
Total labors in adolescent pregnancies	22	74	38	50
Total labors	1829	1287	1285	1369
Total LBW cases in adolescent pregnancies	22	74	38	50
Total LBW cases in non-adolescent pregnancies	582	568	596	604
Total p<10 in adolescent pregnancies	5	7	2	5
Total p<10 in non-adolescent pregnancies	125	76	66	62
Total severe preeclampsia cases in adolescent pregnancies	2	16	8	10
Total severe preeclampsia cases in non-adolescent pregnancies	325	271	397	258
Total preterm labors in adolescent pregnancies	20	50	26	34
Total preterm labors in non-adolescent pregnancies	387	379	477	411

Table 6. Crosstab relationship of adolescent pregnancy and incidence of low birth weight infants

	Adolescent pregnancy	Non-adolescent pregnancy	Total	P value
LBW P<10	19	239	348	0.218
LBW P>10	184	2350	2534	
Total	203	2679	2882	

According to the table above, there were 19 cases of adolescent pregnancies which had LBW outcome of p <10 and 329 cases of non-adolescent pregnancies which had LBW outcome of p <10. In addition, there were 184 cases of adolescent pregnancy with non-LBW outcome and 2350 cases of non-adolescent pregnancy with non-LBW outcome. After running SPSS analysis with the Chi Square crosstab, the obtained value of P = 0.218 (P>0.05) meaning that there was no relationship between adolescent pregnancy and the incidence of low birth weight infants.

DISCUSSION

The incidence of adolescent pregnancy delivery at Dr. Soetomo Hospital, Surabaya in 2014 – 2017 were as many as 184 cases (3.19%) out of the total 5770 deliveries over 4 years. In 2017, there were 50 cases out of a total of 1369 deliveries (3.65%). This incidence rate decreased compared to the incidence of adolescent pregnancy globally which reached 47 cases per 1000 women in 2015.[10] According to Mueller et al, the CDC (National Center for Health Statistics) in 2015 from the total number of births in the US, 229.715 babies were born to mothers aged 15 – 19 years old with birth rate of 22.3 per 1.000 women of that age. This number is 8% lower compared to 2014. Birth rate decreased by 9% in women aged 15 – 17 years old and 7% in women aged 18 – 19 years old.[11]

The highest incidence of adolescent pregnancy in Surabaya happened in 2015, 74 cases (5.75%) were found out of 1287 labors. Meanwhile, the lowest number incidence was found in 2016 with cases of adolescent pregnancy as many as 38 cases (2.96%) out of 1285 total labors. The average age for first marriage was 16 years old. This number was still higher compared to the data from Riskesdas 2013. Based on the 2013 Basic Health Research (Riskesdas), proportion of pregnancies in the age of 10 – 54 years old in Indonesia was 2.68%, this was found higher in urban areas (2.8%) compared to rural areas (2,55%).[6] This is of course a problem that should be prioritized in order to reduce the high incidence rate, considering that Indonesia is predicted to have a demographic bonus in 2020 – 2030 which is defined as a condition when there is large population of people in productive age with small number of children and small proportion of elderly. The productive age group in 2020 – 2030 is today's youth. Therefore, the quality of adolescents today greatly affects the demographic bonus.[12]

There are many adolescents who got engaged in risky behavior such as smoking, using drugs, using alcohol, free sex, dropping out of school, unwanted pregnancy, unemployment and criminality. One of the main things is free sex. Pre-marital sex in adolescents is at risk for early pregnancy and transmission of sexually transmitted diseases. Unplanned pregnancies in young girls can lead to abortion and early marriage. These risks will have an impact on the future of the teens themselves, the unborn child and the family.

According to Wallace et al, adolescent pregnancy had an effect on the occurrence of preeclampsia, preterm delivery and the occurrence of low birth weight infants. According to WHO, birth weight was infant's body weight measured for the first time after delivery. Low birth weight could be defined as infant's weight under 2500 grams regardless of his gestational age either preterm or term.[13] Data in Dr. Soetomo Hospital, Surabaya stated that from 2014 to 2017 there were 118 out of 184 infants born from adolescent pregnancies with birth weight under 2500 grams. The incidence of LBW infants in Dr. Soetomo, Hospital over the last 4 years was still much higher than the research conducted by Barker et al. A research on humans was carried out by Baker et al., the sampling included 787 pregnant adolescents and LBW was found in 10.4% of the study subjects.[14]

LBW itself can be classified into 2 categories, which are appropriate for gestational age (pure prematurity/AGA) and small for gestational age (SGA). Infants with pure prematurity are defined as infants with gestational age under 37 weeks and body weight within the normal range for their gestational age, while physically showing signs of prematurity. On other hand, small for gestational age is defines as infants with body weight smaller than the expected weight during certain gestational age (Lubchenko score under 10th percentile).[15]

There were 19 cases of adolescent pregnancy out of a total of 184 deliveries (10%) with outcome of SGA infants (p <10). In 2014, there were 5 outcomes of SGA

infants from a total of 22 deliveries (23%). In 2015, there were 7 outcomes of SGA infants from a total of 74 deliveries (9%). In 2016, there were 2 outcomes of SGA infants from a total of 38 deliveries (5%). In 2017, there were 5 outcomes of SGA infants from a total of 50 deliveries (10%). Out of 19 outcomes, 10 cases of SGA (52.6%) were the outcome of mothers with severe preeclampsia. This is consistent with a study conducted by Kozuki, et al. which stated that nulliparous women aged under 18 years old had a significant risk of developing SGA infants, this risk was 1.8x more likely in adolescent pregnancy than pregnancy in adulthood.[5]

Data in Dr. Soetomo Hospital showed that out of 184 cases, there were 130 cases of adolescent pregnancy (70.7%) which experienced preterm births. In 2014, there were 20 preterm births (90.9%) of the total 22 cases of adolescent pregnancy. In 2015, there were 50 preterm cases (67.6%) out of 74 cases of adolescent pregnancy. In 2016, there were 26 preterm cases (68.4%) out of 38 cases of adolescent pregnancy. In 2017, there were 34 preterm cases (68%) out of 50 cases of adolescent pregnancy. According to the figure made out of these data, there was 30% decrease to these cases in 2014 to 2015. However, in the last 3 years, this number tended to remain, and was still more than 50% of cases. This result was in accordance to the theory from Kozuki, et al (2013) which stated that adolescent pregnancy was closely related to preterm labor and the incidence of preeclampsia.[5]

Over the last four years, the average preterm cases were followed by comorbidities including severe preeclampsia in 36 cases (19.56%) and eclampsia in 19 cases (10.32%). The incidence of severe preeclampsia in adolescent pregnancy initially experienced a very sharp increase in 2014 to 2015, this increase was 2.5 times higher than the previous year. However, from 2015 to 2017, this number tended to decline every year, from 21.6% to 20%. Unlike the case of eclampsia, this case tended to fluctuate every year. Last year, from 2016 to 2017, there was a significant increase from 7.9% to almost a 2 times higher number (14%). After analyzing the data on the relationship between adolescent pregnancy and the incidence of low birth weight, obtained P value was 0.218, which meant that there was no relationship between adolescent pregnancy and the incidence of low birth weight infants.

Other factors related to adolescent pregnancy outcomes included preterm delivery, early pregnancy, severe preeclampsia and eclampsia. These factors could be either antenatal or post natal factors. Antenatal factors included low education, lack of antenatal care, lack of nutrition, increased suicide attempts, increased incidence of sexually transmitted diseases and illegal abortion. Meanwhile, post-natal factors could cause postpartum depression, anxiety disorders, child neglect, decreased exclusive breastfeeding, and weak interpersonal relationships therefore it could be easy for a divorce to occur due to unstable emotions. However, in this study, authors did not examine the association between antenatal and postnatal factors on adolescent pregnancy.

CONCLUSION

The number of adolescent pregnancy deliveries at Dr. Soetomo Hospital in 2014-2017 was 184 cases (3.19%) out of total births of 5770. The number of LBW infants outcomes in adolescent pregnancy at Dr. Soetomo Hospital in 2014-2017 period was 184 cases (7.83%) out of total 2350 cases. The number of teenage pregnancy outcomes with P <10 at Dr. Soetomo Hospital in 2014 - 2017 was 19 cases (5.78%) out of a total of 329 cases. Obtained P value = 0.218 (p> 0.05) could be concluded that there was no relationship between teenage pregnancy and the incidence of LBW.

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