Obstetric Outcome in Adolescents-(A Single Centre Experience Over 10 Years from Jan 2006-Dec 2015)

Ahlam Ali Saif Al Hinai¹, Abdulrahman Al Farsi², Safa Khalfan Said Al Kitani³ and Rajaa Mohammed Salim Al Hadrami⁴

¹Resident, Obstetrics and Gynaecologic Residency Training Program, Oman Medical Specialty Board, Muscat, Oman.
²Senior Consultant, Royal Hospital, Muscat, Oman.
³Medical Intern Royal Hospital.
⁴Medical Intern Royal Hospital.

Abstract
The aim of this study is to determine whether young adolescents aged 11-19 years have an increased risk of cesarean or operative delivery, as well as maternal or neonatal delivery-related morbidity, compared to young adults aged 20-24 years in the tertiary hospital Royal Hospital in period from January 2006 to December 2015. It is a retrospective cohort study and we include all women delivered in Royal Hospital in that period of time and aged from 14 to 25 years and gestational age more than 24 weeks singleton pregnancy and cephalic presentation during labour. We exclude maternal Age > 25 years and Gestation age ≤24 weeks, Non-cephalic presentation and Multiple pregnancy. By this study, there is no significant outcome complication among adolescent age group pregnancy compare to adult group except IUGR and NICU admissions.

Introduction
Multiple studies demonstrate that childbearing is associated with greater health consequences for teens than for adult women. The occurrence of preterm delivery, low birthweight, hypertension, preeclampsia and eclampsia, anemia, and neonatal death are all higher among teens compared to 20 to 29 years old, with increased risk of low birthweight and preterm delivery in the youngest adolescent age groups. Although data regarding pregnancy among adolescents <15 years of age are limited, this population has been shown to be less likely to have adequate prenatal care and more likely to have increased risks of intrauterine growth restriction, preterm delivery, stillbirth, and infant death.

It has been hypothesized that adolescents <15 years of age may have an increased risk of cesarean and operative vaginal delivery compared to adult women, possibly due to cephalopelvic disproportion resulting from underdeveloped bone structures. Multiple large database studies have demonstrated a decreased risk of cesarean delivery among teens; however, many of these studies have used samples composed primarily of adolescents age ≥16 years, with fewer young adolescents represented. One study among young adolescents <15 years-old, specifically, found an increased risk of cesarean, although the effect was limited to those with normal-weight or macrocosmic infants. Two studies suggest an increased risk of birth trauma in the youngest adolescents, with higher risk of emergency cesarean delivery, perineal trauma, and forceps-assisted delivery compared to older teens with infants at comparable birthweight and gestational age.

Other study showed that in adolescent pregnancies the caesarean section rate was lower than in adult pregnancies. As far as the prevalent cause of cesarean section is concerned, it was repeat caesarean section for adults while in adolescents it was failure of labour to progress [1].

Other study of Adverse Maternal and Neonatal Outcomes in Adolescent Pregnancy. To investigate the outcomes of adolescent pregnancy. It was Retrospective cohort study from the Consortium on Safe Labor between 2002 and 2008 in Twelve clinical centers with 19 hospitals in the United States. Include total of 43,537 younger than 25 years of age, including 1189 younger adolescents (age ≤ 15.9 years), 14,703 older adolescents (age 16-19.9 years), and 27,645 young adults (age 20-24.9 years). They Adjusted odds ratio (or) with 95% confidence interval (CI) were calculated, controlling
for maternal characteristics and pregnancy complications (young adults as a reference group). It concludes that Adolescents were less likely to have a cesarean delivery. Failure to progress or cephalopelvic disproportion occurred less frequently in older adolescents. Adolescents who entered spontaneous labor had a shorter second stage of labor [2].

So the aim of this study is to determine whether young adolescents aged 11-19 years have an increased risk of cesarean or operative delivery, as well as maternal or neonatal delivery-related morbidity, compared to young adults aged 20-24 years in the tertiary hospital Royal Hospital in period from January 2006 to December 2015.

Objectives
The primary objective is adolescent pregnancy significantly associated with poor maternal & fetal outcome as compared to adult pregnancies? And the secondary objective: What are the determinants of poor maternal and fetal outcome in adolescent pregnancies?

Methods
After ethical approved from Royal hospital, we conduct this study of Obstetric outcome in adolescents in a single Centre experience (Royal hospital) over 10 years from January 2006 to December 2015.

It is a retrospective cohort study and we include all women delivered in royal hospital in that period of time and aged from 14 to 25 years and gestational age more than 24 week’s singleton pregnancy and cephalic presentation during labour. We exclude maternal Age > 25 years and Gestation age ≤24 weeks, Non-cephalic presentation and Multiple pregnancy. Patient consent not involved as patient name and ID not appear in the study

There were total of 7000 pregnancies in that period. We exclude 4000 pregnancies which were not fit in inclusion criteria. Out of remaining 3000, there were only 180 cases of adolescent age pregnancies which fit in our criteria. So Our Sample size is 540 women including 360 women of adult age and 180 women of adolescent age with ratio 2:1 of adult to adolescent

Statistical Analysis
All data were collected using SPSS. Qualitative data were expressed as frequency and percentage. Chi-square test was used for the analysis. P value < 0.05 was considered as statistically significant.

Results and Discussion
Our Sample size is 540 women including 360 women of adult age and 180 women of adolescent age with ratio 2:1 of adult to adolescent.

Out of 540 cases, there were 25 cases (13.5%) of anemia in adolescent age group compared to 44 (12.3%) in adult group with P value of 0.686. There were 20 cases (10.8%) of infection in adolescent age group compared to 41 (11.5%) in adult group with P value of 0.887. There were 6 cases (3.2%) of GDM in adolescent age group compared to 19 (5.3%) in adult group with P value of 0.388. There were 5 cases (2.7%) of pre-eclampsia in adolescent age group compared to 10 (2.8%) in adult group with P value of 1.000. There were 4 cases (2.2%) of eclampsia in adolescent age group compared to 3 (0.8%) in adult group with P value of 0.237. There were 24 cases (13.0%) of pre-term labor in adolescent age group compared to 33 (9.2%) in adult group with P value of 0.186.

There were 6 cases (3.2%) of Congenital anomalies in adolescent age group compared to 14 (3.9%) in adult group with P value of 0.813. There were 20 cases (10.8%) of IUGR in adolescent age group compared to 19 (5.3%) in adult group with P value of 0.023. There were 2 cases (1.1%) of IUFD in adolescent age group compared to 2 (0.6%) in adult group with P value of 0.609. The mean±Sd of gestational age at the time of delivery in adolescent age group was 38.15±3.37 compare to 38.67±2.24 in adult group with P value of 0.058. There were 156 case (84.3%) of spontaneous vaginal delivery in adolescent age group compared to 285 (79.8%) in adult group, there were 17 case (9.2%) of vacuum delivery in adolescent age group compared to 35 (9.8%) in adult group, there were 0 case (0.0%) of forceps delivery in adolescent age group compared to 1 (0.3%) in adult group, there were 12 case (6.5%) of cesarean section in adolescent age group compared to 36 (10.1%) in adult group with P value of 0.449.

There were 5 cases (2.7%) of perineal trauma in adolescent age group compared to 10 (2.8%) in adult group with P value of 1.000. There were 8 cases (4.3%) of PPH in adolescent age group compared to 9 (2.5%) in adult group with P value of 0.300. There were 20 cases (10.8%) of low birth weight in adolescent age group compared to 31 (8.7%) in adult group with P value of 0.440. There were 21 cases (11.4%) of NICU admission in adolescent age group compared to 18 (5.0%) in adult group with P value of 0.009. There were 1 cases (0.5%) of still birth in adolescent age group compared to 6 (1.7%) in adult group with P value of 0.432.

From the above date: Statistically significant complication in adolescent age group are Intra Uterine Growth Restriction (IUGR) with P value 0.023 and Neonatal Intensive Care Unit (NICU) admission with P value 0.009. as we can show in following graphs:
| Age Group          | 14-19 years n(%) | 20-24 Years n(%) | p value |
|--------------------|------------------|------------------|---------|
| Anemia             | Yes              | 25 (13.5)        | 44 (12.3) | 0.686   |
|                    | No               | 160 (86.5)       | 313 (87.7) |         |
| Infection          | Yes              | 20 (10.8)        | 41 (11.5)  | 0.887   |
|                    | No               | 165 (89.2)       | 316 (88.5) |         |
| GDM                | Yes              | 6 (3.2)          | 19 (5.3)   | 0.388   |
|                    | No               | 197 (96.8)       | 338 (94.7) |         |
| Pre-eclampsia      | Yes              | 5 (2.7)          | 10 (2.8)   | 1.000   |
|                    | No               | 180 (97.3)       | 347 (97.2) |         |
| Eclampsia          | Yes              | 4 (2.2)          | 3 (0.8)    | 0.237   |
|                    | No               | 181 (97.8)       | 354 (99.2) |         |
| Pre-term labor     | Yes              | 24 (13.0)        | 33 (9.2)   | 0.186   |
|                    | No               | 161 (87.0)       | 324 (90.8) |         |
| Congenital anomalies| Yes             | 6 (3.2)          | 14 (3.9)   | 0.813   |
|                    | No               | 179 (96.8)       | 343 (96.1) |         |
| IUGR               | Yes              | 20 (10.8)        | 19 (5.3)   | 0.023*  |
|                    | No               | 165 (89.2)       | 338 (94.7) |         |
| IUFD               | Yes              | 2 (1.1)          | 2 (0.6)    | 0.609   |
|                    | No               | 183 (98.9)       | 355 (99.4) |         |

| Age Group          | Mean±Sd          | 14-19 years n(%) | 20-24 Years n(%) | p value |
|--------------------|------------------|------------------|------------------|---------|
| Gestational age at the time of delivery | 38.15±3.37 | 38.67±2.24 | 0.058   |
| Mode of delivery   | 156 (84.3)       | 285 (79.8)       | 0.449   |
|                    | 17 (9.2)         | 35 (9.8)         |         |
|                    | 0 (0)            | 1 (0.3)          |         |
|                    | 12 (6.5)         | 36 (10.1)        |         |
| Perineal trauma    | Yes              | 5 (2.7)          | 10 (2.8)   | 1.000   |
|                    | No               | 180 (97.3)       | 347 (97.2) |         |
| PPH                | Yes              | 8 (4.3)          | 9 (2.5)    | 0.300   |
|                    | No               | 177 (95.7)       | 348 (97.5) |         |
| Low Birth Weight   | Yes              | 20 (10.8)        | 31 (8.7)   | 0.440   |
|                    | No               | 165 (89.2)       | 326 (91.3) |         |
| NICU admission     | Yes              | 21 (11.4)        | 18 (5.0)   | 0.009*  |
|                    | No               | 164 (88.6)       | 339 (95.0) |         |
| Still birth        | Yes              | 1 (0.5)          | 6 (1.7)    | 0.432   |
|                    | No               | 184 (99.5)       | 351 (98.3) |         |
Table 1. Comparison of Adolescent pregnant women with young adult pregnant women
Test: Chi-square test/Independent samples t-test
*Statistically significant

**Limitation**
This study involves only small sample size and done in Single center. If the study done in multicenter and involve lager sample size, the result could be more significant. Also other excluded criteria like abortion, other fetal and maternal complication can be included or involved in separate study.

**Conclusion**
There is no significant outcome complication among adolescent age group pregnancy compare to adult group except IUGR and NICU admissions Adolescent pregnancies and deliveries are almost safe. The only significant complication we found was IUGR and NICU admission [3-23].

**References**
1. Kellartzis D, Tsolakidis D, Mikos T, Vavilis D, Tzevelekis V, et al. (2013) Obstetric outcome in adolescence: a single centre experience over seven years. Clin Exp Obstet Gynecol 40: 49-51.
2. Kawakita T, Wilson K, Grantz KL, Landy HJ, Huang CC, et al. (2016) Adverse Maternal and Neonatal Outcomes in Adolescent Pregnancy. J Pediatr Adolesc Gynecol 29: 130-136.
3. Fayed AA, Wahabi H, Mamdouh H, Kotb R, Esmaeil S (2017) Demographic profile and pregnancy outcomes of adolescents and older mothers in Saudi Arabia: analysis from Riyadh Mother (RAHMA) and Baby cohort study. BMJ Open 7: 016501.
4. Lisonkova S, Pots J, Muraca GM, Razaz N, Sabr Y, et al. (2017) Maternal age and severe maternal morbidity: A population-based retrospective cohort study. PLoS Med 14: 1002307.
5. Steenkamp M, Boyle J, Kildea S, Moore V, Davies M, et al. (2017) Perinatal outcomes among young Indigenous Australian mothers: A cross-sectional study and comparison with adult Indigenous mothers. Birth Berkeley Calif 44: 262-271.
6. Narukhutrpichai P, Khruutmuang D, Chattrapiban T (2016) The Obstetrics and Neonatal Outcomes of Teenage Pregnancy in Naresuan University Hospital. J Med Assoc Thail Chotmaith Thangphaet 99: 361-367.
7. Pun KD, Chauhan M (2011) Outcome of adolescent pregnancy at Kathmandu University Hospital, Dhulikhel, Kavre. Kathmandu Univ Med J KUMJ 9: 50-53.
8. Medhi R, Das B, Das A, Ahmed M, Bawri S, et al. (2016) Adverse obstetrical and perinatal outcome in adolescent mothers associated with first birth: a hospital-based case-control study in a tertiary care hospital in North-East India. Adolesc Health Med Ther 7: 37-42.
9. Egbe TO, Omeichu A, Halle Ekane GE, Tchente CN, Egbe EN, et al. (2015) Prevalence and outcome of teenage hospital births at the Buea Health District, South West Region, Cameroon. Reprod Health 12: 118.
10. Minjares-Granillo RO, Reza-López SA, Caballero-Valdez S, Levario-Carrillo M, Chávez-Corrall DV (2016) Maternal and Perinatal Outcomes Among Adolescents and Mature Women: A Hospital-Based Study in the North of Mexico. J Pediatr Adolesc Gynecol 29: 304-311.
11. Suciu LM, Pasc AL, Cucurea M, Bell EF (2016) Teenage Pregnancies: Risk Factors and Associated Neonatal Outcomes in an Eastern-European Academic Perinatal Care Center. Am J Perinatal 33: 409-414.
12. Çetin O, Verit FF, Zebitay AG, Aydin Z, Kurdoğlu Z, et al. (2015) Neither early nor late for becoming pregnant: Comparison of the perinatal outcomes of adolescent, reproductive age, and advanced maternal age pregnancies. Turk J Obstet Gynecol 12: 151-157.
13. Althabe F, Moore JL, Gibbons L, Beruetta M, Goudar SS, et al. (2015) Adverse maternal and perinatal outcomes in adolescent pregnancies: The Global Network’s Maternal Newborn Health Registry study. Reprod Health 12: S8.
14. Pergialiotis V, Vlachos D-E, Gkioka E, Tzotra K, Papantoniou N, et al. (2015) Teenage pregnancy antenatal and perinatal morbidity: results from a tertiary centre in Greece. J Obstet Gynaecol J Inst Obstet Gynaecol 35: 595-599.
15. Ganchimeg T, Ota E, Morisaki N, Laopaiboon M, Lumbiganon P, et al. (2014) Pregnancy and childbirth outcomes among adolescent mothers: a World Health Organization multicountry study. BJOG Int J Obstet Gynaecol 121: 40-48.
16. Naz U (2014) Comparison of obstetric outcome in terms of the risk of low birth weight, preterm delivery, cesarean section rate and anemia in primigravid adolescents and older primigravida. J Coll Physicians Surg--Pak JCPSP 24: 131-134.
17. Chibber R, Fouda M, Al-Hiji J, Al-Dossary M, Sadeq H, et al. (2014) Adverse pregnancy outcome among teenagers: a reality? J Obstet Gynaecol J Inst Obstet Gynaecol 34: 297-300.
18. Ventura SJ, Hamilton BE, Matthews TJ (2014) National and state patterns of teen births in the United States, 1940-2013. Natl Vital Stat Rep 63: 1-34.
19. Fraser AM, Brockert JE, Ward RH (1995) Association of young maternal age with adverse reproductive outcomes. N Engl J Med 332: 1113-1117.
20. Gortzak Uzan L, Hallak M, Press F, Katz M, Shoham Vardi I (2001) Teenage pregnancy: risk factors for adverse perinatal outcome. J Matern Fetal Med 10: 393-397.
21. Chen XK, Wen SW, Fleming N, Demissie K, Rhoads GG, et al. (2007) Teenage pregnancy and adverse birth outcomes: a large population-based retrospective cohort study. Int J Epidemiol 36: 368-373.
22. T Ganchimeg, E Ota, N Morisaki, M Laopaiboon, P Lumbiganon, et al. (2014) Pregnancy and childbirth outcomes among adolescent mothers: A World Health Organization multicountry study. Br J Obstet Gynaecol 121: 40.
23. Hogue M, Hogue S (2010) Comparison of perinatal and obstetric outcome in adolescence: a single centre experience over seven years. Clin Exp Obstet Gynecol 40: 49-51.