Pregnancy Outcome in Ladies Aged 40 Years and Above

Mahabat S. Saeed[1]✎, Atiya K. Mohammed[1], Rowshan J. Azeez[1]

[1]College of Midicin & College of Nursing, Sulimani University

Abstract: Many women today are delaying childbearing until the fourth decade of life. The reasons for these delays are multiple and include pursuance of professional careers and delaying of marriage. To study the impact of the maternal age on pregnancy outcome in ladies ≥40 years old. This is a prospective observational case control study conducted at Sulaimania Maternity Teaching Hospital. Time of data collection was from 1st of December 2013 to the 1st of June 2014. A total of 300 women were included in the study, 150 cases aged 40 and above as a study group and 150 cases aged 20-29 as a control group, these cases were collected from labour room and operative theatres. All the women included in the study, gave verbal consent and the following informations were obtained by questionnaire forms :

Age, parity, gestational age of her pregnancy by LMP and US, any complications during pregnancy like PET, GDM, PIH, PROM, APH, PPH, past medical history, past surgical history and obstetrical history has been also recorded.

Duringlabour fetal heart rate monitoring was done with intermittent auscultation by sonic aid only, if meconium detected in the liquor or any fetal HR abnormality then continuous (FHR) monitoring was done until delivery.
Mode of delivery by vaginal delivery (normal or operative vaginal delivery) or by caesarean section and its indications were also recorded.

Fetal outcome was measured by APGAR scores at 1st& 5th minute, birth weight, admission to neonatal care unit, and during the period of admission observation of development of any neonatal complications including respiratory distress, meconium aspiration syndrome, neonatal death or improvement and discharge were recorded.

After discharge from NCU and hospital, follow up of the babies for one month was done by phone calling of the family of the baby and asking about his/her health and if developed any complications or readmitted again to hospital these information also were recorded.

A total of 150 cases aged from 20-29 women were enrolled in the study as a control group and 150 cases aged 40 and more were enrolled as a study group. Mean gestational age of the study group was 37.4 ± 2.0 weeks and 38.4 ± 1.7 weeks in the control group, the difference was statistically highly significant, P<0.01. Gestational diabetes, pre-eclampsia, placenta abruption were significantly higher in the study group (26.0%, 45.3%, 8.7%, respectively) compared to control group (11.3%, 16.0%, 1.3% respectively). Caesarean deliveries were high (61.3%) in the study group and it was much higher with history of previous caesarean (48.9%). Incidence of PPH was higher in the study group (30.7%) compared to (16.0%) in control group. APGAR at fifth minute was approximately similar in both groups and statistically was not significant. Admission to neonatal care unit NCU was (50.7%) in study group compared to (16.0%) in control group. Neonatal mortality was high (1.3%) in study group than control group(0.0%).

Study conclude Women aged 40 years and above have increased risk of complications during pregnancy and they have a higher risk of operative delivery. Despite of these complications and increased of maternal morbidity in the older women, the overall neonatal outcome did not appear to be affected.

Keywords: Pregnancy, maternal age ≥ 40, maternal outcome, fetal outcome.

✎ **Atiya K. Mohammed (Correspondence)**
✉ atiyakareem@yahoo.com
☎ +

Introduction

All over the world women are delaying childbearing for various reasons. Pursuit of a career or financial goals, better contraception, longer life expectancy, higher education, etc., have been mentioned as possible reasons for this phenomenon.Pregnant women older than 40 years old are considered of advanced age and also at increased risk for complications during pregnancy and labour. The Increased incidence of preterm labour, hypertensive disorders, caesarean birth, and maternal and perinatal mortality have been reported. However, it has also been suggested that, if these women do not have hypertension or diabetes, the course and outcome of pregnancy will be comparable to that in gravidas of younger age. The average maternal mortality rate (MMR) throughout the world amounts to about 10-20 per 10^5 live births and increases as a function of maternal age [1].

The most important causes of pregnancy-related MMR are: Pulmonary embolism, Pre-eclampsia, hemorrhage, Infection, Ectopic pregnancy [2].

Common age-related disease states

It is generally assumed that women ≥40 years have an increased risk for complications during pregnancy. However, most reported age-related risk factors are only indirectly related to age through their association with age dependent confounders such as hypertension, diabetes, high parity, uterine myomas and a history of infertility. Among them, hypertension and diabetes will be discussed separately as they are not only characterized by a high prevalence in the ageing general population, but also by important implications for pregnancy [3].

Impact of advanced maternal age on the mode of delivery

Data reported on the relationship between prematurity and maternal age are conflicting, some providing evidence for a rise, others for a fall, with age. Recently, it has been demonstrated that the rate of caesarean births increases with age, irrespective of parity[2].

Apparently, the probability of delivering vaginally decrease with advancing age. In part, this phenomenon can be explained by a higher caesarean section rate in conjunction with following confounders:fetal distress, multiple pregnancy (multiple ovulation), non-vertex presentation (e.g.leiomyomas), macrosomia (gestational diabetes), placenta praevia (multiparity) and repeat Caesarean (multiparity). Other reported medical reasons to deliver a patient of advanced age by caesarean section are contracted pelvis and maternal distress[4].

Perinatal mortality

Perinatal mortality rate (PMR) in older women is in most cases associated with multiparity, low socio-economic status, preterm birth, intra uterine growth restriction, congenital anomalies and peripartum complications such as asphyxia, birth injuries, and infections[5]. In the 1970s and 1980s PMR in ≥40 year old gravidas has decreased from 72 to 14 per 1000 live births. Nevertheless, the age-dependent rise in PMR by about 3% per year of age is still present. Interestingly, there are strong indications to support the view that the entire age-dependent increase in PMR is caused by obstetric complications resulting from age-dependent confounders such as hypertension and diabetes[6].

Impact of maternal age on fetal outcome

The risk of fetal chromosome aneuploidy, primarily trisomies, increases with maternal age[7]. The oocytes reach metaphase I during the fetal period (5 months post-fertilization), and chromosomes remain aligned on the metaphase plate until the oocyte divides prior to ovulation. Age related errors, largely due to dysfunction of the meiotic spindle, increase the risk of non-disjunction, which leads to unequal chromosome products at completion of division. This results in higher rates of aneuploidy embryos, higher rates of spontaneous abortion, and lower chances of successful pregnancy outcome. It is estimated that after the age of 45, the majority of oocytes may be aneuploidy [7].

Gene Abnormalities

The effect of advanced maternal age on single gene disorders and epigenetic events, other than in the clinical area of assisted reproduction, is not well known. Epidemiologic studies have suggested a correlation between autism and advanced maternal and paternal age, but larger studies are needed to understand this association[8].

Congenital Malformation

The risk of certain non-chromosomal birth defects has been shown to increase with maternal age. Advanced maternal age (35 to 45 years) associated with an increased risk for all types of heart defects, tricuspid atresia, right outflow tract defects, hypospadias second degree or higher, male genital defects excluding hypospadias, and craniosynostosis. After excluding infants with chromosomal abnormalities, the incidence of structurally malformed infants increased progressively with maternal age. The risk of clubfoot and diaphragmatic hernia also increased as maternal age increased. Overall, the additional age-related risk of non-chromosomal malformations was approximately 1% in women >35 years of age[9][10].

Impact of maternal age on pregnancy outcome
A large body of literature exists describing the impact of advanced maternal age on pregnancy outcome. When compared with younger women, women > 40 years are at increased risk of spontaneous abortion, ectopic pregnancy, placenta previa, gestational diabetes, eclampsia, and pregnancy-induced hypertension, as well as caesarean section and induction of labour. Perinatal and neonatal death and stillbirth also increase with increasing maternal age. Some of these obstetrical complications appear to be related to the aging process alone, while others are related to coexisting factors such as multiple gestation, higher parity, and underlying chronic medical condition (hypertension, diabetes mellitus and other chronic diseases) that become more prevalent with increasing age[10][11]

There are advantages and disadvantages to parenting when older: there is more anxiety during pregnancy, but parents are more mature and likely to be more financially secure and to have higher levels of education. Overall, if older women can sustain a pregnancy, the pregnancy outcomes can be positive, and parents may be well prepared to cope with the physical and emotional stresses of pregnancy and parenting. Older parents can bring experience, knowledge, and economic resources to the task of child raising, which may suggest a social advantage to delayed parenting[12].

Patients and methods:
This is a prospective observational case control study conducted at Sulaimania Maternity Teaching Hospital.

Time of data collection was from 1st of December 2013 to the 1st of June 2014.A total of 300 women were included in the study, 150 cases aged 40 and above as a study group and 150 cases aged 20-29 as a control group, these cases were collected from labourroom and operative theatres. All the women included in the study, gave verbal consent and the following informations were obtained by questionnaire forms :

Age, parity, gestational age of her pregnancy by LMP and US, any complications during pregnancy like PIH, GDM, PIH, PROM, APH, PPH, past medical history, past surgical history and obstetrical history has been also recorded.

During labour fetal heart rate monitoring was done with intermittent auscultation by sonic aid only, if meconium detected in the liquor or any fetal HR abnormality then continuous (FHR) monitoring was done until delivery. Mode of delivery by vaginal delivery (normal or operative vaginal delivery) or by caesarean section and its indications were also recorded.

Fetal outcome was measured by APGAR scores at 5th minute, birth weight, admission to the neonatal care unit, and during the period of admission observation of the development of any neonatal complications, including respiratory distress, meconium aspiration syndrome, neonatal death or improvement and discharge were recorded.

After discharge from NCU and hospital, follow up of the babies for one month was done by phone calling of the family of the baby and asking about his/her health and if developed any complications or readmitted again to hospital these information also were recorded.

Inclusion criteria of the study: All the women presented to the labour room aged 40 years and above.

Exclusion criteria of the study: socioeconomic status, anemic patients, Late booking.

Statistical analysis: All data analyzed using SPSS (version 20 software) computer program. Statistical analysis included descriptive statistics like: a frequency tables and graphs, including: bar diagrams and pie chart. The mean and SD of the measurements were calculated. To test the relationship between different variables, comparisons were made using Chi-square and t-test.

All p values were based on 2-sided tests, and p < 0.05 was considered statistically significant.

Results:
This study included 300 pregnant women and they were subdivided into two groups, 150 cases aged 40and above (study group) and 150 cases aged 20-29 (control group).

In this study, the mean age of the women in the study group was 41.7 +1.7 years and 23.2 +2.5 years in the control group, the difference was statistically highly significant, P<0.01. The mean gestational age was 37.4+2.0 weeks in the study group compared to 38.4+1.7 weeks in the control group which was statistically highly significant, P<0.05. Mean gravity in the study group was 5+ 2.8 weeks and 2+ 0.7 weeks in the control group the difference was statistically significant, P<0.01 .Mean parity of the study group 3+ 2.2 was significantly higher than of control group, 1.1+0.8 P<0.01 (Table 1).

Table 1. General characteristics of both groups

General characteristics	Study G. Mean $\pm$ SD	Control G. Mean$\pm$SD	P value*
Age	41.7 $\pm$ 1.7	23.2 $\pm$ 2.5	0.01
Gestational age	37.4 $\pm$ 2.0	38.4 $\pm$ 1.7	0.01
Gravity	5 $\pm$ 2.8	2$\pm$ 0.7	0.01
Parity	3$\pm$ 2.2	1.1 $\pm$ 0.8	0.01

* t test

Table 2a. *Complications during pregnancy in studied groups.*

Complication		Study group	Control group	P value
Gestational diabetes	Present	39 (26.0%)	17 (11.3%)	0.001
	Not present	111(74.0%)	133 (88.7%)	
Pregnancy induced hypertension	Present	68 (45.3%)	24 (16.0%)	0.001
	Not present	82 (54.7%)	126 (84.0%)	
Placental abruption	Present	13 (8.7%)	2 (1.3%)	0.003
	Not present	137(91.3%)	148 (98.7%)	
Pre-term pregnancy	Present	25 (16.7%)	9 (6.0%)	0.003
	Not present	125(83.3%)	141 (94.0%)	
Intra-uterine growth restriction	Present	15 (10.0%)	9 (6.0%)	0.202
	Not present	135(90.0%)	141 (94.0%)	
Malpresentation	Malpresentation No-malpresentation	18 (12.0%)	10 (6.7%)	0.112
		132(88.0%)	140 (93.3%)	
PROM	History of PROM No history of PROM	32 (21.3%)	13 (8.7%)	0.002
		118(78.7%)	137 (91.3%)	

* Chi square test.

Table 2a :- Showed the complications during pregnancy of studied andcontrols group. Gestational diabetes was more prevalent in cases (26.0%) than in controls (11.3%), P<0.01. Pregnancy induced hypertension was higher in cases (45.3%) than in controls (16.0%), P<0.01. Placental abruption was more prevalent in cases (8.7%) than in controls (1.3%), P<0.01. Pre-term pregnancy was also higher in cases (16.7%) than in controls (6.0%), P<0.01. Although, the observed frequencies of intra uterine growth retardation and malpresentation were higher in cases (10%, 12.0% respectively) than in controls (6%, 6.7% respectively) the effects of both factors were statistically not significant, P>0.05. Whereas prelabour rupture of membrane (PROM) was higher (21.3%) in cases than in controls (8.7%), P<0.01.

Outcome of multivariate logistic regression analysis showed that there was an association between gestational diabetes, pregnancy induced hypertension, and PROM with complication during pregnancy. Gestational diabetes increased the risk of complication during pregnancy 2.2 times, P<0.05. Preeclampsia increased risk of complication during pregnancy 4.5 times, P<0.01. PROM increased the risk of complication during pregnancy 2.6 times, P<0.05 (Table 2b).

Table 2b. Outcomes of multivariate logistic regression analysis: factor affecting Complications during pregnancy.

Factors	P value	Odds ratio	95% CI	
			Lower	Lower
Gestational diabetes	0.020	2.2	1.13	4.32
Pregnancy induced hypertension	0.001	4.5	2.52	6.36
Placental abruption	0.598	0.9	0.58	1.87
PROM	0.011	2.6	1.22	5.56

In this study, the prevalence of cesarean section was higher in study (61.3%) than in controls(26.0%), while vaginal delivery was higher in controls (74.0%) than in study (38.7%), which was statistically highly significant P<0.01.
In this study, the prevalence of cesarean section was higher in study (61.3%) than in controls(26.0%), while vaginal delivery was higher in controls (74.0%) than in study (38.7%), which was statistically highly significant P<0.01.**Table 3.**

Table 3. Mode of delivery in study group and control group.

Mode of delivery	Study group no. (%)(150)	Control groupno. (%)(150)	P value
			0.001
Cesarean section	92(61.3)	39(26.0)	
Vaginal delivery	58(38.7)	111(74.0)	

Figure 1. Summarized the type of cesarean section in study and controls. Although, the emergency cesarean section conducted in 56.5% of cases and in 71.1% of controls, elective cesarean section was higher incidence in cases 43.5% than in controls 28.9%, the effect of maternal age on the type of cesarean section was statistically not significant, P>0.05.
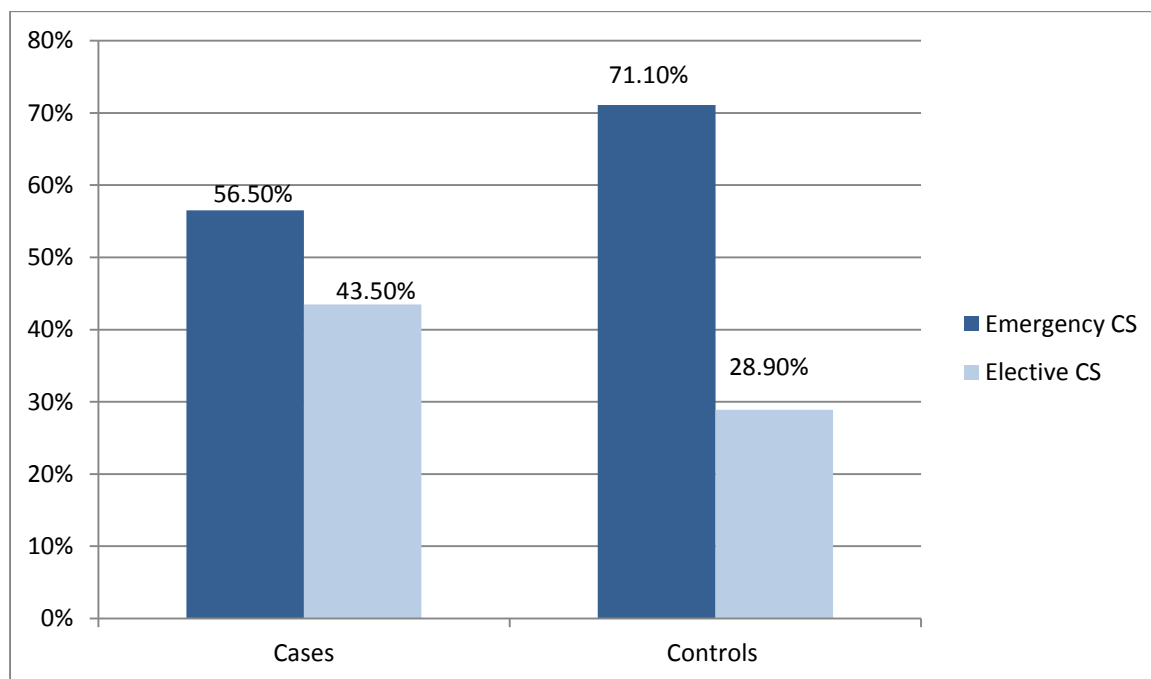

Figure 1. Type of cesarean sections in study group and control group, P=0.088.

Table 4:- Showed the indications of cesarean section in study and controls. The common indication of cesarean section in study group was history of previous cesarean section (48.9%), while the lowest indication of cesarean section was prolonged 2nd stage (3.3%). Whereas the common indications of cesarean section in control group were fetal distress and history of previous cesarean section (27.5%), while the lowest indication of cesarean section were prolonged 2nd stage and malpresantation (12.5%). Table 4.

Table 4. Indication of caesarean section in study group and control group.

Indication of cesarean section	Study group No. (%)	Control group No. (%)
Meconium	12 (13.0)	8 (20.0)
Fetal distress	18 (19.6)	11 (27.5)
Previous CS	45 (48.9)	11 (27.5)
Failure of progress	3 (3.3)	5 (12.5)
Malpresentation	14 (15.2)	5 (12.5)
Total	**92 (100)**	**40 (100)**

Operative vaginal delivery conducted more frequently in the study (22.0%) than in controls (7.2%), while the normal vaginal delivery conducted more frequently in younger women (92.8%) than in older women (78.0%) in this study, P<0.05 (Figure 2).
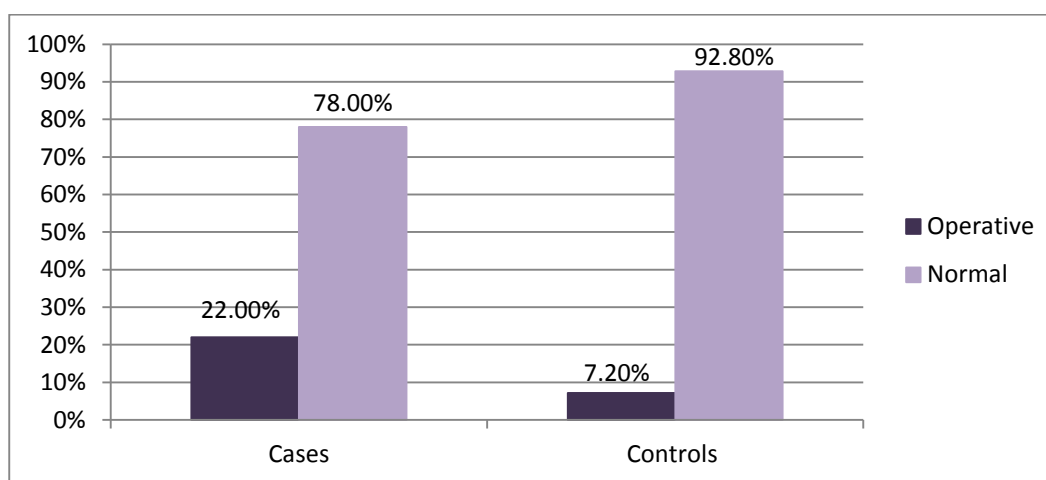
Figure 2. A type of vaginal delivery in study group and control group, P=0.016.

Table 5.Causes of post-partum hemorrhage in case group and control group.

Causes of post-partum hemorrhage	Study group No. (%)	Control group No. (%)
No history	104 (69.3)	126 (84.0)
RPOC	0 (0.0)	2 (1.3)
Atony	31 (20.7)	10 (6.7)
Genital tract trauma	15 (10)	12 (8.0)
Bleeding tendency	0 (0.0)	0 (0.0)
Total	**150 (100)**	**150 (100)**

Figure 3 and 4:- Summarizes the causes and prevalence of post-partum hemorrhage in study and controls..The causes of which include (atony 20.7% and trauma 10%) in the study group.In control group, history of pospartum hemorrhage showed in 16% only and the causes include (atony 6.7%, truma 8%, and RPOC 1.3%).
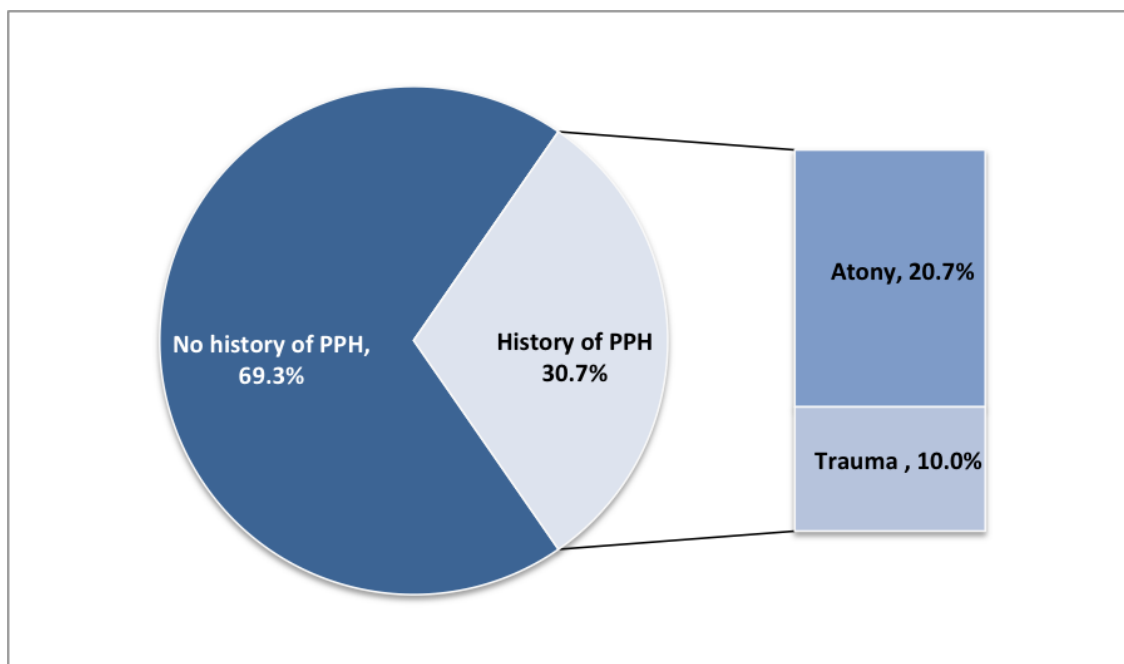
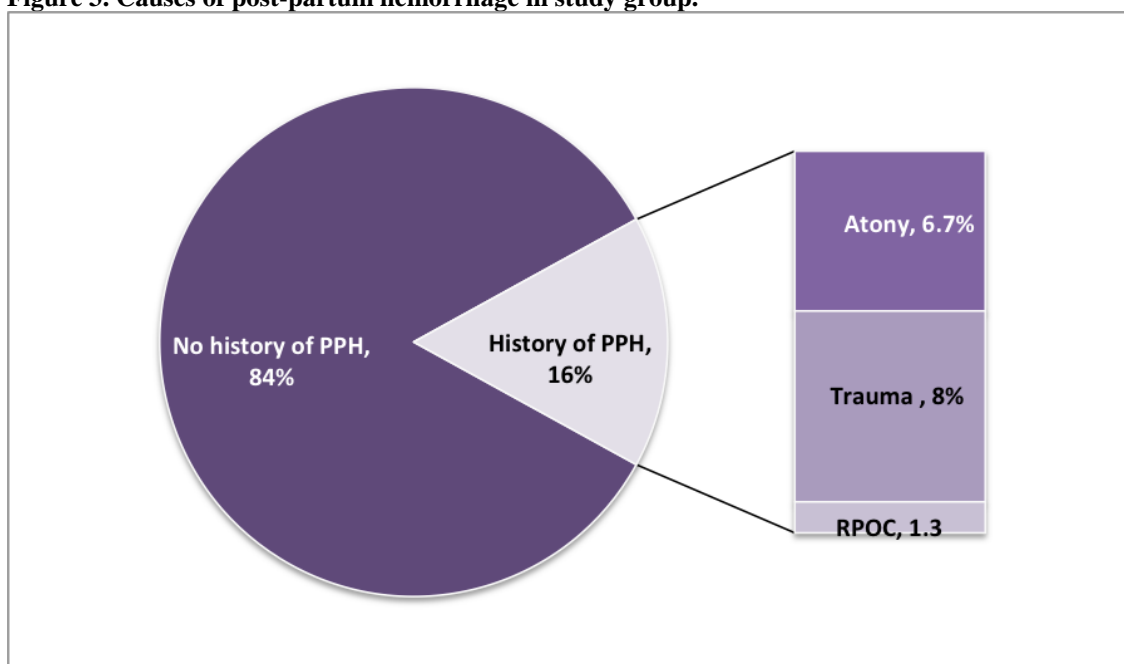**Figure 3. Causes of post-partum hemorrhage in study group.**

Figure 4. Causes of post-partum hemorrhage in control group.

The mean birth weight in study group was 3.06 $\pm$ 0.67 kg and the mean birth weight in control group was 3.39 $\pm$ 0.33 kg, the difference was statistically highly significant (P<0.01). About half of the babies of women in study group were admitted to the neonatal care unit (50.7%) in comparison with only (16.0%) of babies of control group, P<0.01 (Table 5).

Table 6. Weight of babies and admission to neonatal care unit (NCU) in study group and control group women.

Parameter	Study group	Control group	P value
Weight (Kg)			0.001
1 – 2	1 (0.7)	0 (0.0)	
2 – 3	18 (12.0)	1 (0.7)	
3 – 4	85 (56.6)	73 (48.6)	
4 – 5	45 (30.0)	76 (50.7)	
≥ 5	1 (0.7)	0 (0.0)	
Mean birth wt	3.06±0.67	3.39±0.33	
Admission to NCU			0.001
Admitted	76 (50.7)	24 (16.0)	
Not admitted	74 (49.3)	126(84.0)	

Table 7:- Summarizes the indications of admission of babies to neonatal care unit.Premature babies was the commonest cause of admission in both groups (40.8% and 45.8%) respectively.

Table 7. Indication of admission to NCU in study group and control group.

Indication of admission to NCU	Study group	Control group
Premature babies	31 (40.8)	11 (45.8)
Meconium	19 (25.0)	7 (29.2)
Low birth weight	16 (21.1)	1 (4.1)
Instrumental	10 (13.1)	5 (20.9)
Total	**76 (100)**	**24 (100)**

The mean ± SD of APGAR score at 5th minute in the study group was 8.42± 1.14 and in the control group was 8.46 ± 0.62, the difference was statistically not significant (P>0.05). The age of mother did not effect on APGAR score at 5th minute, P>0.240(Table 8).

Table 8.APGAR score of babies in study group and control group.

APGAR score	Study group	Control group	P value
APGAR score 5			0.240
Low (0 – 3)	1 (0.7)	0 (0.0)	
Intermediate (4 –6)	4 (2.7)	1 (0.7)	
Normal (7 – 10)	145(96.6)	149 (99.3)	
Mean APGAR score	8.42 ± 1.14	8.46 ± 0.62	

Admission in neonatal ward was more in study group 22(14.7%) in comparison to control group 18(12%) which was statistically not significant (p >0.05).Birth asphyxia and meconium aspiration syndrome was 0.0% in both groups and neonatal mortality was 2(1.3%) in study group and (0.0%) in control group as shown intable 9.

Table 9.Neonatal mortality and morbidity in study group and control group.

Neonatal mortality and morbidity	Study group	Control group	P value
Birth asphyxia	0 (0.0)	0 (0.0)	0.318
Meconium aspiration Syndrome	0 (0.0)	0 (0.0)	
Neonatal ward admission	22 (14.7)	18 (12.0)	
Mortality	2 (1.3)	0 (0.0)	

Discussion

The present study was done to find out the effect of maternal age on the pregnancy outcome. The mean gestational age in this study was significantly lower in the study group (37.4 $\pm$ 2.0) weeks than control group (38.4$\pm$ 1.7) weeks which was statistically significant and was approximately resemble the results of study done by Ziadeh S[13],who showed in his study the mean gestational age (39.1 $\pm$ 0.4) weeks in the study group which was significantly lower than control group (39.4 $\pm$ 0.04) weeks, while Hoffman MC[14]showed in his study the gestational age similar in both groups (39.0 $\pm$ 3.5) weeks. Mean gravidity in this study was (4.51 $\pm$ 2.8) which was higher than control group (2.1 $\pm$ 0.7), this was accordance with a similar report from Hoffman MC[10]study which include mean gravidity in the study group (4.0 $\pm$ 2.8) and (2.0 $\pm$ 1.7) in the control group.

Complication during pregnancy such as PIH was higher in the study group (45.3%) than control group which was (16.0%). This finding was also showed in Hoffman MC[14]study which revealed the rate of PIH in the study group (9.3%) while in the control group (6.9%), this was in accordance with a similar reports from Jahromi BN[15], Ziadeh S[13].

Gestational diabetes in this study was significantly high in the study group (26.0%) while in the control group was (11.3%) which was statistically significant. JollyM[16]in his study found the rate of GDM higher in the study group (4.56%) while in the control group (1.0%), similar finding were also showed in studies done by Jahromi BN[41], Ziadeh S[13], Hoffman MC[14], Berkowitz[4].

Other pregnancy associated complications including abruptio placenta, preterm labour were higher incidence in study group (8.7%, 16.7%) respectively than control group (1.3%, 6.0%) respectively. These findings were in accordance with similar findings showed in study done by Jolly M[15] in which incidence of abruptio placenta, preterm labour in the study group were (0.63%, 1.58%) respectively while in the control group were (0.45%, 1.03%) respectively, similar finding showed byZiadeh S[13] study.

The prevalence of malpresentation and IUGR were (12.0%, 10.0%) respectively in the study group which were statistically not significant in compare with control group (6.7%, 6.0%) respectively, these findings in contrast to study done by JollyM[16] in which the prevalence of these complications in study group (0.78%, 7.63%) respectively which were significantly higher in compare to control group (0.65%, 5.81%).

The rate of caesarean section delivery was also increased in the study group (61.3%) compare to control group (26.0%) which was statistically significant, these finding were similar to study done by Peipert ,JF.[3] who found the rate of caesarean section in the case group (32.4%) higher than control group (16.8%), similar findings showed by Jolly M[16], Jahromi BN[15], Louise C [17]and Berkowitz[4].

This study revealed that elective caesarean section rate is higher in older women (43.5%) than younger women (28.9%). This is, at least, in part, supported by our observation of increased elective caesarean section rates in older mothers, also Louise C[17] in his study found that the rate of elective caesarean section (19.7%) in the study group was higher in compare to (8.7%) in control group.

Operative vaginal delivery in present study was higher in the older women (22.0%) than younger women (7.20%) similar results observed in study done by YangmeiLI[18] who showed the rate of operative vaginal delivery in older women (21.0%) while in younger women the rate was (17.0%).JollyM[16] study opposite our results who found that operative vaginal delivery higher in younger women (11.36%) than older women (10.23%).

History of previous caesarean section was the most common indication of CS in the study group (48.9%), while fetal distress and previous CS were common indications of CS in control group (27.5%, 27.5%) respectively, while in Berkowitz[4] study found that examining the indications for the caesarean deliveries revealed no increase in the frequency of any particular indication.

Among the cases, the rate of PPH was higher in the study group (30.7%) in compare to control group (16.0%), this finding was similar to JollyM[16] study who revealed the rate of PPH in the older women (17.99%) while in younger women(11.24%).

In this study the mean birth weight in study group (3.06 $\pm$ 0.67) Kg which was significantly lower than control group (3.39$\pm$ 0.33) Kg these findings in accordance to the study done by Ziadeh S[13] who showed mean birth weight in his study group (3.21 $\pm$ 0.5) Kg which was significantly lower than control group (3.32$\pm$ 0.1) Kg, Jahromi BN[15] also found similar result in his study.

In present study, mean APGAR score at 5th minute in this study group was (8.42 $\pm$ 1.14) and in control group was (8.46 $\pm$ 0.62) the difference was statistically not significant (P > 0.05), this is in contrast to studies done by JahromiBN[15] and Berkowitz[4] who showed the incidence of APGAR

score at 5th minute significantly lower in the older women.

Admission in neonatal ward was more in the study group (14.7%) compared to (12.0%) in control group, neonatal mortality was (1.3%) in study group compared to (0.0%) in control group, the cause of death was septicemia one at 4th day of life and other 6th day of life. In JollyM[16] study found higher rate of neonatal ward admission which was (5.92%) in the study group compared to (5.20%) in control group also he found that neonatal mortality higher in the study group (0.81%) in compared to control group (0.47%), Louise C[17] and Jahromi BN[15] revealed in their studies very little evidence of an association between increasing maternal age and risk of neonatal death which were statistically not significant.

Conclusion:
Women aged 40 years and over have increased risk of complications during pregnancy and they have a higher risk of operative delivery. Despite of these complications and increased risk of maternal morbidity in tolder women, the overall neonatal outcome did not appear to be affected.

Recommendations:
1. Delayed child-bearing is associated with increased obstetrical and perinatal complications. Care providers need to be aware of these complications and adjust obstetrical management protocols to ensure optimal maternal and perinatal outcomes.

2. Strategies to improve informed decision-making by prospective parents should be designed, implemented, and evaluated. These strategies should provide opportunity for adults to understand the potential medical, social, and economic consequences of child-bearing throughout the reproductive years.

References:
1) Hansen,J.P.(1986)Older maternal age and pregnancy outcome:A review of literature. Obstet. Gynecol. Surv.,41,736-742.
2) Sach, B.P., Brown, D.A.J., Driscoll, S.G. et al. (1987) Maternal mortality in Massachusetts. New Engl. J. Med., 316, 667-672.
3) Peipert, J.F. and Bracken, M.B. (1993) Maternal age: An independent risk factor for caesarean delivery. Obstet. Gynecol., 81, 200-205.
4) Berkowitz, G.S., Skovron. M.L., Lapinski, R.H. et al. (1990) Delayed childbearing and the outcome of pregnancy. New Eng. J. Med., 322, 659-664.
5) Kiely, J.L., Paneth, N. and Susser, M. (1986) An assessment of the effects of maternal age and parity in different components of perinatal mortality. Am. J. Epidemiol., 123, 444-454.
6) Stein, A. (1983) Pregnancy in gravidas over age 35 years. J. NursMidwif., 28, 17-20.
7) Hassold T, Chiu D. (1985)Maternal age-specific rates of numerical chromosome abnormalities with special reference to trisomy. Hum Genet ;70:11-7.
8) Kolevzon A, Gross R, Reichenberg A. (2007) Prenatal and perinatal risk factors for autism: a review and integration of findings. Arch PediatrAdolesc Med 161:326-33.
9) Wennerholm UB, Bergh C, Hamberger L. Lundin K, Nilsson L, Wikland M, et al. (2000) Incidence of congenital malformations in children born after ICSI. HumReprod. 15:944-8.
10) Hollier LM, Leveno KJ, Kelly MA, MCIntirc DD. (2000) Maternal age and malformations in singleton birth. Obstet. Gynecol. 96(5 pt 1):701-6.
11) Joseph KS, Allen AC, Dodds L, Turner LA, Scott H, Liston R. (2005) The perinatal effects of delayed childbearing. Obstet. Gynecol. 105:1410-8.
12) Stein Z, Susser M. (2000)The risks of having children later in life: Social Advantage may make up for biologic disadvantage. BMJ 320;1681-2.
13) Ziadeh S, Yahaya A. (2001) Pregnancy outcome at age 40 and older. Arch GynecolObsetet 265 30-3.
14) Hoffman MC, Jeffers S, Carer J, Duthely L, Cotter A, et al. (2007) Pregnancy at or beyond age 40 years is associated with an increased risk of fetal death and other adverse outcomes. Am J ObstetGynecol 196: e11-13. [PubMed]
15) Jahromi BN, Husseini Z. (2008) Pregnancy outcome at maternal age 40 and older. Taiwan J ObstetGynecol 47:318-21.
16) Jolly M, Sebire. N, Harris J, Robinson S. and Regan L.(2000) The risks associated with pregnancy in women aged 35 years or older. 15:2433-2437.
17) Louise C. Kenny, Tina Lavender, Roseanne McNamee, Sinead M. O'Neill, Tracey Mills, and Ali S. Khashan. (2003) Advanced maternal age and adverse pregnancy outcome.
18) Yangmei Li, John Townend, Rachel Rowe, Marian knight, Peter Brocklehurst, and Jennifer Hollowell. (2013)The effect of maternal age and planned place of birth on intrapartum outcomes in healthy women with straight forward pregnancies.