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PPH among Teenage pregnancy in Mosul city Iraq what are the incidence and Causes?

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ABSTRACT

Teenage pregnancy considered a high risk factor for women in reproductive age. There is a sharp rise in teenage child bearing in Mosul city, especially after war crises. PPH is potentially a life threatening preventable condition that persist the leading cause of maternal death. The aim of this study is to measure the incidence and find the causes of PPH in teenage pregnancies, and to formulate the recommendations for reducing teenage maternal mortality & morbidity. This is a prospective cross-sectional study. A236 Adolescent pregnant cases from AL-Batool and AL-khansaa teaching hospitals in Mosul city recruited during the period from 1st of Nov. 2018 to the end of April 2019. The demographic and obstetric data gathered using a predesigned questionnaire. The result showed that the Pregnancyin adolescence is both a medical & public health concern, which may negatively impact the physical and social development of mother and affect the reproductive quality in given society. The incidence of primary PPH in teenage pregnancy in our study was 17.8%. Secondary PPH is zero. The main causes of teenage PPH in our study were: anemia 60%, PET 14%, perineal tear 12%, prolonged labour 10%, Retained placenta 2%, uterine inversion 2%. Teenage pregnancy in Iraq as in other countries is not merely a health problem but a socio economic problem, linked with adverse socio economic condition and poverty.

Keywords: Teenage pregnancy, postpartum hemorrhage, socioeconomic problem, poverty.

INTRODUCTION

WHO[7]defines teenage pregnancy as "any pregnancy from a girl who is (10-19) years of age". The age being defined as her age at the time of the baby born[8].Teenage pregnancy has traditionally been considered high risk pregnancy, especially in developing countries. According to WHO data, about half of the worlds population is under 25y. old, and 88% live in developing world[1].These immature patients are physically and mentally not optimally prepared to undertake parenting, lack of education, poverty, poor nutritional status, contribute to poor obstetric outcome[5]. Among the girls of less of 15 years, the risk is multiplied by five[4]. The Iraq war led to sharp rise in teenage child bearing, according to research published by the London school of economics and political science, 12Dec. 2014.**:**During the war, women who would have married later in life instead married at much younger age, manygirls may have been induced to marry early by a lack of alternatives, and families may have considered early marriage the best way to protect their daughters and family honour[6].The married teenage have lower status in the home and may be at higher risk of domestic violence, these negative effects may be magnified by the fact that early marriage occur mainly among girls with no education or only primary schooling[6]. PPH is the leading cause of maternal mortality[9]. All women who carry a pregnancy beyond 20 weeks gestation are at risk of PPH[10]. Millions of women survive after PPH and continue to suffer from it is debilitating consequences , including chronic illness, disability , an increase risk of death and poor growth and development of their children.[9]

Classifications of PPH:
Conventional temporal classification:

Hemorrhage within the first 24 hours of delivery is termed primary PPH, where as bleeding occurring after wards, but within 12 weeks of delivery termed secondary PPH [11]. In both cases,the true blood loss is often under estimated due to thedifficulty with visual quantitation. [12][13]

Classification based according to causative factors :[14]

The causes of PPH can also form a basis of classification.

Causes of primary PPH (4T): Tonus (uterine atony). Tissue. Trauma. Thrombin.

Causes of secondary PPH: Uterine infection. Retained placental fragments. Abnormal involution of placental site.

Proposed classification:

The 500ml limit as defined by WHO{15} should be considered as an alert line; the action line is their reached when vital functions of the women are endangered. In healthy women this usually occur after the blood loss has exceed (1000)ml. Adaptation of a previously described classification{16} will fulfill most of these criteria. This guideline adopts a practicalapproach whereby a perceived loss of 500-1000ml (in the absence of clinical signs of shock) alert line, where as a perceived loss of more than 1000ml or a smaller loss associated with clinical signs of shock (hypotension, tachycardia, tachypnea, oliguria or delayed peripheral capillary filling) prompts a full protocol of measures to resuscitate monitor and arrest bleeding (action line).[17]

Anemia in pregnancy is defined as hemoglobin level below 11 g/dl (WHO){18}. It has long been considered that anemia increases the risk of PPH {19}. Small studies demonstrated causal – relationship between severe anemia and uterine atony which is the main causes of PPH accounting for about 90% in most studies{20}. Sever anemia may weaken uterine muscular strength or lower resistance to infectious diseases, contributing to PPH and subsequent maternal mortality {21}{22}. Prior studies have demonstrated that sever anemia may impair myometrium contractility resulting from impaired transport of hemoglobin and oxygen to uterus causing tissue enzyme and cellular dysfunction{23}{24}. Teenage girls enter pregnancy with less than adequate stores of nutrients and are thus unable to withstand the demands imposed by pregnancy (sergeant and schulken, 1994){25}. It is also suggested that there could be competition for nutrients between the young growing mother and the fetus (schollet at 1994){26}. Another cause of PPH which is the major contributor to maternal death and morbidity is pre-eclampsia (PET), complicating 2-8% of pregnancies world wide and 2-5 % in high resource countries.{27,28,29}.

This is conceivable considering it's multifactorial pathogenesis, where angiogenic factors, endothelial dysfunction and impaired utero-placental blood flow result in hypertension coagulation abnormalities.{30} During adolescence, four putative drivers of PET can be identified:1st: uterine immaturity in very young teenage is likely a major cause of defective deep placentation and adverse reproductive outcome. 2nd: the association between adolescent obesity and PET merits further studies on the benefit of weight loss and dietary interventions to improve pregnancy outcome. 3rd: there is a need for greater awareness of the link between cardio vascular risk factors in young women and early onset PET associated with atherosclerosis of the utero-placental arteries. Finally: infrequent menstruation may prolong uterine immaturity because of lack of menstrual preconditioning {31}. A prolong labour is another cause of PPH. The WHO defines a prolonged active phase as regular painful contractions for more than 12hrs after cervical dilatation of ≥ 4cm{32}. Stones et al {33} reported an increased risk of sever PPH if the labour lasted more than 12 hours. Uterine a tony occurs when the relaxed myometrium fail to constrict the uterine blood vessels. Regular contractions over several hours of labour will exhaust the uterine muscles and thereby reduce their contractility over time, causing uterine dysfunction. Abnormally prolonged or obstructed labour and PPH are common in the age before 20y{34}. Teenage mothers are physically underdeveloped, Parents consider their girls mature at menarche but young woman's pelvis still takes more time to grow, therefore pregnancy and birth at a young age results in serious risks for both mothers and child{34}.

It was observed however that adolescents required significantly twice more episiotomies than the adult, thus is acommon finding in literature{35-36}, pelvic and perineal immaturity can well explain this higher rate of episiotomies in adolescent parturient{37}. ANC it is an important part of obstetric & perinatal care. It is often considered one of the best examples of preventive medicine, and essential for the attainment of an optimal outcome of pregnancy (Adolescent pregnancy WHO Geneva 2004 sec 8.1). It can easily be understood that better ANC may result in less sever hypertensive disease (Adolescent pregnancy WHO Geneva 2004 sec 8.3). Another problem is anemia, detection of anemia during routine ANC is once again easy if the pregnant women does not book in too late (Adolescent pregnancy WHO Geneva 2004 sec 8.6). One criteria is However specific to ANC in adolescent namely the determination of gynecological age. The caregiver should ask for the age at which menarche occurred. If the gynecological age is less than 2years, the girls is at increased risk of preterm labour, & in some regions obstructed labour (Adolescent pregnancy WHO Geneva 2004 sec 5.2){38}. WHO has developed acolor scale for the estimate of hemoglobin in developing countries and advices the provision of iron and folate supplements to all pregnant women. (Adolescent pregnancy WHO Geneva 2004 sec 8.6). Nutritional advice & supplementation are often emphasized as tools to improve the outcome of adolescent pregnancy. Advice to promote healthy nutrition is part of good ANC for all pregnant women (Adolescent pregnancy WHO Geneva 2004 sec 8.6).{38}

AIM OF THE STUDY

To measure the incidence and find the causes of PPH in teenage pregnancies,and to formulate the recommendations for reducing teenage maternal mortality & morbidity.

PATIENTS AND METHODS

Study design

A prospective cross sectional study

Study Population

A 236 adolescent pregnant cases from AL-BATOOL and AL-KHANSAA teaching hospitals in Mosul city, recruited during the period from 1st of Nov. 2018 to the end of April 2019. The inclusion criteria were teenage deliveries 19y. old or less, singleton pregnancies, normal or cesarean deliveries, were enrolled in this study. Patients with blood diseases, obesity, and multiple pregnancy were excluded for analysis. The amount of blood loss was estimated by standardized visual estimation and checking clinical condition of patients. Good ANCdefined as patients have more than 5 visits, Medium ANC between (3-5) visits. Unbooked (Bad) ANC those who seeking medical advice only during labour. Socioeconomic status was broken into 3 levels (high, middle and low), its commonly conceptualized as a combination of economic, social, and work status, measured by income, education & occupation respectively.

RESULTS

The total no. of cases are 236. The no. of primary PPH are 42cases, the no. of secondary PPH is zero with incidence 17.8% and 0% respectively. The no. of patients delivered without PPH are 194 with percent 82.2% as shown in table (1).

The predominant age was 18 and 19 years which account 35.9% and 31.6% respectively, followed by 17y. old 23.5%, 16y. old 5.6%,15y. old 3% and 14y.old 0.4%,as shown in table (2).

Place of delivery is at hospital in 99.1% and midwife delivery 0.9%, as shown in table (3).

Education status is taken in consideration and described6-12years schooling 55.8% as higher rate, followed by illiterate 32.8%,12-15y schooling 9.2%, and over than 15y. schooling 2.2%, as shown in table (4).

Socioeconomic status is considered also with middle class 56.3% followed by low class (poor) 40.3%, and high class in 3.4% only, as shown in table (5) .

Address of patients, urban area is taken 56.9% and rural area 43.1%, as shown in table (6).

Antenatal care is highly significant, patients with minimal ANC 40.6%, followed by medium 26.3%, unbooked 25.4%, and good ANC 7.7%, as shown in table (7).

Condition on arrival is also highly significant with stable patients 99.4%, and shock patients 0.6%, as shown in table (8).

Concerning parity,P1 (1ST pregnancy) with PPH was reported in78.6% followed byP2 (2nd pregnancy) 21.4%,P3(3rd pregnancy)0.0%,as shown in table (9).

In relation with chronic disease and pregnancy complications, hyperemesis report higher incidence 44.3%, followed by anemia 42.7%, PET 8%,threatened abortion 3.2%, APL syndrome 0.8%,and APH, fetal anomaly o.5% as shown in table (10).

Mode of delivery are normal 87.6%, cesarean section 11.9%, and instrumental 0.5% , as shown in table (11).

Indications of cesarean sections are first stage of labour47%, malpresentation 23%, and the 2nd stage of labour , fetal distress and eclamptic fit are 10%, as shown in table (12).

Complications during labour are mostly uterine inertia 69.1%, sever PET &fit 14.3%, perineal and cervical tear 4.7%, midwife interference 4.7%, and the accidental hemorrhage, retained placenta & uterine inversion are 2.4%, as shown in table (13).

Patients reach near miss are 3, two ended with hysterectomy, DIC,&ICU admission, and one treated with intrauterine Bakrey Balloon and blood transfusion, as shown in table (14).According to Benedetti clinical classification of PPH patients with normal loss are (84%), patients with class1(4%), class2 (10%), class3 (1%), class4 (1%), as shown in table (15). According to causes of PPH the main cause is anemia 25%, followed by PET 6%, perineal tear 5%, prolong labour 4%, retained placenta & uterine inversion are1%, as shown in table (16).

Table 1: Incidence of PPH

Cases	No.	%	Chi Square Test	P- Value
Non PPH	194	82.2	13.851	0.032*
Primary PPH	42	17.8		
Secondary PPH	0	0		

* P < 0.05 (Normal Sig.).

Table 2: Age of patients

Age	%	Chi Square Test	P- Value
14.00	0.4	233.564	0.000**
15.00	3.0		
16.00	5.6		
17.00	23.5		
18.00	35.9		
19.00	31.6		

** P < 0.01 (Highly Sig.).

Table 3: Place of Delivery

Place of Delivery	%	Chi Square Test	P- Value
Hospital	99.1	225.069	0.000**
Mid Wife	0.9		

** P < 0.01 (Highly Sig.).

Table 4: Education Status

Education Status	%	Chi Square Test	P- Value
< 6 y. Schooling (Illiterate)	32.8	163.576	0.000**
6-12 y. Schooling	55.8		
12-15 y. Schooling	9.2		
> 15 y. Schooling	2.2		

** P < 0.01 (Highly Sig.).

Table 5: Socioeconomic Status

Socioeconomic Status	%	Chi Square Test	P- Value
Low class (Poor)	40.3	101.636	0.000**
Middle Class	56.3		
High Class	3.4		

** P < 0.01 (Highly Sig.).

Table 6: Address of patients

Address	%	Chi Square Test	P- Value
Rural area	43.1	4.414	0.036*
Urban area	56.9		

* P < 0.05 (Normal Sig.).

Table 7: Ante Natal Care

Ante Natal Care	%	Chi Square Test	P- Value
Un booked (Bad)	25.4	45.833	0.000**
Minimal	40.6		
Medium	26.3		
Good	7.7		

** P < 0.01 (Highly Sig.).

Table 8: Condition on Arrival

Condition on Arrival	%	Chi Square Test	P- Value
Stable	99.4	345.150	0.000**
Shock	0.6		

** P < 0.01 (Highly Sig.).

Table 9: No. of Parity

Parity	No PPH		PPH		Chi Square Test	P- Value
	No.	**%**	**No.**	**%**		
P1	**148**	**76.3**	**33**	**78.6**	**16.00**	**0.029***
P2	**43**	**22.2**	**9**	**21.4**		
P3	**3**	**1.5**	**0**	**0.0**		
Total	**194**	**100**	**42**	**100**		

* P < 0.05 (Normal Sig.).

No. of parity with PPH

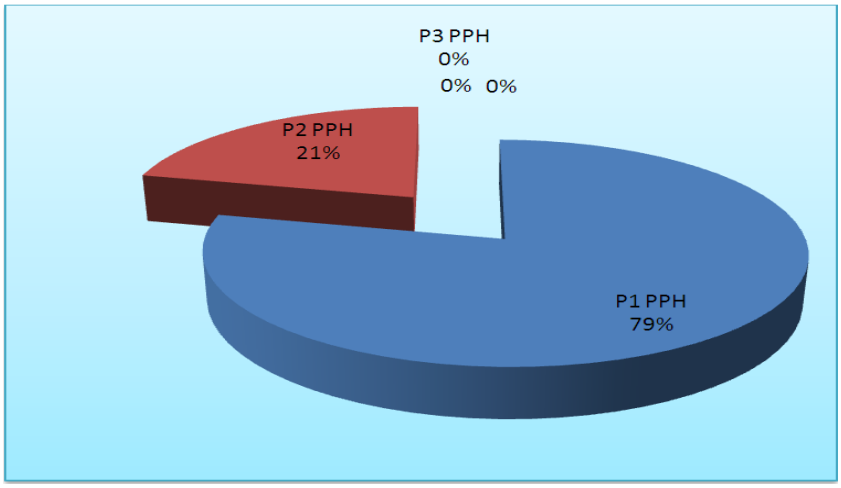


Table 10: Chronic Diseases & Pregnancy Complications

Chronic Diseases & Pregnancy Complications	%	Chi Square Test	P- Value
Anemia	42.7	493.8	0.000**
Hyper Emesis	44.3		
Threatened Abortion	3.2		
Ante Partum Hemorrhage	0.5		
Fetal Anomaly	0.5		
PET	8.0		
APL	0.8		

** P < 0.01 (Highly Sig.).

Chronic Diseases & Pregnancy Complications

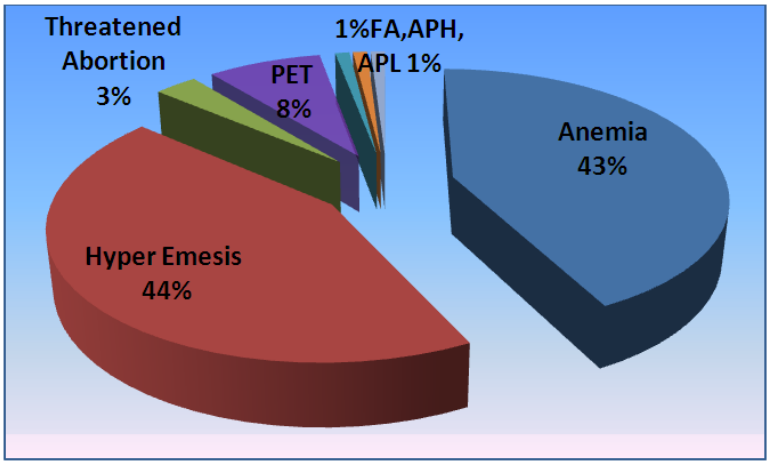


Table 11: Mode of Delivery

Mode ofDelivery	%	Chi Square Test	P- Value
Normal	87.6	306.009	0.000**
Instrumental (Vacuum)	0.5		
Cesarean Section	11.9		

** P < 0.01 (Highly Sig.).

Table 12: Indication of Cesarean Section

Indication of Cesarean Section	%	Chi Square Test	P- Value
First Stage Failure	**47**	**18.629**	**0.001****
Second Stage Failure	**10**		
Fetal Distress	**10**		
Eclamptic fit	**10**		
Mal Presentation	**23**		

** P < 0.01 (Highly Sig.).

Indication of Cesarean Section

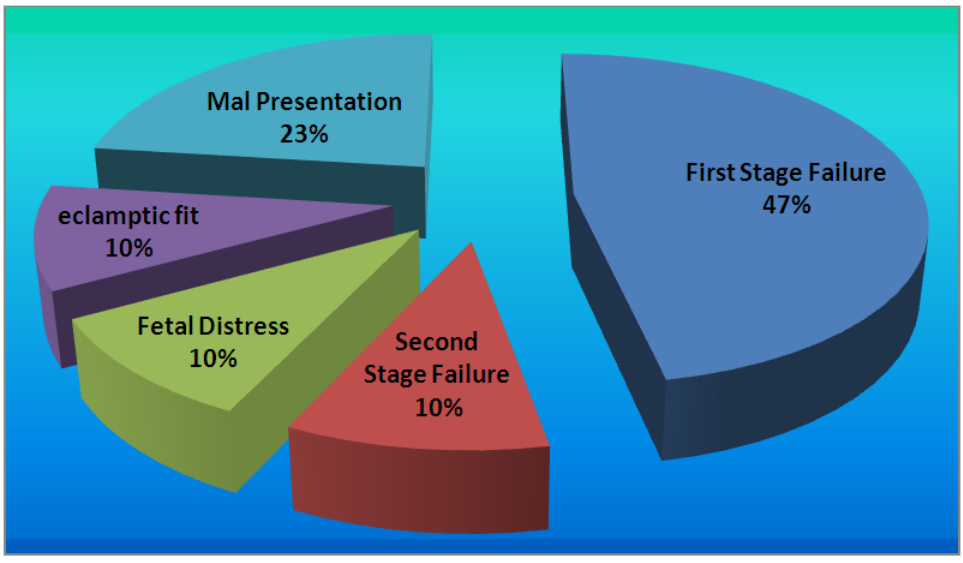


Table 13: Complications During Labour

Complications During Lab our	%	Chi Square Test	P- Value
Accidental Hemorrhage	**2.4**		
Uterine Inertia	**69.1**		
Retained Placenta	**2.4**		
sever PET&FIT	**14.3**	**15.71**	**0.0166***
Perineal&cervical tear	**4.7**		
midwife interference	**4.7**		
Uterine inversion	**2.4**		

* P < 0.05 (Sig.)

Complications During Labour

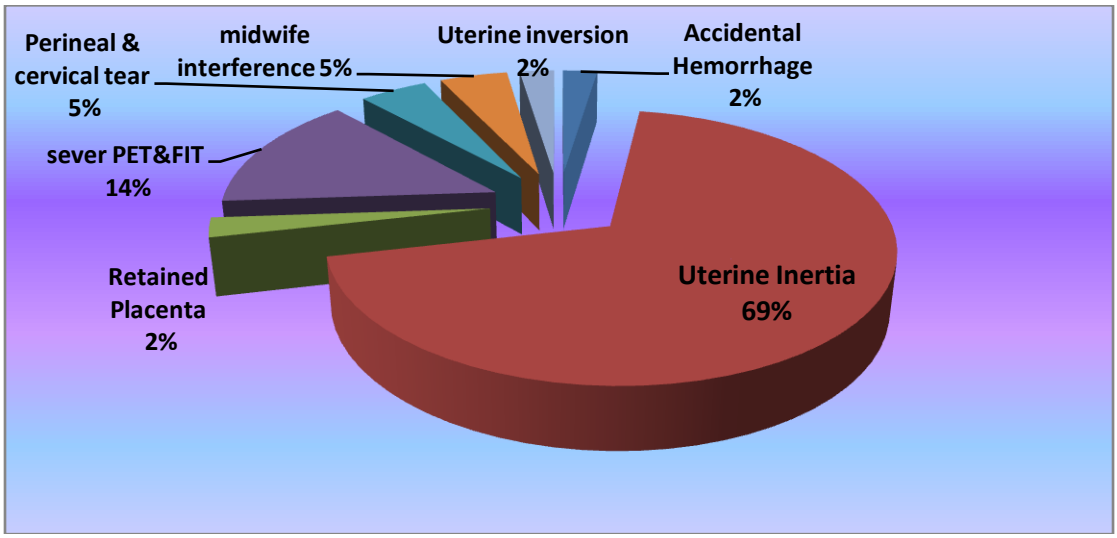
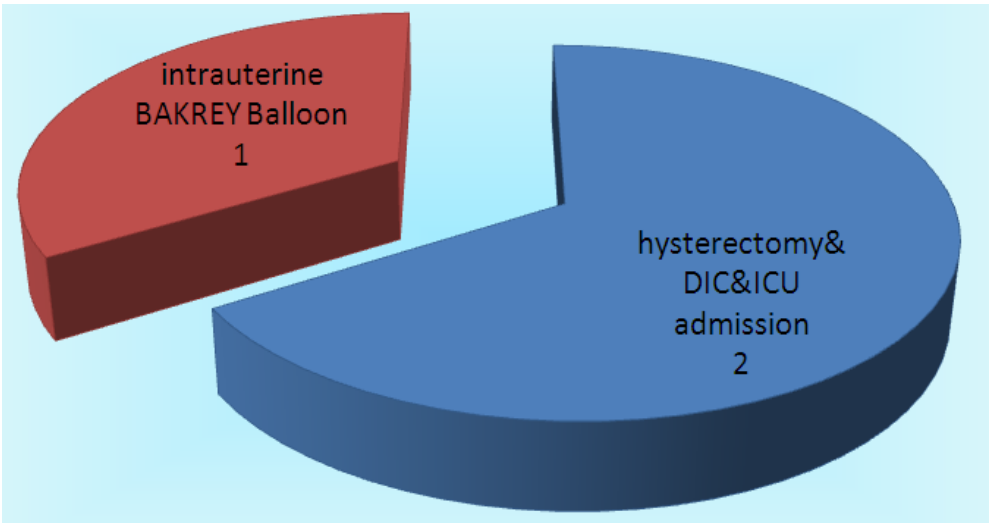


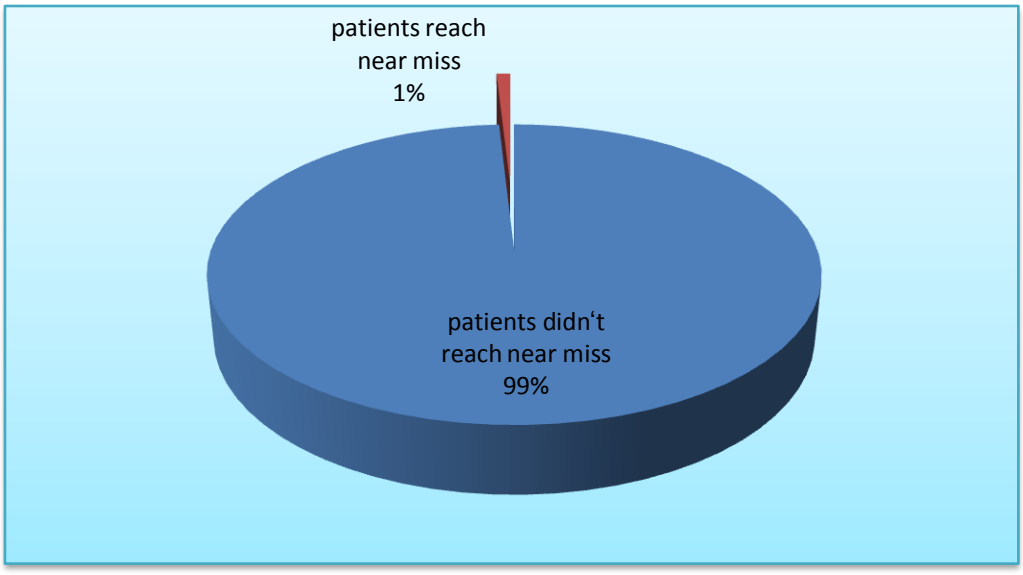
Table 14: Patients Reach Near Miss

Patient Reach Near Miss	No.	%	Chi Square Test	P- Value
Hysterectomy & DIC & ICU Admission	2	4.7	4.628	0.287
Intrauterine Bakrey Balloon	1	2.4		

Non Sig.

Patients Reach Near Miss





PPH Classifications:

Table 15: According to Benedetti the clinical classification of PPH

Hemorrhage Class	Estimated Blood Loss (ml)	n. of Patient	Blood Volume loss (%)	Clinical Signs and Symptoms
0 (Normal loss)	< 500 ml.	199	< 10	None
ALERT LINE				
1 class1	500-1000 ml.	9	15	Minimal
ACTION LINE				
2 class2	1200-1500 ml.	24	20-25	Urine Output Plus Rate Respiratory Rate Postural hypotension Narrow pulse pressure
3 class3	1800-2100 ml.	2	30-35	Hypotension tachycardia Cold clammy tachypnea
4 class4	> 2400 ml.	2	> 40	Profound

According to Benedetti the clinical classification of PPH

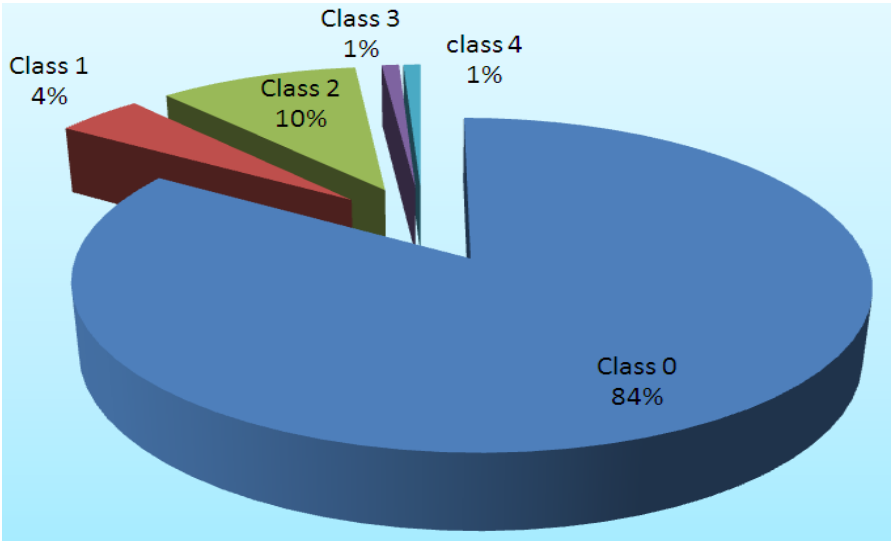
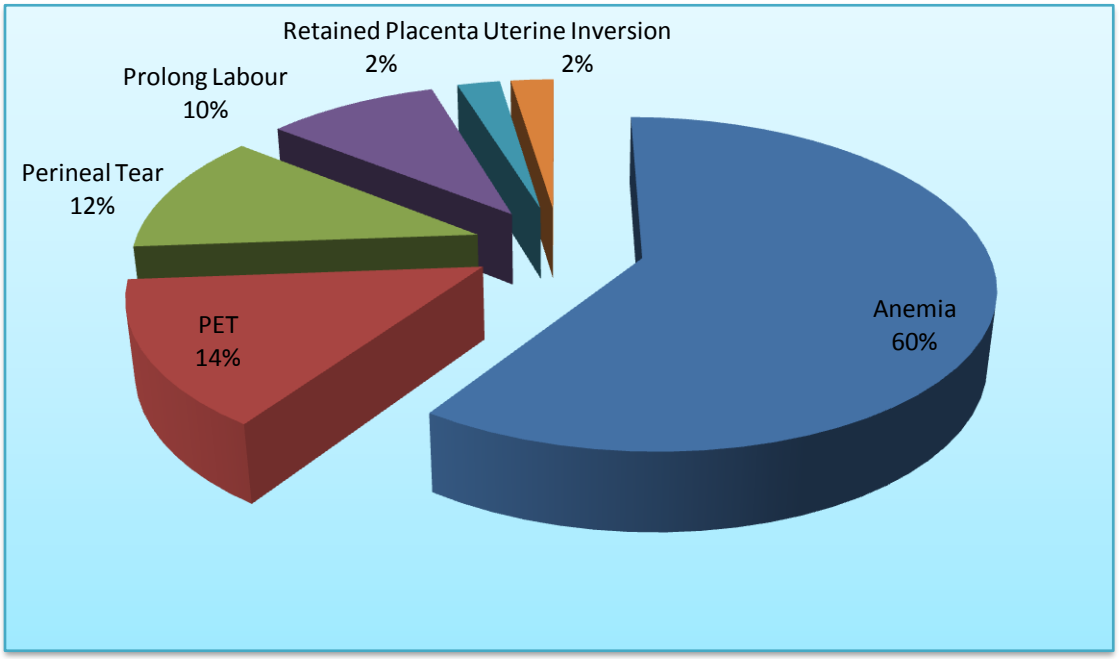


Table 16: The Causes of PPH

Cause	No.	%
Anemia	25	60%
PET	6	14%
Perineal Tear	5	12%
Prolong Labour	4	10%
Retained Placenta	1	2%
Uterine Inversion	1	2%
Total	42	100%

The Causes of PPH



DESCUSSION

There are no previous researches focus only on PPH in teenage pregnancy,as teenage pregnancy is considered a high risk pregnancy is increasing in our locality as aresult of poor socioeconomic status which increase after last events occur in Mosul city, we do this research to evaluate the incidence of a very important, fetal and preventable complication in obstetric which is the PPH. Teenage pregnancy emerged as a national,social implications,as usually teenage pregnancy occurred outside marriage,this didn't appear to be a problem in our society, as all teenage mothers in our study are married and received full social and emotional support. The main problems of teenage pregnancy in our society are poor socioeconomic status, malnutrition, low education, bad ANC, difficult arrival to hospitals from far areas, and bad health services, especially after war events which occurred in Mosul city before ashort period of this study and lead to destruction of roads, bridges, hospitals, and health centers.

Our study is in agreement with study was done in American University of Beirut on August 2015 By D. Jeha et al[39]. Who said: It appear that young maternal age may not have a direct association with PPH but there are many factors that affect the analysis. For example Bildircin et al.[40] concluded that PPH was more common in adults, however the adults they referred to consisted of a large of women from (20-47) years of age, while other authors consider adults usually from (20-29) years of age, while other authors consider adults usually from (20-24) years or (20-29) years, some even (20-34) years. Such inconsistencies make it in increasingly difficult to draw conclusions concerning adolescent mothers and PPH. So evidence

concerning PPH is not cohesive. Some studies [41,42,43] show no significant difference in risk of PPH in adolescent mothers compared with adults. For example Lacobelli et al[43] found no significant difference in the incidence of PPH between two groups of patients aged less than 18 years and other group of patients age of (18-29) years. Another study[44] showed a significant decrease and still other[45]noted an increase in PPH in teenage mothers. Al Samaraiet al[46] study showed that PPH was the most frequent delivery complications in teenage pregnancy [28.3%]. In our study the prevalence of primary PPH in teenage deliveries are (17.8%), secondary PPH is (zero), this may be due to our study was done in two main teaching hospitals in Mosul city and we exclude multiple pregnancy, blood disease and obese patients from our study. Regarding the causes of PPH in teenage pregnancy, in our study the main cause is anemia 60%, this result agreed with other studies [43,44] which reported that PPH was significantly associated with anemia in pregnancy.

The 2nd cause of PPH in our study is PET 19%. Anationwide cohort study in the Netherlands[47], reported that pre-eclampsia have a1. 53 fold increase risk for PPH.

The 3rd cause of PPHin our study is perineal tear account 12%.It was observed that adolescents required significantly twice more episiotomies than the adults [35,36].

Prolong labour and CPD in our study represent 10% of PPH, this due to immaturity of pelvic bones and birth canal, (ZABIN et al 1998) said that immaturity of pelvic bone and birth canal in adolescents has been linked to increased risk of prolong and obstructed labour, episiotomy and use of forceps.

The prevalence of PPH due to retained placenta anduterine inversion in our study are 2%. In our study there are three cases reached near miss with ICU admission:1st case was 19 years old, illiterate, low socioeconomic state, un booked, p2, from rural area, present to hospital in shock state due to uterine inversion after midwife vaginal delivery at home, initial resuscitation was made, manual replacement of inverted uterus under GA was done, sever PPH didn't respond to medical and uterine sparing surgical trials, hence a decision of subtotal hysterectomy was done to safe life of mother. 2nd case also 19 years old patient, illiterate, low socio economic state, unbooked, p2, from rural area, present to hospital in shock state, sever PPH after midwife vaginal delivery at home, after initial resuscitation, laparotomy was done, a huge broad ligament hematoma, with extended cervical tear was found, uterus sparing surgery tried but failed to control bleeding, hence a decision of subtotal hysterectomy was done to safe life of mother. So adolescent pregnancy is a high risk pregnancy and they should deliver in hospital. 3rd case was primigravida from rural area with minimal ANC, present to hospital with anemia, sever PET, delivered normally in hospital, active management of 3rd stage of labour was done, but uterine inertia with sever PPH developed, managed with uterotonic drugs, blood transfusion and intrauterine BAKREY Balloon insertion, PPH stopped. So we should pay attention to regular ANC visits in order to treat anemia and PET especially in adolescents. There are other factors that play a role in the vicious circle of teenage pregnancy like: Low level of education, in our study alow level of education (6-12) year schooling form more than half of cases 55.8%, while illiterate (below 6y. schooling) form 32.8%, which is a high percentage, and form a stigma especially in country like Iraq which is over the centuries has been home to many ancient civilizations. While (12-15) year schooling and high level (more than 15) year schooling form 9.2%, 2.2% respectively.

Antenatal care is an important part of preventive medicine, a low level of perinatal visits, late initiation of prenatal care, inappropriate prenatal care play arole as a risk factor for PPH in teenage pregnancy, in our study 25.4% of patients wereun booked,40.6% with minimal ANC (less than 3 visits in whole pregnancy), 26.3%moderate ANC(3-5) visits, and only7.7% with good ANC (more than 5 visits to health centers during pregnancy).

Poverty and adverse socioeconomic conditions lead to early marriage, and teenage pregnancy, our research is in agreement with (Shaima et al)[48], that adolescent pregnancy in Iraq as in other countries not merely a health problem but a socioeconomic problem, linked with adverse socioeconomic condition and poverty especially in a country in a post war state and crises. It should be put as a priority if we are intending to interrupt the vicious circle related to all the above mentioned factors. In our study a low class (poor) patients form 46.3% of cases, a middle class form 56.3%, and a high class 3.4% only.

CONCLUSION

Teenage pregnancy in Mosul city is increasing in last few years, due to low education and high poverty. Education is the key to disrupting teenage pregnancy. Poverty and adverse socioeconomic state lead to early marriage and teenage pregnancy. Anemia is the main risk factor of PPH in teenage pregnancy due to malnutrition and poverty.

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