

Incidence And Associated Factors Of Anemia After Cesarean Delivery At St. Paul'S Hospital Millenium Medical College , Addis Ababa , Ethiopia : Retrospective Cross-Sectional study

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Abstract

Background: Anemia is the most common puerperal complication which increase the risk of maternal morbidity in postpartum period.

Cesarean section is a major surgical procedure in obstetrics worldwide. It saves the life of the mother as well as the fetus by use of advanced technique, use of antibiotics and blood transfusion. However, its complications during and after cesarean section pose higher maternal morbidity and mortality compared to other modes of deliveries in many developed and developing countries.

Objectives: The objective of this study is to assess the incidence and associated factors of anemia after cesarean delivery in St. Paul's Hospital Millennium Medical College, Addis Ababa – Ethiopia.

Methods: Institution based retrospective cross-sectional study was conducted from 275 mothers admitted for cesarean delivery from March 1, to August 30, 2019 G.C . at Saint Paul's Hospital Millennium Medical College .

Results: The incidence of anemia after caesarean section was 29.09%. According to this finding, factors significantly associated with Anemia were multiple gestation (AOR: 5.40, 95% CI: 1.71, 15.93), administration of general anesthesia during procedure (AOR: 3.88, 95% CI: 1.72, 8.78), emergency caesarean section (AOR: 4.72, 95% CI: 1.52, 14.67) and late term gestational age (AOR: 2.95, 95% CI: 1.37, 6.32)

Conclusions: Incidence of anemia after cesarean section at *St. Paul's Hospital Millennium Medical College* is too high. Most of these factors are manageable by early detection and prevention of obstetric complications and staffing health facilities by trained health care providers

Key Words: Anemia, caesarean section, associated factors

INTRODUCTION

Background

Globally 830 maternal deaths occur per day, and 216 deaths / 100,000 live births . Almost one third of these deaths are resulting from hemorrhage during pregnancy and delivery.(1)

Most clinicians diagnose anemia when the hemoglobin concentration is less than 11 g/dL or the hematocrit is less than 33%. Using these criteria, 50% of pregnant women are anemic. The incidence of anemia changes depending on the population studied. It is unfortunate that this problem is often ignored; in developing nations, iron deficiency is an overwhelming problem, and worldwide, many maternal deaths occur because of excessive blood loss in those who were already anemic. Approximately 75% of anemia that occurs during pregnancy is secondary to iron deficiency and post partum anemia is usually secondary to blood loss during delivery.

Statement of the problem

Anemia is one of the common medical complication during pregnancy and post partum . Globally one third of all causes maternal mortality is from hemorrhage and its associated sequele.

In national study in our country hemorrhage causes 43 % of direct maternal mortality and anemia causes 13% of indirect causes of maternal mortality .(National Maternal Death Surveillance and Response (MDSR) Annual Report, 2009 EFY)

Cesarean delivery is the most common operation done in the world today. Cesarean delivery related maternal mortality and morbidity is decreasing due to improvement in experience in anesthesia , availability of antibiotics and blood transfusion services.

The average-sized woman with a hematocrit of 30 percent or more and with a normally expanded blood and extracellular fluid volume most often will tolerate blood loss up to 2000 mL without difficulty. Unappreciated bleeding through the vagina during the procedure, bleeding concealed in the uterus after its closure, or both commonly lead to underestimation.

Physiologically, towards the end of pregnancy, the uterus is perfused at a rate of 500-750ml/min, this massive hyper-perfusion results in an average blood loss of approximately 1000ml during C/S. The hematocrit is routinely measured the morning after surgery. It is checked sooner if there was unusual blood loss or if there is hypotension, tachycardia, oliguria, or other evidence to suggest hypovolemia.

More than two third of all maternal mortality occur in developing countries where EMOC facilities are inadequate due to multiple factors like lack of financial and trained human power.

Cesarean delivery is associated with increased blood loss related to delivery when compared to vaginal delivery. Cesarean delivery related blood loss may be excessive in some patients with previous cesarean scar due to increased risk of placenta previa and morbid adherence of placenta in repeated scars.

Significance of the Study

As seen from different literatures above anemia associated with cesarean delivery is associated with different obstetric and non-obstetric factors in developed and developing countries but, little is known in our hospital on incidence of anemia after cesarean delivery and specific obstetric factors. Since our Hospital is serving as tertiary center where patients with different obstetric factors are being treated. So far there is no study done in Saint Paul's Hospital on anemia post cesarean delivery. The aim of this study is to have data on incidence of anemia post cesarean delivery which may help as baseline for future research.

The result obtained from this study may help as a base for future research on this topic and help to improve quality cesarean delivery practice on minimizing blood loss during the procedure to reduce maternal morbidity in this Hospital and generalization can be done to other tertiary Hospitals.

It is believed that the provision of such information on this very important issue to this big institution would alert researchers, health care providers, community and other concerned bodies to the problem. It will help to draw the attention for policy makers in developing new policy, local and national level NGO's and responsible parties of the study site to respond appropriately to WHO recommended standards of care.

In retrospective cohort study done on maternal complication after cesarean delivery in South Ethiopia shows 28.6% of mothers with intraoperative surgical complication, among which 10% of all complication being anemia from hemorrhage. Cesarean section done for mal-presentation, second stage cesarean and those done under general anesthesia are associated with maternal complications. 5.3% of women who underwent cesarean delivery were transfused with blood intra-operatively. (4)

In another study done on maternal complication during cesarean delivery at Yirgalem Hospital Ethiopia shows 30.1 % of overall maternal complication. Major intraoperative complication was hemorrhage (64.5%). General anesthesia and having no ANC was associated with maternal complication in this study. (5)

In one study done on blood loss estimation during cesarean delivery, previous cesarean delivery, breech presentation, placenta previa are associated with significant blood loss during cesarean delivery. (6) In one study in Nigeria on cesarean delivery related blood transfusion, 42.5% of cesarean delivery rate and 20.8 % of them transfused with blood. The most common indication for transfusion was second stage cesarean section.(7)

In one study in Nigeria on post cesarean delivery infection excessive intraoperative blood loss and post C/S anemia are associated with puerperal infection. In similar study in Hawassa-Ethiopia post-operative anemia is significantly associated with surgical site infection. In other study done in SPHMMC anemia complicates 3.7% of women who underwent cesarean delivery (9,10,11).

A research done on maternal outcome after postpartum hemorrhage at TASH- Ethiopia with prevalence of PPH being 1.4% and 47.5% of these women were transfused with 1-7 unit of blood.

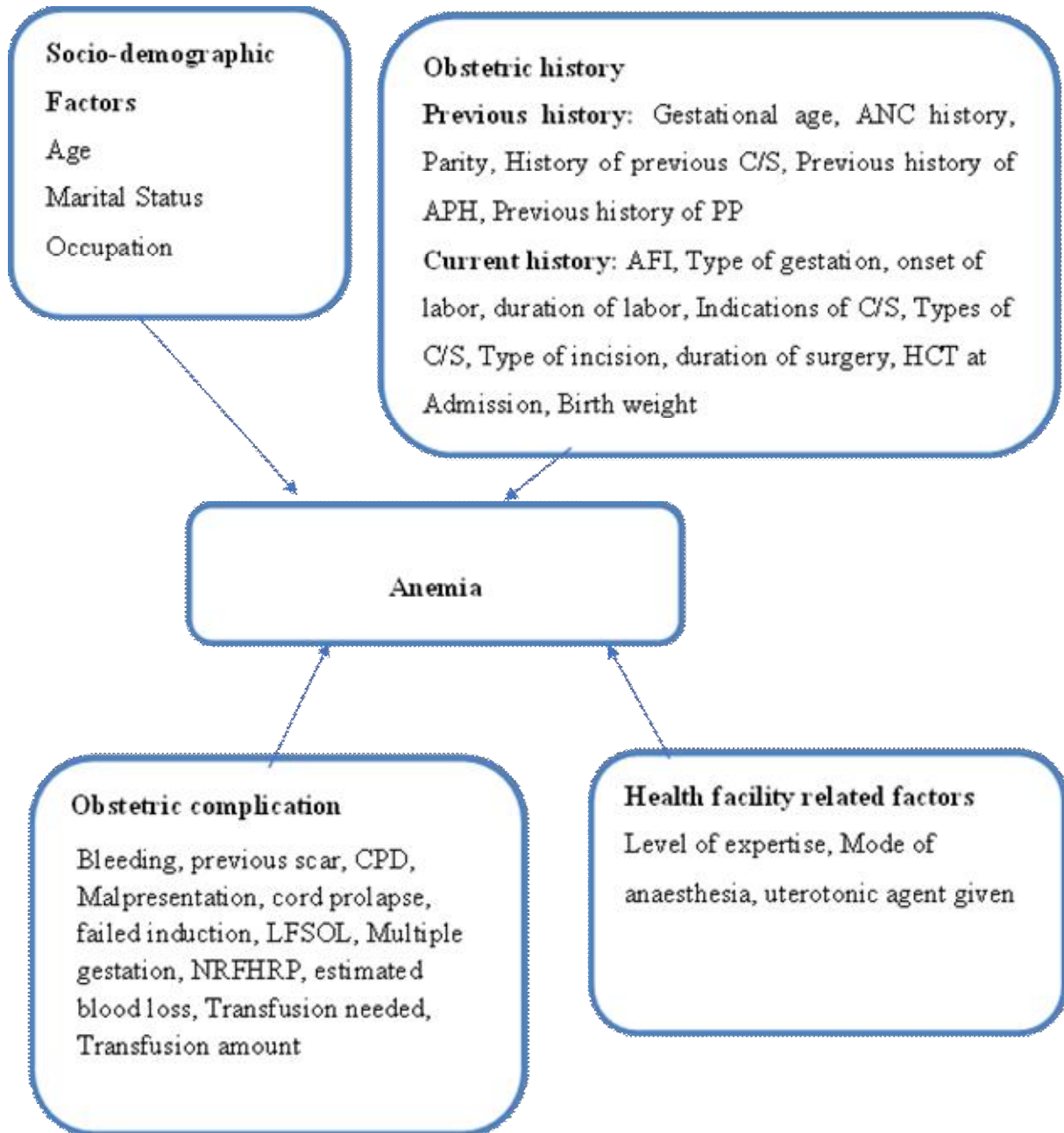
Study in California shows pre-delivery anemia was associated with severe post cesarean anemia with or without post-partum hemorrhage. Indian study shows post-partum hemorrhage was associated with macrosomia, grand multiparity, cesarean delivery, pre-delivery anemia and maternal age ≥ 40 yrs (16,17).

Study done on maternal complications of cesarean section in Cote d'Ivoire shows Placental abruption is also a provider of postoperative anemia. Hemorrhage risk factors during c-section are: uterine atony, prolonged labour, Placenta previa, chorioamnionitis, previous history of postpartum hemorrhage, general anesthesia and obesity .

A study done on maternal outcome of cesarean delivery at Attat Hospital revealed prevalence of cesarean delivery of 27.6% and most post-partum hemorrhage were treated medically and 1.4% of women who developed PPH were transfused with blood (20).

Since scarcity of data on incidence of anemia in this Hospital in particular and I want to know the magnitude of anemia and associated factors , so quality of care can be improved based on study result.

Conceptual framework of the study



OBJECTIVES

General Objective

The objective of this study is to determine the incidence and associated factors of Anemia after cesarean delivery in Saint Paul's Hospital Millennium Medical College .

Specific Objectives

- To assess incidence of anemia after cesarean delivery at St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia, 2019.
- To identify factors associated with anemia after cesarean delivery at St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia, 2019.

METHODOLOGY

Study period and Setting

This study was conducted at Saint Paul's Hospital Millennium Medical College which is found in Gullele -sub city, Addis Ababa, Ethiopia from March 1, to August 30 ,2019. Saint Paul's Hospital Millennium Medical College is one of the tertiary referral hospitals directly under the federal ministry of health. It is also a teaching hospital for the Millennium Medical College. The hospital gives service to 200,000 people annually who are referred from all corners of the country. On average 650 patients visit the hospital as outpatient and emergency daily. It gives service under different clinical disciplines which include obstetrics and gynecology. Nearly 4,634 attended antenatal care and around 10,000 deliveries were attended in 2008 Ethiopian fiscal year. Around 1,200 women receive abortion care in the hospital annually (Statistics office of the hospital).

It started obs/gyn residence since 2012 G.C to increase its contribution for the production of competent obstetricians and gynecologists.

Study Design

Institution based retrospective cross-sectional study design was conducted.

Source Population

All women who gave caesarean delivery at Saint Paul's Hospital Millennium and Medical College during study period

Study population:

Women who met inclusion criteria and selected from sample population was included during study period -since it was cross sectional study.

Eligibility Criteria

Inclusion criteria – woman who delivered by cesarean delivery (elective and emergency), with complete data for study , gestational age above 28 wk from date or early ultrasound.

Exclusion criteria- All women who does not met inclusion criteria and whose chart was incomplete excluded .

Sample Size and sampling Technique

Sample size determination

The sample size was calculated using formula for a single population proportion considering the following assumptions. Assumptions: A 95% confidence level, margin of error (0.05), From previous study done at SPH the incidence of cesarean delivery was 25% use $p=0.25$ (9)

$$n = \frac{Z^2 p(1-p)}{d^2} = 288$$

Where n = sample size

$P = 0.25$, $d = 0.05$

$Z = 1.96$ (standard normal probability for 95% CI).

Total number of cesarean deliveries done from March 1, to August 30, 2019 G.C was 2067 from Hospital report and since study population was 288 , sampling frame of 7 was used since $2067/288 = 7$. The first study unit was selected with lottery method and study unit was selected at interval of 7 from first unit.

Sampling technique

Systematic sampling technique was used to select 288 study participants from the women who delivered by caesarean at SPH. Data was collected from 275 women gave birth caesarean until required sample size reached and 13 study unit excluded due to incomplete data from chart. 95.5% of patient chart selected for the study was included with incomplete chart of 4.5%.

Variables

Dependent variable

Anemia

Independent variables

Socio-demographic Factors: Age, Marital Status, Occupation

Obstetric history: Gestational age, ANC history, Parity, History of previous C/S, Previous history of APH, Previous history of PP, AFI, Type of gestation, onset of labor, duration of

labor, Indications of C/S, Types of C/S, Type of incision, duration of surgery, HCT at Admission, Birth weight

Obstetric complication: Bleeding, previous scar, CPD, Malpresentation, cord prolapse, failed induction, LFSOL, Multiple gestation, NRFHRP, estimated blood loss, Transfusion needed, Transfusion amount

Intra operative factors: Mode of anesthesia, uterotonic agent given

Instruments

Data was collected using data extraction format prepared in English language, which was adapted from different literatures done on similar and related titles of the study.

Data collection procedures

A data extraction format with closed ended question was used to collect data from chart review by two trained midwives manually

Data quality control

To ensure quality of data pre-test was done on the study population . In addition, the collected data was checked for completeness, accuracy, and consistency before accepting from the data collectors.

Data processing and analysis

Data was checked for completeness and entered into Epi-Data version and exported to SPSS Version 25 for analysis. Descriptive statistics such as Percentage, standard deviation, frequency and mean were calculated. Binary logistic regression analysis was done and all independent variables, which had association with the dependent variable at p-values of less than 0.25, were considered for adjustment in the multivariable logistic regression. Multivariable logistic regression was done using backward method to identify factors associated with anemia at P value < 0.05 were considered as statistically significant association with dependent variable. The results were reported as Odds Ratio (OR) with respective 95% confidence intervals.

Ethical considerations

Ethical clearance obtained from Institution review board of Saint Paul's Hospital Millennium Medical College. Permission letter sought from hospital management body. confidentiality of the data also insured by omitting name of patients using data code.

In addition, the information sorted from kept strictly confidential.

Operational definitions

Anemia: HCT count < 33%

Postpartum hemorrhage- bleeding = >1000ml of blood loss with cesarean section, >1500ml blood loss during cesarean hysterectomy or $\geq 10\%$ hematocrit drop after delivery

Estimated blood loss- amount of blood estimated by treating physician which is documented on operation note.

Current APH- women having antepartum hemorrhage which occurs 24 hours before delivery

Incomplete chart- chart containing less than 75 % of required data for the study.

RESULTS

Socio demographic characteristics

The result showed that majority of respondent 155(56.4%) were between the age group of 25-34. The mean age of the respondent was 27.39 with SD of ± 4.99 . The majorities of participants were married and housewife 248 (90.2%) and 161 (58.5%) respectively.

Table 1: Distributions of caesarean delivery with their socio demographic characteristics at St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia, from March 1 to August 30,2019 G.C

Socio demographic variables		Count	Percent
Age category	<=24	85	30.9
	25-34	155	56.4
	>=35	38	12.7
Marital status	Married	248	90.2
	Divorced	22	8.0
	Widowed	5	1.8
Occupational status	House Wife	161	58.5
	Self Employed	40	14.5
	Government employee	54	19.6
	Merchant	20	7.3

Obstetric history

Almost all 273 (99.3%) of respondents had history of ANC visit. Amniotic fluid index profile of the study participants, 78.5% had normal followed by oligohydramnios 20.7%. Concerning type of gestation, 92% were singletons and 8% were twin pregnancy. The onset of labor was spontaneous for 158 (57.5%), elective C/S 74(26.9%) and the rest were by induction. Gestational Age (GA) of current pregnancy: most of them were full term 111(40.4%) followed by earl term 71 (25.8%), late term 53 (19.3%, early preterm 33(12%) and preterm 2.5%.

Except the delivering women with history of previous caesarean scar, high in number of the women 173 (86%) encountered the labor time ≤ 17 hours while others 14% were ≥ 18 hour.

The duration of surgery took more than 30 minutes for 200(72.7%) of the cases. The estimated blood loss was less than 1000 ml for 271 (98.5%) cases and more than 1000 ml for the other four cases. Regarding the birth weight of the current pregnancy, the majority 216 (78.5%) gave normal birth weight, 49 (17.8%) low birth weight and 10 (3.6%) were macrosomia (Table2)

Table 2: Distribution of caesarean delivery with their obstetric history at St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia, March 1 to August 30, 2019 G.C

Obstetric variables		Count	Percent
ANC visit	Yes	273	99.3
	No	2	0.7
Amniotic fluid index	Normal	216	78.5
	Oligohydramnios	57	20.7
	Polyhydramnios	2	0.7
Type of gestation	Singleton	253	92.0
	Twins	22	8.0
Onset of Labor	Spontaneous	158	57.5
	Induced	43	15.6
	Elective	74	26.9
Type of caesarean delivery	Elective	48	17.5
	Emergency	227	82.5
Type of uterine incision	LUSTCS	274	99.6
	Classical	1	0.4
Parity category	1-4	262	95.3
	≥ 5	13	4.7
Gestational age Category	Early preterm	33	12.0
	Late preterm	7	2.50
	Early term	71	25.8
	Full term	111	40.4
	Late term	53	19.3
Duration of labor	≤ 17 hour	173	86.1
	≥ 18 hour	28	13.9
EBL Category	< 1000 ml	271	98.5
	≥ 1000 ml	4	1.5
HCT at Admission	≥ 33	275	100.0

	<33	0	0.0
Birth weight Category	Normal birth weight	216	78.5
	Low birth weight	49	17.8
	Macrosomia	10	3.6

Past obstetric history

Fifty-seven (20.7%) of the participants had previous history of caesarean scar. Among them 39(68.4%), 16(28.1% & 3.5% had one, two and three previous scars respectively. In addition, 6 (2.2%) and 4(1.5%) of the study participants had history of placenta previa and abruption during current pregnancy respectively (Table 3)

Table 3: Distribution of women who gave birth by caesarean with their past obstetric history
St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia, March 1 to August 30,2019 G.C

		Count	Percent
History of previous C/S	yes	57	20.7
	no	218	79.3
Number of previous caesarean delivery	1 scar	39	68.4
	2 scars	16	28.1
	3 scars	2	3.5
Abruptio placenta	yes	4	1.5
	no	271	98.5
Placenta Previa	yes	6	2.2
	no	269	97.8

Current Obstetric complications

Among women who gave caesarean birth during this study period, 18 cases presented with obstetric complications. Those are Antepartum hemorrhage 11(61%) and intrapartum bleeding

7(39%). Among all cases, nine (3.3%) needed blood transfusion and 1 to 4 units of blood was transfused (Table 4)

Table 4: *Distributions of caesarean delivery with their current obstetric complication at St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia, March 1 to August 30, 2019 G.C*

		Count	Percent
Ante Partum	yes	11	4.0
Hemorrhage	no	264	96.0
Intraoperative	yes	7	2.5
complication occurred	no	268	97.5
Transfusion needed	yes	9	3.3
	no	266	96.7
Transfusion amount	1	3	33.3
(In Unit blood)	2	3	33.3
	3	2	22.2
	4	1	11.1

Hematocrit profile of the study participants

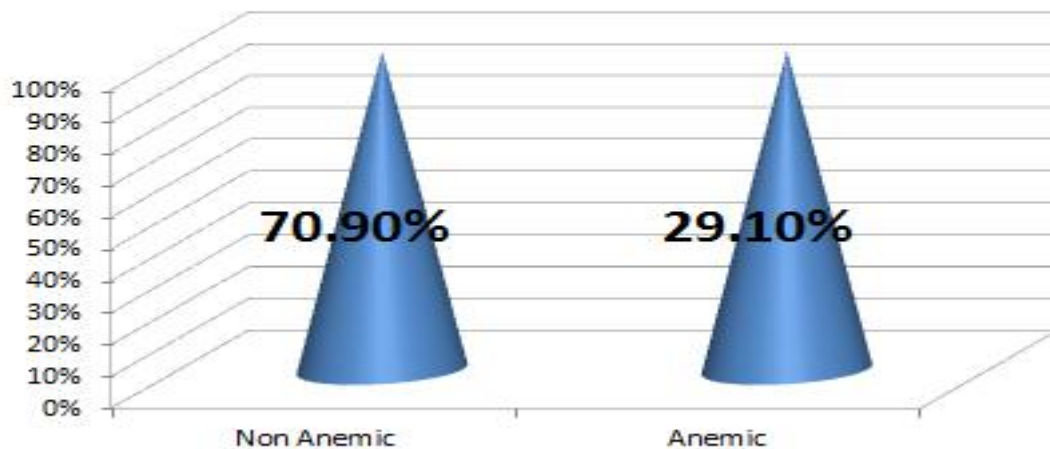
Hematocrit at admission (before caesarean section)

At admission to hospital, the hematocrit profile of all the participants was more than 33%. The mean hematocrit was 39.62 ± 7.94 with minimum of 34% and maximum of 48%.

Incidence of anemia after cesarean section

Among all caesarean deliveries, 80 women post caesarean hematocrit count became less than 33% giving the prevalence of Post caesarean section Anemia 29.1% at St. Paul's Hospital Millennium Medical College. There was high drop in hematocrit profile of women post caesarean delivery. The average post caesarean drop in hematocrit was 35.07 ± 14.24 with 19.70 % and 46.00% minimum and maximum count respectively.

Distribution of post cesarean anemia among women who delivered at St. Paul's Hospital from March 1 to August 30, 2019 G.C



Intra operative factors

Spinal anesthesia was given for the majority of the women during surgery 237(86.2%) whereas the rest 13.8% received general anesthesia. Level of expertise who conducted the surgery, majority 168(61.1%) done by year two Obstetrics and Gynecology specialty students (Resident 2) followed by Resident 1 (22.9%, R 3 (15.3%) and R4 0.7%. Uterotonic agents given for prevention of post partum hemorrhage are : oxytocin 243 (88.4%) followed by 29 (10.5%) who received both misoprostol + oxytocin.

Table 5: *Distributions of caesarean section with intra operative factors at St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia March 1 to August 30,2019 G.C.*

		Count	Percent
Mode of anesthesia	Spinal	237	86.2
	General	38	13.8
Uterotonic agent given	Oxytocin	243	88.4
	Misoprostol	3	1.1
	Misoprostol +	29	10.5
	Oxytocin		

Indications of Caesarean Section

The result showed that the most leading indication of caesarean section was NRFHRP 88(32%) followed by Previous scar, LFSOL+ MSAF, CPD, Malpresentation, Multiple gestation for CS, failed induction APH with Bleeding and cord prolapse which were 20.73%, 14.91%, 8.36%,6.18%,6.18%,5.45%, 4% and 2.18% respectively

Indication of cesarean delivery at St. Paul's Hospital Millennium Medical College from March 1 to August 30,2019 G.CAddis Ababa , Ethiopia

Indication of cesarean delivery	Number	Percent
NRFHRP	88	32
Previous C/S scar	57	20.73
LFSOL + thick meconium	41	14.91
CPD	23	8.36
Malpresentation	17	6.18
Multiple gestation	17	6.18
Failed induction	15	5.45
APH with bleeding	11	4
Cord prolapse	6	2.18

Binary regression Result

Factors associated to anemia among Independent variables on Binary Logistic Regression

Table 6: Simple logistic regression and corresponding p-values for the association between the post caesarean section Anemia with socio-demographic characteristics, Obstetric history, obstetric complications and health facility related factors at St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia 2019

Variables in the Model		Anemia		COR	95% C. I		P-Value
		Yes	No		Lower	Upper	
Previous history of C/S	Yes	11	46	.51	.36	2.71	0.071
	No	69	149	1			
Type of Gestation	Single	68	185				0.009**
	Twin	12	10	3.26	1.71	15.93	
Onset of labor	Spontaneous	55	103	1			.396
	Induced	12	31	.72	.396	2.235	
	Elective	13	61	.40	.26	2.04	
Type of C/S	Elective	4	44	1			0.002**
	Emergency	76	151	5.53	1.52	14.67	
Mode of Anaesthesia	Spinal	58	179	1			0.000**
	General	22	16	4.24	1.72	8.78	
Uterotonic agents given	Oxytocin	61	182	1			.148*
	Misoprostol	2	1	5.96	.41	152.96	
	Misoprostol & Oxytocin	17	12	4.23	1.12	7.18	
Parity category	1-4	74	188	1			0.006**
	≥5	6	7	2.18	.18	5.20	
Gestational Age	Full term	22	89	1			

Category	Early preterm	9	24	.83	.24	2.26	.363
	Early term	20	51	1.69	.35	1.76	.194*
	Preterm	4	3	4.44	.34	12.22	.035**
	Late term	25	28	12.46	1.37	6.32	.000**
Birth weight Category	Normal	61	155	1			
	low	14	35	1.02	.37	2.98	.963
	Macrosomia	5	5	2.54	.56	14.64	.152*
Current APH	Yes	5	6	.47	.41	9.21	0.232*
	No	75	189	1			

Note: *-shows variables are candidate for multivariable logistic regression ($p < 0.25$)

** -shows variables significantly associated with anemia ($p < 0.05$)

Multivariable Logistic Regression Results

Significantly Associated variables in Multivariable Logistic Regression

Multivariable Logistic regression analysis was done to identify the effect of independent variables on incidence of anemia.

The study showed that women with twin gestation were 5 times more likely to develop anemia post caesarean delivery (AOR: 5.40, 95% CI: 1.71, 15.93) than those with singleton gestation.

Women who administered general anesthesia during surgery were about 4 times more likely to become anemic post caesarean (AOR: 3.88, 95% CI: 1.72, 8.78) when compared with those given spinal anesthesia.

The study also revealed that women who undergone emergency caesarean section were nearly 5 times more likely to develop post caesarean anemia (AOR: 4.72, 95% CI: 1.52, 14.67) when compared with elective one.

Gestational age had a significant association with post caesarean anemia. Women in late term gestational (41-42 weeks) were 3 times more likely to develop anemia post caesarean period (AOR: 2.95, 95% CI: 1.37, 6.32) when compared with those in full (39-40) gestational age.

Table 7: Multiple logistic regression model with their corresponding p-values for the associations between the post caesarean anemia and independent predictor variables at St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia 2019.

Variables in the Model		Anemia		COR	AOR	95% C. I		P-Value
		Yes	No			Lower	Upper	
Previous C/S history	Yes	11	46	.52	.99	.36	2.72	.981
	No	69	149		1			
Type of Gestation	Single	68	185		1			
	Twin	12	10	3.26	5.22	1.71	15.934	.004
Onset of labor	Spontaneous	55	103		1			
	Induced	12	31	.72	.94	.39	2.235	.890
	Elective	13	61	.40	.73	.26	2.041	.549
Type of C/S	Elective	4	44		1			
	Emergency	76	151	5.53	4.72	1.52	14.672	.007
Mode of Anesthesia	Spinal	58	179		1			
	General	22	16	4.24	3.89	1.72	8.780	.001
Uterotonic agent given	Oxytocin	61	182		1			
	Misoprostol	2	1	5.96	7.96	.415	152.967	.169
	Misoprostol & Oxytocin	17	12	4.22	2.84	1.125	7.17	.027
Parity category	1-4	74	188		1			
	≥5	6	7	2.18	.96	.177	5.201	.962
Gestational Age Category	Full term	22	89		1			
	Early preterm	9	24	.83	.74	.244	2.266	.603
	Early term	20	51	1.69	.79	.355	1.763	.567
	Preterm	4	3	4.44	2.06	.349	12.219	.424
	Late term	25	28	12.46	2.95	1.37	6.32	.005
Birth weight	Normal	61	155		1			

Category	low	14	35	1.02	1.06	.376	2.980	.443
	Macrosomia	5	5	2.54	2.88	.567	14.641	.913
Current APH	Yes	5	6	.47	1.95	.413	9.210	.288
	No	75	189		1			

DISCUSSION

This study showed that the incidence of anemia after cesarean section was 29.09 % at study area. This result is comparable with study done at Tikur Anbassa Hospital with post partum anemia of 30% (12). Compared to the previous study in the south Ethiopia that accounted for 10% and 3.7% in SPHMMC (9), the current prevalence is very high. This gap might be due to type of health facility, methods of data collection, increased referral cases and absence of health facility that give similar service with current study area.

Mean age of women in this study is 27.39 years . This is comparable with mean age of women undergoing cesarean delivery in Cote d'Ivoire, Ethiopia 27.94 and 28.12years respectively (16,13).

The leading indication for cesarean delivery was non reassuring fetal heart rate pattern 32.0% Which is higher than study done in South Ethiopia 20.4% and this gap may be due to Hospitals setup . Emergency cesarean delivery was done for 87% of patients in this study which is comparable to other study done in Ethiopia 82.5%(2).

Transfusion rate in this study was comparable with other study done in South Ethiopia 3.3% and 5.3% respectively. Rate of transfusion after cesarean delivery was in line with study done in Denmark which is 3.00% after cesarean delivery(10). It is lower than study done in Nigeria with post cesarean transfusion rate of 20.8% (5). This gap may be due to all most all of patients in this study have no pre delivery anemia as compared to study in Nigeria were most patient had antepartum hemorrhage and pre-delivery anemia.

Previous scar was the second leading among indications of caesarean section which was 57 (20.73%). This is in line with study conducted in South Africa and sub-Saharan Africa

revealed that previous scar was among commonest risk factor. Women who administered general anesthesia during surgery were more likely to become anemic post caesarean when compared with those given spinal anesthesia. This finding is similar with study conducted in south Ethiopia in which administration of general anesthesia associated with maternal complication post caesarean delivery(3). These similarities could be due to similar socio economic status, geographic relation to current study area.

The below are significant (new findings) in which there were no association seen between post caesarean anemia with independent variables. The study showed that women with twin gestation were associated with anemia post caesarean delivery than those with singleton gestation. Gestational age had positive significant association with post caesarean anemia. Women in late term gestational (41-42 weeks) were more likely to develop anemia post caesarean period when compared with those in full (39-40) gestational age. This finding may be incidental finding. The study also revealed that women who undergone emergency caesarean section were highly related to development of post caesarean anemia when compared with elective one.

Limitation of the study

- There may be temporal relationship on this study due to study design
- Since secondary data was used patient characteristics like body mass index that can affect blood loss was not included during data collection.
- It is better if study was on multi center which can represent the population .

CONCLUSSION AND RECOMMENDATION

Conclusion

The prevalence post caesarean section anemia is too high when compared with the profound figure that was reported in other studies in different countries. It is also higher than studies

conducted in our country including the study conducted in the same area. Being twin gestation, administration of general anesthesia during operation, being late term pregnancy and emergency type of caesarean section were found to be significantly associated with post caesarean anemia. Majority of these factors might be manageable by early detection of any obstetric complications during ANC service, labor and delivery.

Recommendations

Based on the finding, the following recommendations were forwarded.

1. The health care providers should give high attention for those multiple gestation during ANC visit for early identification of problems and prevent complication that will lead them to caesarean section specifically to decrease rate of emergency surgery.
2. The hospital should use spinal anesthesia during procedure as much as possible as general one is highly associated with anemia after the procedure.
3. Residents who are doing cesarean section should minimize blood loss during the procedure

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DECLARATION

I, the undersigned agrees to accept responsibility for the scientific, ethical and technical conduct of the research thesis and declare that this thesis is my original work in partial fulfillment of the requirement for the post graduate study in OBYGYN.

I also declare that it has never been presented in this or any other university and that all resources and materials used in the thesis have been duly acknowledged.

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