MEDWIN PUBLISHERS
Committed to create value for Researchers

Open Access Journal of Gynecology
ISSN: 2474-9230

Critical Appraisal of Obstetric Hysterectomy from a North Indian Tertiary Care Health Facility over a Fifteen Year Period

Gupta M[1], Marwah S[2]* and Das B[3]

[1]Associate Professor, Department of obstetrics and gynaecology, VMMC & Safdarjung Hospital, India

[2]Assistant Professor, Department of obstetrics and gynaecology, VMMC & Safdarjung Hospital, India

[3]Professor Department of obstetrics and gynaecology, Faculty of Medicine and Health Sciences, SGT University, India

***Corresponding author:** Sheeba Marwah, Assistant Professor, VMMC & Safdarjung Hospital, New Delhi, India, Tel: 9871554989; Email: sheebamarwah901@gmail.com

Research Article

Volume 4 Issue 1

Received Date: March 20, 2019

Published Date: April 03 , 2019

DOI: 10.23880/oajg-16000171

Abstract

Aims & Objectives: (a) To critically analyse obstetric hysterectomies in a tertiary care government centre over a period of one year in relation to incidence, indication and risk factors, and maternal and perinatal outcome. (b) To compare the present data with similar data collected seven years and fourteen years back in same hospital.

Methods: All the patients undergoing obstetric hysterectomy during the period from January 2016 to December 2016 in department of Obstetrics and Gynaecology, VMMC and Safdarjung Hospital, New Delhi were included in the study. Their detailed obstetric history, indications leading to hysterectomy, risk factors, postoperative maternal complications and perinatal outcome was noted, analysed and compared to similar data collected in the year 2001 and 2008 in Safdarjung hospital.

Results: The incidence of obstetric hysterectomy in the year 2016 was 1.89/1000, 0.8/1000 deliveries in 2008 and 1.5/1000 deliveries in 2001. Maternal mortality was 34.6% in 2016, 18.28% in 2008 while 20.68% in 2001. The main indications leading to hysterectomy were rupture uterus, atonic postpartum haemorrhage (PPH), abnormal placentation, secondary PPH all these years. Perinatal outcome was comparable over the 15 year study period.

Conclusion: Though incidence of obstetric hysterectomy had slightly decreased over the years initially, but owing to influx of more unbooked cases in grave condition, it has shown a gradual increase in 2016. This underlines the absence of much necessitated improvement in the community health services, which is especially evident by high percentage of obstructed labour cases contributing to hysterectomy.

Keywords: Obstetric Hysterectomy; Audit

Introduction

Obstetric hysterectomy (OH) is described as extirpation of the uterus, during cesarean section or following vaginal delivery, or within the puerperium period. It was originally devised in 1871 as a surgical attempt to manage life threatening obstetric haemorrhage and sepsis, pioneered by Joseph Cavallini, Horatio Storer, Edward Porro, Lawson Tait etc., [1-3]. It can be either emergent or elective. Emergency OH has been customarily performed in the setting of inexorable and life-threatening obstetric hemorrhage [2-6]. However, several indications like uterine rupture, morbidly adherent placenta, and uterine sepsis [6-8].

Clinical proficiency and dexterities are imperative in making a prompt decision to operate before the patient's condition deteriorates, after meticulously weighing it as a last resort to save a mother's life, with sacrificing mother's reproductive capability. This minimises morbidity and mortality, as conclusion from the past pollsters have highlighted that morbidity is often associated with the conditions leading to OH, and not with the procedure itself [8-11]. Apposite timing and meticulous care may trim down or ward off numerous maternal complications [12-15].

In modern times, improved obstetric management, availability of new-fangled drugs like misoprostol, neoteric antibiotics and ready availability of blood products transfusion has brought down the incidence of emergency OH due to obstetric haemorrhage and obstructed labour, especially in developed nations [7-15]. However, incidence of OH due to morbidly adherent placenta is on a rise [1,16-22]. Thus, indirectly incidence of OH is an indicator of obstetric care dispensed in a health care facility, and in turn community [23-27].

Keeping this background in mind, the study was designed to critically appraise the incidence and causes of obstetric hysterectomies in a well-equipped 1500 bedded postgraduate tertiary care and teaching government hospital in the national capital and to provide an insight into the trends of etiology/ morbid factors associated with OH over two decades and scope for improvements in maternal health services, if any. This would further aid in formulating strategies for eminent reduction of maternal morbidity and mortality in the facility and the nation.

Materials and Methods

The case records of all the patients undergoing obstetric hysterectomy were studied in detail over a period of one year from January 2016 to December 2016 in department of Obstetrics and Gynecology, VMMC and Safdarjung Hospital, New Delhi. Hysterectomy done for any indication during pregnancy, labour and puerperium was included. Also, those done for complications following pregnancy termination, such as perforation and sepsis.

Each case record was analysed in detail with respect to demographic data (age, parity, booked or emergency referred case), detailed obstetric history, indications leading to hysterectomy, type of surgical procedure performed, risk factors, postoperative maternal morbidity and mortality and perinatal outcome.

The data thus obtained was compared to similar data collected seven years back in the year 2008 and fifteen years back in 2001 in Safdarjung hospital to study and compare the pattern of changing trends in the incidence and causative factors over the period.

Data was decoded from case proformas and analysis was done after applying appropriate statistical tests.

Results

There were 51 cases of OH amongst 27127 deliveries in 2016, 22 cases were observed amongst 25535 deliveries in 2008 and 29 cases of OH amongst 19092 deliveries in the year 2001. An incidence of 1.8/10000 deliveries in 2016, 0.8/1000 deliveries in 2008 whilst 1.5/1000 deliveries in 2001(Table 1). Most of the obstetric hysterectomies in the year 2016 followed caesarean deliveries (82.35%). This was slightly higher than that observed in 2008(81.82%), and was almost double than that observed in 2001(44.83%) (Table 1).

Statistical data	2001	2008	2016	P Value	2001 vs 2008	2001 vs 2016	2008 vs 2016
Total deliveries	19092	25535	27127				
No. of Hysterectomies	29	22	51				
Incidence of obstetric hysterectomies (per 1000 deliveries)	1.5	0.8	1.89	0.007	0.0585	0.4203	0.0025

Following vaginal deliveries n (%)	16 (55.17)	4 (18.18)	9 (17.6)	0.0008	0.0098	0.001	1
Following caesarean deliveries n (%)	13 (44.83)	18(81.82)	42 (82.35)				

Table 1: Trends in Incidence of Obstetric hysterectomy over fifteen years.

Maximum patients in the year 2001 belonged to the age range of 21 to 25 years (48.29%), whereas the commonest age range in 2008 and 2016 was 26 to 30 years (40.9 and 43.13% respectively). Most of the patients presenting throughout the time periods were multipara (68.9% in 2001, 68.18% in 2008 and 58.82%in 2015) or grand multipara (1.03% in 2001, 27.27% in 2008 and 17.64% in 2016). Majority of patients studied in the three series were multiparous and unbooked/unsupervised in antenatal period. (Table 2).

Baseline characteristics	2001 n=29(%)	2008 n=22(%)	2016 n=51(%)	P value	2001 vs 2008	2001 vs 2016	2008 vs 2016
Age (years)							
<20	0	0	0	0.647	0.34	0.476	0.8863
21-25	14(48.29)	6	16				
26-30	10	9(40.90)	22(43.13)				
31-35	4	4	9				
>35	1	3	4				
Parity							
Primigravida	6	1	12	0.241	0.11	0.598	0.134
G2-G4	20(68.9)	15(68.18)	30(58.82)				
>G5	3	6	9				
Religion							
Hindu	19	15	33	0.615	0.679	0.395	0.985
Muslim	9	7	18				
Sikh	1	0	0				
Christian	0	0	0				
Others	0	0	0				
SE status (Modified Kuppuswami)							
Upper	0	0	0	0.865	0.713	0.967	0.474
Upper middle	1	0	2				
Lower middle	4	2	9				
Upper Lower	9	6	16				
Lower	15	14	24				
Residence							
Urban	1	0	1	0.679	1	1	1
Rural	28	22	50				
Booking Status							
Referred	24	20	45	0.658	0.684	0.729	1
Booked	5	2	6				

Table 2: Comparison of demographic and maternal characteristics.

Amongst the various causes of OH, atonic postpartum hemorrhage was found to be the commonest cause (44.8%) in the year 2001, whereas rupture uterus surpassed other causative factors both in 2008 (50%) and 2016 (35.29%) The major risk factor contributing to PPH in 2001 series was placenta praevia or abruption, whereas higher incidence of adherent placenta and operative intervention were the foremost contributing factors for PPH in 2008 and 2016 (Table 3).

Indications (Risk factors)	2001 n=29(%)	2008 n=22(%)	2016 n=51(%)	P value	2001 vs 2008	2001 vs 2016	2008 vs 2016
Morbidly adherent placenta	**3(10.3%)**	**5(22.7%)**	**12(23.52%)**	**0.331**	**0.267**	**0.233**	**0.82**
Post caesarean	1	4	5	0.107	0.293	0.115	0.043
Placenta previa	1	0	7				
Manual removal of placenta	1	1	0				
Rupture uterus	**5(17.3%)**	**11(50%)**	**18(35.29%)**	**0.045**	**0.0284**	**0.145**	**0.359**
Obstructed labour	2	5	6	0.578	0.732	0.7996	0.297
Scar dehiscence	3	5	12				
Trauma	0	1	0				
Atonic PPH	**13(44.8%)**	**3(13.6%)**	**12(23.52%)**	**0.032**	**0.031**	**0.085**	**0.529**
Cs following prolonged labour	7	1	5	**0.626**	**0.497**	**0.653**	**0.494**
Vag. Delivery following prolonged labour	3	2	4				
Instrumental delivery	2	0	5				
Manual removal of placenta	1	0	1				
PPH	**5 -17.2%**	**2 -9.1%**	**2 -3.92%**	**0.13**	**0.684**	**0.092**	**0.579**
placenta previa /abruption	4	0	1	**1**	**0.143**	**1**	**0.333**
Secondary PPH	1	2	0	**0.101**			
Following MTP Perforation	**2(6.8%)**	**0**	**2(3.92%)**	**0.454**	**0.4996**	**0.618**	**1**
Chorioamnionitis/ pyoperitoneum	**1 -3.4%**	**1 -4.5%**	**5 -9.8%**	**0.496**	**1**	**0.409**	**0.661**

Table 3: Indications and Risk factors for Obstetric hysterectomies.

Analysing the trends of risk factors over these years, it was found that important ones contributing to rupture uterus were dehiscence of previous uterine scar (45.45% in 2008 and 66.66% in 2016) and obstructed labour (45.45% in 2008 and 33.33% in 2016). Morbidly adherent placenta was the second most common cause for obstetric hysterectomy in 2008(22.7%) and 2016 (23.52%) (Table 3). Furthermore, all the cases of obstructed labour that required emergency obstetric hysterectomy were referred from outside and that too in late stage in labour in moribund condition with little scope for conservative management.

Majority of our patients in both the years underwent total hysterectomies (Table 4). Nevertheless, the percentage of subtotal hysterectomies increased in the 2008; and furthermore in 2016 indicating a trend towards more conservative surgical approach.

Type of hystertectomy	2001 n=29(%)	2008 n=22(%)	2016 n=51 (%)	P Value	2001 vs 2008	2001 vs 2016	2008 vs 2016
Subtotal	21(72.4%)	15(68.2%)	39(76.4%)	0.753	0.985	0.893	0.653
Total	8(27.6%)	7(31.8%)	12(23.5%)				

Table 4: Type of hysterectomies.

Most of the women had postoperative shock, pyrexia, paralytic ileus, and wound infection through all these years. Mortality was 17.64% in 2016 and 18.28% in 2008 as compared to 20.68% in 2001.

Discussion

Incidence of emergency OH in the present study was 1.8 % (2016) which is considerably higher when compared to conclusions from past investigators [1-5,28-32]. Marked differences in various researches conducted across different countries till date may be consequent to variable cesarean delivery rates, definitions, backdrops (population contrasted with facility based), and accessibility of additional treatments [1-3,10-15]. The incidence in this study is computed for cases presenting over one year at a stretch at three different time periods, whereas other reviews have given incidence over a period of three or more years [2-4,13-24,28-32]. Moreover, our hospital is one of the largest tertiary care referral center catering to patients all across northern India; as such most of the women were referred from outside peripheral

hospitals in moribund condition after complications occurred.

Comparing the trends of the incidence of OH over similar data collected over a period of 14 years from the same hospital, a significant drop in incidence of OH was observed in 2008, when contrasted with that of 2001. This can be attributed to increasing health awareness and practical impact of novel health initiatives across the country, particularly creating a roadmap to predict and prevent, and eventually combat haemorrhage in obstetrics [1-3]. Nevertheless, the upsurge of OH in 2016 could be ascribed to increasing cesarean delivery rates globally which may lead to a higher incidence of placental pathology [1,3,4].

Contrasting the demographic and baseline maternal characteristics over the years, mean age group was 24.5 years in 2001, but 26.2 years in 2008 and 27.12 in 2016. This significant variation in the latter data is explained by delayed marriage and increasing infertility in recent times. High multiparity rate for those undergoing OH fortifies the fact that postpartum hemorrhage snowballs with high parity, a risk factor for uterine atony [1-4,13,19]. Another justification for reduced risk of hysterectomy in nullipara is absence of prior caesarean delivery [1,4]. In comparison with previous research studies [1,3-5,13-15,18-20], a relatively younger women in the present study echoes a younger age at matrimonial alliance and conception in India. Another striking observation in our data was that most of them were un-booked with no prior antenatal supervision, hailing mostly from lower socioeconomic background. This majorly reflects towards the population base the hospital caters to. It also exposes the felt need to segregate truly unregistered women from referred patients having received antenatal care outside the center of study, to gauge the penetration of essential obstetric services in the country, and propose effective interventions to increase the gamut of the same [2,4].

Table 5 describes a comparative evaluation of incidence of OH and its risk factors by various researchers in recent times.

Study Author/year	Duration	No of deliveries	Incidence of OH	Most common Risk Factors/causes	Mortality
Sinha and Mishra [4]	7 years	15461	0.38%	High parity, PPH	9.70%
Mukherjee, et al. [5]			0.15%		
Kanwar, et al. [6]	5year	15461	0.32%		
Praneshwari Devi, et al. [7]	5 year	33371	0.08%		
Najam R, et al. (2010)	32 months	2388	10.05	High parity, ruptured uterus	12.50%
Fatima, et al. (2011)	2year	12642	4/1000	Uterine rupture	8.70%
Carvalho, et al. (2012)	10 year	31767	0.41/1000	Uterine atony, placenta previa	1 MM
Mirza, et al. (2013)	1year	11356	0.17%	Ruptured uterus, atonic PPH	15%
Saha, et al. (2014)	1year	1796	4.45%	Obstetric haemorrhage, severe preclampsia	66.66%
Pan, et al. (2015)	10year	18838	1/1000	Placenta accreta, previous cesearean delivery.	-
Chawla, et al. (2015)	8 years	67572	0.08/1000	Atonic PPH , placenta accreta	28.60%
Shirodkar, et al. (2016)	7.5 years	28207	0.16%	Multiparity, rupture uterus, morbidly adherant placenta	2.20%
Sharma, et al. (2016)	5 year	8084	0.37%	Morbidly adherent placenta	60%
J Chester, et al. (2016)	10year	-	0.8/1000	High parity,Uterine atony, placenta previa,	-
Akker, et al. (2016)	25 year Meta-analysis	-	0.2-10.1	Cesearean delivery, placental pathology, uterine atony	0-59.1%
Malik, et al. (2017)	1 year	2223	0.49%	Rupture uterus and PPH	27.27%
Present study	14year trends				
2001	1 year	19092	**0.15%**		
2008	1 year	25535	**0.08%**		
2016	1year	27127	**0.18%**		

Table 5: Comparative incidence of obstetric hysterectomy.

Reviewing the causes for hysterectomy, PPH (62%) [Especially atonic PPH] emerged as the most common indication for obstetric hysterectomy in 2001. This was similar to the inferences of Agashe (60%) and Marathe and Kant, et al. However rupture uterus outdid other indications in 2008 (50%) and 2016 (35.29%). This was akin to conclusions by many recent authors including Mantri, et al. (60%) and Ambiye and Venkatraman (67.8%) [2-6,29-32].

A significant decrease in incidence of PPH as a cause of obstetric hysterectomy in 2016 and 2008, when compared to 2001 shows that there is a considerable improvement in medical management available for PPH. Readily available oxytocics, prostaglandins and transfusion facilities in institutional set up, coupled with contemporary interventions (B-Lynch sutures, Cho sutures, Hayman technique and arterial embolization) contribute towards this effect [1-3,7-13]. It also emphasizes the widespread emergency and essential obstetric services imparted even in the primary centres.

But, high incidence of rupture uterus as a major cause of obstetric hysterectomy in 2008 and 2016, even in this present era of modern obstetrics, reflects poorly on the peripherally available health services in terms of clinical proficiency and adept labour monitoring services, especially during trials of labour after caesarean delivery, and inadequate and delayed referral services [1-4]. Lack of awareness about regular antenatal visits among women, and deficient number of skilled birth attendants in the local villages having erudition about timely intervention, especially transferring for institutional deliveries in time, also contributes to associated calamitous obstetric complications [27-32].

Evaluating the risk factors, the eminent ones were dehiscence of previous uterine scar and obstructed labour. The association between prior history of cesarean delivery and hysterectomy is consistent with previous studies [1-4]. It has been recently concluded that nations with high cesarean delivery rates had higher hysterectomy prevalence statistics compared with those with lower rates [1,4]. Also, compared with vaginal delivery in unscarred uteri, vaginal birth following cesarean delivery and repeat cesarean delivery carry higher risks of hysterectomy [1-6].

Morbidly adherent placenta was the second most common cause for obstetric hysterectomy in 2008(22.7%) and 2016 (23.52%). Furthermore, all the cases of obstructed labour that required emergency obstetric hysterectomy were referred from outside and that too in late stage in labour in moribund condition with little scope left for conservative management.

Postoperative shock, pyrexia, paralytic ileus, and wound infection were common complications observed through all the years. Surgical complications may be strengthened by placental pathology altering anatomy of lower uterine segment and pelvis and amplified blood supply to pelvic organs during pregnancy [2-6,19-25]. Prolonged labour, intrauterine manipulation and dormant sepsis probably explain these complications. These could be prevented by early referral of such cases to well-equipped centres which can treat emergency obstetric cases promptly and efficiently [2-5,28-32]. The mortality amongst our patients was 17.64% in 2016 and 18.28% in 2008 as compared to 20.68% in 2001. This was akin to various other studies have reported mortality in the range of 9.3% to 32% [2-5,15-24]. A decline in mortality in OH patients over these years is certainly a pat on the back on the available clinical expertise and proficient management offered at the present facility. Also deployment of innovative strategies including community based assessment of communication and transportation system, and inculcation of modern technologies in the hospital health delivery system like use of mobile phones would reduce delayed decision-making and transportation during childbirth. At the same time, these results encourage all for provision of a continuum of expert care to a woman from the start of the pregnancy all the way through her post-partum period, for preventing the preventable, as much as we can, for saving her life, and in the pursuit of achieving the sustainable health development in our country.

Conclusion

Incidence of EOH has come down over the years, and PPH is no more the major contributing factor for the same, which suggests improvement in institutional intrapartum management. Increase in caesarean deliveries in the present era has led to increased incidence of previous scar dehiscence and adherent placenta. Thus, caesarean delivery should judiciously be performed. A high percentage of obstructed labor cases, which are referred late to institutions, still contribute to OH, reverberating a scope for much needed improvement in the community health services. Awareness regarding the need for proper antenatal and intra-natal care and availability of adequate and prompt referral services are cardinal prerequisites to avoid this life saving, but undesired procedure. Community edification towards institutional deliveries or by trained dais would prevent many such emergencies. The proportion of maternal deaths associated with OH

and its indications can be prevented by skilled maternal care, active management of labor, early recognition of complications, timely referral, and effortlessly available conveyance and blood transfusion amenities. Also, well-trained and experienced obstetricians are vital in taking a prompt decision which would go a long way in saving mothers' lives.

References

1. Akker TVD, Brobbel C, Dekkers OM, Bloemenkamp KWM (2016) Prevalence, Indications, Risk Indicators, and Outcomes of Emergency Peripartum Hysterectomy Worldwide. Obstetrics & Gynecology 128(6): 1281-1294.

2. Malik S, Kaur K, Kaur P (2017) Obstetric hysterectomy: a ray of hope for a dying mother. Indian Journal of Obstetrics and Gynecology research 4(1): 83-85.

3. Takahashi H, Ohkuchi A, Usui R, Suzuki H, Baba Y, et al. (2016) Factors Contributing to Massive Blood Loss on Peripartum Hysterectomy for Abnormally Invasive Placenta: Who Bleeds More? Obstet Gynecol Int 2016: 5349063.

4. Sturdee DW, Rushton DL (1986) Caesarean and postpartum hysterectomy. Br J Obstet Gynecol 93(3): 270-274.

5. Shirodker SD, Pandey A, Yadav S (2016) Emergency obstetric hysterectomy: review at a tertiary care hospital. Int J Reprod Contracept Obstet Gynecol 5(11): 3811-3814.

6. Chawla J, Arora D, Paul M, Ajmani NS (2015) Emergency Obstetric Hysterectomy: A Retrospective Study from a Teaching Hospital in North India over Eight years. Oman Medical Journal 30(3): 181-186.

7. Miller S, Lester F, Hensleigh P (2004) Prevention and treatment of postpartum hemorrhage: new advances for low-resource settings. J Midwifery Womens Health 49(4): 283-292.

8. Chou MM, Kung HF, Hwang JI, Chen WC, Tseng JJ (2015) Temporary prophylactic intravascular balloon occlusion of the common iliac arteries before cesarean hysterectomy for controlling operative blood loss in abnormal placentation. Taiwanese Journal of Obstetrics and Gynecology 54(5): 493-498.

9. Cali G, Forlani F, Giambanco L, Amico ML, Vallone M, et al. (2014) Prophylactic use of intravascular balloon catheters in women with placenta accreta, increta and percreta. Eur J Obstet Gynecol Reprod Biol 179: 36-41.

10. Omar HR, Sprenker C, Alvey E, Hoffman M, Karlnoski R, et al. (2015) The value of occlusive balloons in the management of abnormal placentation: a retrospective study. Journal of Obstetrics and Gynaecology 36(3): 333-336.

11. Salim R, Chulski A, Romano S, Garmi G, Rudin M, et al. (2015) Precesarean prophylactic balloon catheters for suspected placenta accreta a randomized controlled trial. Obstetrics & Gynecology 126(5): 1022-1028.

12. Singhal S, Singh A, Raghunandan C, Gupta U, Dutt S (2014) Uterine artery embolization: exploring new dimensions in obstetric emergencies. Oman Med J 29(3): 217-219.

13. Bhat S, Bhave S (2016) Obstetric Hysterectomy a lifesaving procedure and its complication. Int J Med and Dent Sci 5(1): 996-1001.

14. Mukherjee S, Agrawal L, Dahiya S, Amrin S, Singh P (2016) A retrospective study of obstetric hysterectomy in a tertiary care hospital. Int J Med Sci Public Health 5(8): 1644-1646.

15. Jadav SN, Nanda S, Panchal G, Desai MR (2014) Study of Emergency Obstetric Hysterectomy. International Journal of Scientific Research 3(2): 341-342.

16. Varghese S, Gokulam N, Abri SA (2012) Uterine Artery Embolization in Postpartum Hemorrhage: A Case Report. Oman Med J 27(2): e033.

17. Tapisiz OL, Altinbas SK, Yirci B, Cenksoy P, Kaya AE, et al. (2012) Emergency peripartum hysterectomy in a tertiary hospital in Ankara, Turkey: A 5-year review. Arch Gynecol Obstet 286(5): 1131-1134.

18. Awan N, Bennett MJ, Walters WA (2011) Emergency Peripartum Hysterectomy: a 10 year review at the Royal Hospital for Women, Sydney. Aust N Z J Obstet Gynaecol 51(3): 210-215.

19. Knight M, UKOSS (2007) Peripartum hysterectomy in the UK: management and outcomes of the associated haemorrhage. BJOG 114(11): 1380-1387.

20. Forna F, Miles AM, Jamieson DJ (2004) Emergency peripartum hysterectomy: a comparison of cesarean and postpartum hysterectomy. Am J Obstet Gynecol 190(5): 1440-1444.

21. Kant A, Wadhwani K (2005) Emergency obstetric hysterectomy. J Obstet Gynecol India 55(2): 132-134.

22. Ahmad SN, Mir IH (2007) Emergency Peripartum Hysterectomy: Experience at apex hospital of Kashmir Valley. The internet journal of gynecology and obstet 8(2): 1-4.

23. Marwaha P, Kaur M, Gupta A (2008) Peripartum Hysterectomy-a five years study. J Obstet Gynecol India 58(6): 504-506.

24. Gupta S, Dave A, Bandi G (2001) Obstetric hysterectomy in modern day obstetrics. J Obstet Gynecol India 51: 91-93.

25. Praneshwari Devi RK, Singh N, Singh D (2004) Emergency Hysterectomy: A study of 26 cases over a period of 5 years. J Obstet Gynecol 54: 343-345.

26. Sinha H, Mishra M (2001) Hysterectomy for obstetric emergency. J Obstet Gynecol India 51: 111-114.

27. Mukherjee P, Mukherjee G, Das C (2002) Obstetric hysterectomy-A review of 107 cases. J Obstet Gynecol India 52(6): 34-36.

28. Kanwar, Sood P, Gupta KB (2003) Emergency hysterectomy in obstetrics. J Obstet Gynecol 53: 350-352.

29. Agashe AP, Marathe SS (1991) Obstetric hysterectomy (A review of 50 cases from January 1987 to August 1990). J Obstet Gynecol India 45: 490-493.

30. Mantri L, Maheshwari K, Chandra (1995) Emegency hysterectomy-A ten years review. J Obstet Gynecol India 43: 936-939.

31. Ambiye VR, Venkatraman L (1988) Hysterectomy in obstetrics. J Obstet Gynecol India 38: 318-321.

32. Allahabadia G, Vaidya P (1991) Obstetric hysterectomy (A review of 50 cases from January 1987 to August 1990). J Obstet Gynecol India 41: 634-637.