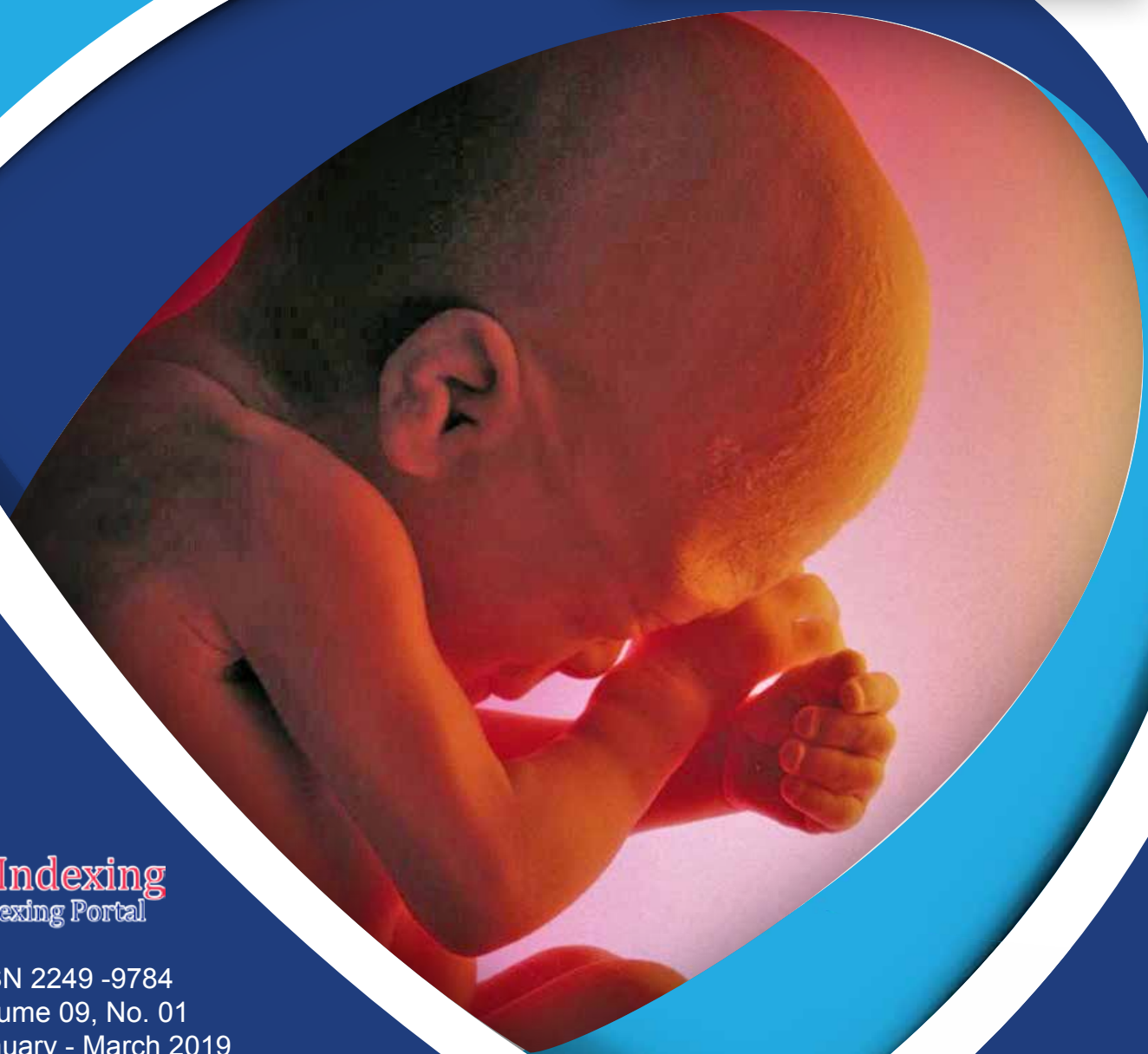
INDEX COPERNICUS INTERNATIONAL
ICV 2017 = 70.99



IPIndexing
Indexing Portal

ISSN 2249 -9784
Volume 09, No. 01
January - March 2019

IJOPARB

Indian Journal of Perinatology and Reproductive Biology

Official Journal of Indian Society of Perinatology and Reproductive Biology

IPIndexing
Indexing Portal

CERTIFICATE FOR INDEXING (IPI Value 2018)

This Certificate is Awarded to

Indian Journal of Perinatology and Reproductive Biology

P-ISSN: 2249-9784

Evaluation of the above journal for the year 2018 has been accepted and indexed in IP Indexing.

IPI Value of the above journal for the year 2018 is 2.22.

Website: http://www.ipindexing.com

Evaluation Head

IPI Value is valid for one year from the issuance of Certificate.

IJOPARB

Indian Journal of Perinatology and Reproductive Biology

Vol. 09 | No. 01 | January - March 2019 | ISSN 2249-9784

INDEX COPERNICUS INTERNATIONAL

Official Journal of
INDIAN SOCIETY OF PERINATOLOGY AND REPRODUCTIVE BIOLOGY (ISOPARB)

Indian Society of Perinatology and Reproductive Biology

Estd. 1978

(Reg No. 71 of 1978-1979 under the Societies Registration Act 21 of 1860)

Executive Committee (2018-2019)

President	Dr Suchitra N. Pandit	09820416474
Secretary General	Dr Meena Samant	09334105945
Immediate Past President	Dr Milind R. Shah	09822096280
Editor-in-Chief	Dr Hiralal Konar	09433033225
Vice Presidents	Dr Arup Kumar Majhi	
	Dr Narayan Jana	
	Dr Gangadhar Sahoo	
	Dr Shanti H. K. Singh	
Treasurer	Dr Pragya Mishra Chaudhary	09835273668
Communicator	Dr Supriya Jaiswal	09431207284

Zonal Chairpersons

East Zone	Dr Ojaswani Patel
West Zone	Dr Parul Kotdawala
North Zone	Dr Anjoo Agarwal
South Zone	Dr Rooma Singh

Executive Members

Patna	Dr Abha Rani Singh
Patna	Dr Amita Singh
Ranchi	Dr Archana Kumari
Kolkata	Dr Biswajyoti Guha
Chennai	Dr Lakshmi Ravindran
New Delhi	Dr Mala Srivastava
Lucknow	Dr Rajul Tyagi
Patna	Dr Rita Kumari Jha
Hyderabad	Dr S. Madhumathi
Kolkata	Dr Sukumar Barik
Chennai	Dr Vijay Lakshmi Seshadri
Lucknow	Dr Yashodhara Pradeep

Head Office:

IMA Building, Dr A. K. N. Sinha Path, South East Gandhi Maidan, Patna 800004
Web: www.isoparb.org

Secretary General's Office

Dr Meena Samant, Secretary General, ISOPARB
21/D, Road No 10, Rajendranagar, Patna - 800016
Phone: +91 93341 05945 | E-mail: meenasamant@rediffmail.com

Indian Journal of Perinatology and Reproductive Biology

CD 55, Sector I, Salt Lake City, Kolkata 700 064
E-mail: ijoparb1978@gmail.com

ISSN 2249-9784 RNI No. WB ENG/2010/39056

EDITORIAL BOARD

Editorial Office: CD-55, Salt Lake City
Sector-I, Kolkata 700064
Email: ijoparb1978@gmail.com

Contents

Editor's Choice

It's all about the society and the journal. While writing the Editor's Choice for this issue of IJOPARB, our memory of the 35th ISOPARB National Conference 2019, organized by the Hyderabad Society is very much fresh. Late in the afternoon tea break, a small group of ISOPARB members were debating the place of 'Minimally Invasive Surgery' (MIS) in this national platform of ISOPARB. I could see protagonists and antagonists were with strong views to continue the debate. I personally felt a conference of this magnitude had more to offer, besides upgrading our knowledge. Without referring much of the arguments and the counter arguments, what most of us like to see the issue in a different perspective. The pre lunch panel discussion was of high educational standard. It had much impact on the daily clinical practice. Most of the panel members were experts in their field and of national repute. The moderator of the session was so realistic and appropriate that, it attracted a huge audience. Many of them did not mind to listen to the whole session even without a chair to sit on. I am sure many of us will agree, surgery specially the MIS has got a place to improve the outcome of reproductive biology either as a standalone procedure or in combination with medical therapy.

Anyway, the members of ISOPARB had thoroughly enjoyed the 35th Conference at the Park Hyatt. The ambience, hospitality, cultural program and the dishes were of special attraction.

In the general body meeting, we the members of the editorial board were given a special appreciation. Good news was that, IJOPARB appeared in the Index Copernicus International (ICI) journals master list. IJOPARB waited to be indexed by an international body over the years. Thanks to the member bodies of the editorial board, for their untiring effort to improve the quality of the production with its contents and the appearance. We need to keep in mind that it is a continued effort to maintain the quality. This is essential to maintain the approval of Index Copernicus International. Members would happy to know that IJOPARB is also recognised by another body "IP Indexing" (Ref. http://www.ipindexing.com)

IJOPARB need to reach all the members. Members are requested to update their address to the office, as nearly 300 members could not be traced with their existing address.

IJOPARB is an educational and review journal. We publish limited articles to enable generalists to stay abreast of current researches and the controversies, which will be of help in patient care. We make sure that each article is factually correct. This hard work lies with our peer reviewers. We look forward for the feedback from our members. To strengthen the process, we welcome more contributors and reviewers for the journal. Let us know your area of expertise, so that we can add your name in our list of reviewers and in the editorial board.

This issue of the journal has articles exclusively with obstetric problems. Surgical and medical disorders have been presented. With the progressive decline in direct causes of maternal deaths, the indirect causes are proportionately on the rise. ISOPARB, since inception encourages to work with the colleagues of related disciplines, to improve maternal and perinatal health.

The general body meeting at Park Hyatt, Hyderabad appeared exceptional to me when compared to my experience of attending all such meetings at the state, national and international levels.

I could see a few esteemed senior members of the society, opted to discuss the journal issues on priority to begin with. No doubt that journal of any society is the mirror to see the society. Great news is that we are a ever increasing body with progressive new membership.

The Editor-in-Chief, on behalf of the journal committee, thanks sincerely the Executive Body members, members of the editorial board and all members of the society for their kind support and suggestion.

Prof (Dr) Hiralal Konar
Editor-in-Chief
MBBS (Cal), MD (PGI), DNB, MNAMS, FACS (USA) FRCOG (London)
FOGSI Representative to Asia Oceania Federation of Obstetricians and Gynaecologists (AOFOG)
Chairman, Indian College of Obstetricians and Gynaecologists (ICOG), 2013
Consultant Obstetrician & Gynaecologist
Calcutta National Medical College and Hospital, Kolkata

Original Article: Obstetrics

Analysis of Rising Cesarean - Section trends in a Tertiary Care Referral Hospital in South-Western Punjab, India

Shivali Bhalla,[1] Seema Grover Bhatti L[2]

Abstract

Aim: Cesarean section rates have increased considerably over last few years, hence, posing unnecessary risks to both mother and neonates. An internationally accepted classification is much needed to scientifically analyse this issue. The present study was conducted to analyse the rising cesarean section trends at this hospital using Robson's Ten Group Classification System.

Materials & Methods: This was a retrospective study including patients who had undergone vaginal delivery or cesarean section during the year 2017 in this hospital. The patients were grouped using Robson Ten Group Classification system into 10 groups. Size of each group, group specific cesarean section rates and percentage contribution by each group to the overall cesarean section rates was studied.

Results: The Cesarean Section Rates have increased considerably over a last few years with the rates as high as 42.76% in 2017. 1768 women delivered 1820 babies. The mean maternal age was 26.17 years and mean gestational age was 37.82 weeks. Scar tenderness /dehiscence in patients with history of previous one or more cesarean sections was the most common indication for cesarean section in present study (26.7 %) followed by mal position & mal-presentations (17.2%) and fetal distress (10.7%). The contribution of each group to the overall cesarean section rate in descending order was: Group 5 (10.6%), Group 2 (8.9%), Group 1 (5.8%), Group 9 (4.9%), Group 6 (3.9%), Group 7 (2.6%), Group 10 (2%), Group 8 (1.7 %) and Group 4 (1.2%), Group 3 (1.1 %).

Conclusions: Cesarean section rates, whether high or low , are not a marker of quality care on their own. Analysing cesarean section rates using the Robson's Ten Group Classification System, however, is a marker of quality care as it assesses the maternity care based on epidemiological information, maternal and fetal events and outcomes.

1. M.D., Senior Resident, Department of Obstetrics & Gynaecology, Guru Gobind Singh Medical College & Hospital, Faridkot, Punjab, India
2. M.D., Professor & Head of Department, Department of Obstetrics & Gynaecology, Guru Gobind Singh Medical College & Hospital, Faridkot, Punjab, India.

Corresponding author: Seema Grover Bhatti L. E-mail: groverseema4@gmail.com

Introduction

The debate on appropriate Cesarean Section Rates (CSR) is one of the most controversial issues in obstetrics. CSRs vary considerably among various labour and delivery units, being too high in some and very low in others. Overall, the CSRs have increased considerably over last few decades. Differences in management of labour at different units, higher patient expectations, medico-legal implications, advanced maternal age, obesity and recently maternal choice are the most important underlying factors responsible for increased CSRs. According to World Health Organisation (WHO), regional CSRs should not exceed 10–15%[1] as rates higher than these are not associated with reduction in maternal and neonatal mortality.[2,3] Though the crude rate of cesarean section is an important indirect global indicator for measuring access to obstetric services,[4] yet its ever rising trend is posing risks to both mother and neonates.[5]

An internationally accepted classification was needed to scientifically analyse this issue. In 2011, Torloni and colleagues[6] reviewed 27 cesarean section classification systems and identified the Ten-Group Classification System (TGCS) proposed by Robson in 2001[7] as the most appropriate to compare surgery rates between institutions, countries and time points. The same has been recommended by WHO in 2014 and FIGO in 2016.[8,9] TGCS is simple, robust, easily reproducible, and flexible.[10] It classifies all cesarean sections into various mutually exclusive but totally inclusive groups on the basis of following variables: obstetric history (parity and previous cesarean section), onset of labor (spontaneous, induced, or cesarean section before onset of labor), fotal presentation or lie (cephalic, breech, or transverse), number of fetuses, and gestational age (preterm or term). Using this classification, the size of the groups and the CSRs within the groups provides significant information about the type of care being provided in that institution. The present study was conducted to analyse the rising CSRs at this hospital using Robson's Ten Group Classification System.

Materials and Methods

It is a retrospective study including all patients who underwent vaginal or cesarean delivery during the year 2017 in this hospital. Hospital records were analysed and relevant information recorded. Data was analysed using SPSS 20. The patients were grouped using Robson Ten Group Classification system into 10 groups.

Size of each group, group specific CSRs and percentage contribution of each group to overall CSR was studied. Results were presented as percentages, means and frequencies.

Size of group (%) = number of women in each group (B)÷ Total number of women in the population (C) x 100

Group specific CSR (%) = number of cesarean sections carried out in each group (A) / number of women in each group (B) x 100.

Contribution of each group to overall CSR (%) = number of cesarean section in each group (A)/total number of women in the population (C) x 100.

Results

CSRs at this hospital have increased considerably over a last few years with 5 year (2012-2017) CSR of 42.08%, annual rate being 32.06% in 2012 and 42.76 % in 2017. This increase is statistically significant. (Chi square value: 37.76; P value: 0.000; Extended Mantel Haenszel's test for chi – square for linear trends). The number of deliveries also increased from 1070 in 2012 to 1768 in 2017 (Table 1 & Figure 1). Total 1768 women delivered 1820 babies. Majority of the women were aged between 25-29 years (38.3 %). The mean maternal age was 26.17 years (median 26 yrs; Range 18-43 yrs; SD 4.749). Majority of the patients (51.8 %) were nulliparous. The mean gestational age was 37.82 (SD: 2.381) with 58% between 37-<40 weeks of pregnancy. (Table 2).

Scar tenderness /dehiscence in patients with history of previous one or more cesarean sections was the most common indication for cesarean section (26.7 %) followed by mal position and mal-presentations (17.2%) and fetal distress (10.7%). Patients with severe pre-eclampsia /eclampsia accounted for 9.4 % of cesarean sections. (Figure 2).

Majority of the women, 355 (20.1%) were in group 1 followed by 333 (18.8 %) women in group 3 and 279 (15.8 %) in group 2. Group 1 was larger than Group 2 & Group 3 was larger than Group 4. Group 5 & Group 4 included 219 (12.4 %) & 188 (10.6 %) women respectively. Nulliparous women with breech presentations were 89 (5%) (Group 6) and multiparous

breech (Group 7) were 60 (3.4 %). The smallest group was 8th, with 2.9 % women with multiple pregnancy. Group 9 included 5 % women with abnormal lie. Group 10 included 6% women (Table 3; Column 3&4). Within groups, CSR was 100% in Group 9 followed by Group 5 (85.4%), Group 6 (78.7 %) and Group 7 (76.7%). Group 8 had CSR of 58.8%. CSR was higher (56.3%) in group 2 than (28.7%) group 1 and was lower in Group 3 (6%) than Group 4 (11.2%). Group 10 had 33% CSR (Table 3; Cloumn 5). The contribution of each group to the overall CSR (42.7%) in descending order was: Group 5

(10.6%), Group 2 (8.9%), Group 1 (5.8%), Group 9 (4.9%), Group 6 (3.9 %), Group 7 (2.6 %), Group 10 (2%), Group 8 (1.7%) and Group 4 (1.2%), Group 3 (1.1 %). (Table 3; Column 6).

The indications for cesarean section in group 1 were classified on the basis of those carried for fetal reasons (no oxytocin used) and those done in patients with dystocia (where oxytocin was used but there was failure to progress in labour.[11] Dystocic labour was further classified into: Inefficient Uterine Action or IUA (labor progressing at < 1 cm /hr from its initiation) and Efficient Uterine Action or EUA (labor progressing at > 1 cm /hr initially but subsequently failed to progress). For dystocia subdivision IUA, Poor Response (Dyst/IUA/PR) was described when labor

Table 2: Demographic profile of the patients. (N=1768)

S No	Parameter	Number of Patients (Based on Mode of Delivery) VD	CS	Percentage of Patients	Mean	S.D.
1	Age (years)					
	18-24	371	280	36.8 %	26.17	4.749
	25-29	390	287	38.3%		
	30-35	205	154	20.3%		
	>35	46	35	4.6 %		
2	Parity					
	Nulliparous	916		51.8 %	-	-
	Multiparous	852		48.2%		
3	Gestational Age (weeks)				37.82	2.381
	< 34	104		5.9 %		
	34 - <37	200		11.3 %		
	37 - <40	1026		58.0 %		
	>= 40	438		24.8 %		
4	Number of Foetuses					
	Single	1717		97.1%	-	-
	Twins	50		2.8%		
	Triplets	1		0.1%		

VD- vaginal delivery; CS- cesarean section; SD-standard deviation

Table 1: Year wise cesarean section rates, number of vaginal deliveries and cesarean sections in present study.

S No	Year	Total Number of Deliveries	Number of Vaginal Deliveries	Number of Cesarean Sections	Year Wise Cesarean Section Rate (Csr)
1	2012	1070	727	343	32.06 %
2	2013	1299	783	516	39.72%
3	2014	1510	880	630	41.72%
4	2015	1775	960	815	45.91%
5	2016	1646	890	756	45.92%
6	2017	1768	1012	756	42.76%
Total	2012-2017	9068	5252	3816	42.08 %

Overall 5 year CSR of 42.08 %, annual rate being 32.06% in 2012 and 42.76 % in 2017.

Increase is statistically significant. (Chi square value: 37.76; P value: 0.000; Extended Mantel Haenszel's test for chi – square for linear trends).

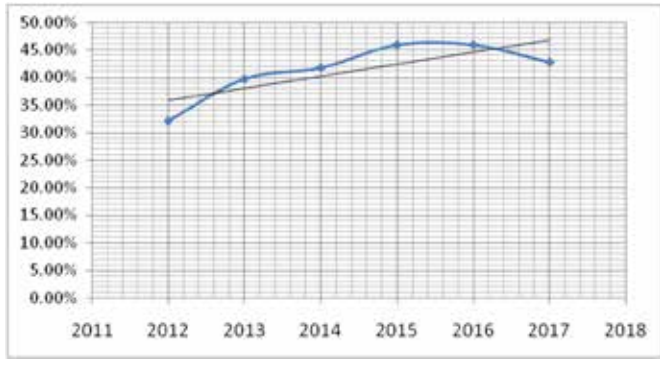


Figure 1: shows increasing trend for ceserean section over a period from 2012-2017.

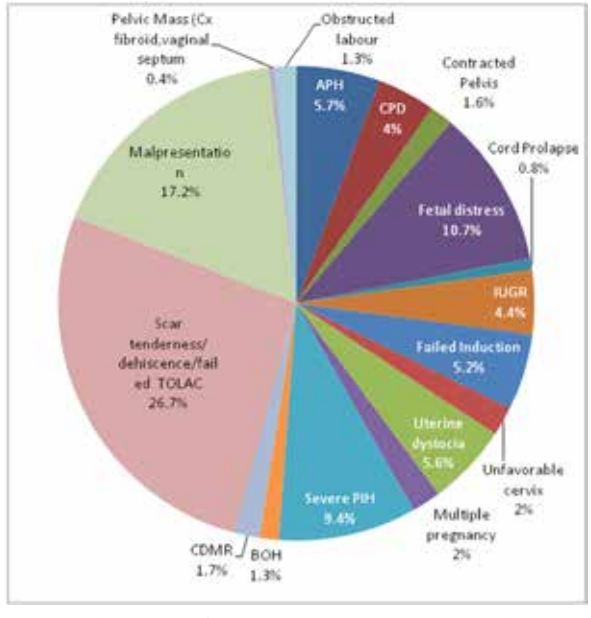


Figure 2: Indications of cesarean sections among study population.

(TOLAC-Trial of Labour After Cesarean; CPD-Cephalo-pelvic disproportion; IUGR-Intra-uterine Growth Restriction, PIH- Pregnancy Induced Hypertension, BOH-Bad Obstetric History, CDMR– Cesarean Delivery on Maternal Request.)

failed to progress even when the dose of oxytocin prescribed reached maximum recommended dose. Subdivision IUA, inability to treat over contraction (Dyst/IIT/OC) was used when maximum dose of oxytocin could not be used because the uterus over contracted. Similarly, IUA, fetal intolerance (Dyst/IIT/FI) described when maximum dose of oxytocin could not be used as fetus did not tolerate this dose and there was evidence of fetal distress. IUA/no oxytocin implied when no oxytocin was used for other varied contra-indications. EUA was divided into cephalo-pelvic disproportion or mal-position. In the present study, in Group 1, the highest subgroup of patients contributing to group CSR were those with IUA/IIT/FI (9.86%) followed by cases of fetal distress (7.04 %) (Table 4). Among Group 2 patients, (N=279); 192 had undergone labor induction with pre-eclampsia /eclampsia and post-dated pregnancy as the most common indications (24% & 14.7% respectively) (Table 5a). Indications for pre-labor cesarean sections in Group 2 are depicted in Table 5b.

Group 5 (N= 187) contributed 10.6 % to overall CSR rate, hence making it the leading contributor to overall CSR. Majority of the cesarean sections performed in this group were emergency cesarean sections with scar tenderness / risk of scar dehiscence (52.4 %) as the most common indication followed by antepartum hemorrhage (12.8%). Trial Of Labor After Cesarean (TOLAC) was declined by 7.5 % of the eligible candidates (Table 6).

Discussion

In the present study CSR in 2017 was 42.76%, which is almost three times higher than the traditional WHO recommended highest rate of 15%.[3] Similar high rates were observed in study by Patel RV[12] (40%). The high CSR at this centre can be explained as to the fact that ours is the only referral centre for all district hospitals

Table 3: Ten Group Classification system for cesarean deliveries, Guru Gobind Singh Medical College & Hospital, Faridkot, Punjab, India 2017

Group		2017 756/1768 (42.7%) (Column 3)	Size of group, % (Column 4)	Group CSR (Cesarean section rate in group, %) (Column 5)	Contribution of each group to total CSR (42.7 %) (Column 6)
1	Nulliparous women with a single cephalic pregnancy, at greater than or equal to 37 weeks gestation in spontaneous labour.	102/355	20.1%	28.7 %	5.8
2	Nulliparous women with a single cephalic pregnancy, at greater than or equal to 37 weeks gestation who either had labour induced or were delivered by a cesarean section before labour	157/279	15.8%	56.3%	8.9
3	Multiparous women, without a previous uterine scar, with a single cephalic pregnancy at greater than or equal to 37 weeks in spontaneous labour.	20/333	18.8%	6.0 %	1.1
4	Multiparous women, without a previous uterine scar, with a single cephalic pregnancy at greater than or equal to 37 weeks who either had labour induced or were delivered by a cesarean section before labour.	21/188	10.6%	11.2%	1.2
5	All multiparous women, with at least one previous uterine scar and a single cephalic pregnancy at greater than or equal to 37 weeks gestation.	187/219	12.4%	85.4%	10.6
6	All nulliparous women with a single breech pregnancy.	70/89	5%	78.7%	3.9
7	All multiparous women with a single breech pregnancy including, women with previous uterine scars	46/60	3.4%	76.7%	2.6
8	All women with multiple pregnancies, including women with previous uterine scars	30/51	2.9%	58.8%	1.7
9	All women with a single pregnancy with a transverse or oblique lie, including women with previous uterine scars	88/88	5%	100%	4.9
10	All women with a single cephalic pregnancy at less than or equal to 36 weeks gestation, including women with previous scars.	35/106	6%	33.0%	2.0

and local clinics in south western Punjab, with all high risk pregnancies referred here.

The clinical significance of each of the groups and the existing scenario at our institution, as analysed in the present study shows:

Group 1: Generally, in all labor and delivery units, this group is the most important group with greatest variation in cesarean section rates between different centres.[13] Also, the CSRs, labor events and outcomes in this group are considered as gold standard measure of effective functioning of labor and delivery units. Increased CSRs in this group is a driving force for increasing primary CSR.[14–16] In the present study, it constituted majority of the patients (20.1%), with the group specific CSR as high as 28.7% and contribution of 5.8% to the overall CSR. This was higher than the study done by Shirsath A[17] (19.6%) and Kansara Vijay[18] (20.11%). Early diagnosis of complications and timely referral from the peripheral hospitals by proper training of grass root workers in labor management protocols can help reduce CSR in this group. Describing strict criteria for diagnosis and management of labor events, diagnosis and treatment of dystocia, use of partogram, implementing correct oxytocin regimen, and fetal monitoring can go a long way to decrease CSRs in this group.

Group 2: In the present study, 15.8% women were grouped here. Out of these, 31.2% had pre-labor cesarean section. The main indications for cesarean sections in this group were eclampsia (12.9%) and antepartum hemorrhage (5.7%). Induction of labor (IOL) was done in 68.8 % patients. Of these, 36.5% had failed induction necessitating cesarean section. The rates of failed induction are quite higher in the present study, as compared to usually ideal expected cesarean section rates for failed induction of 25-30%.[12] Standardization of the indications of labor induction, methods used for labor induction and understanding of labor events and outcomes can help decrease primary cesarean rates in this group. Critical review of induction protocols, limiting IOL for unclear indications and adhering to policy of IOL at 41 completed weeks would have a significant effect on the CSR. Cesarean Delivery at Maternal Request (CDMR) is also quite high in our study (2.9%) owing to higher patient expectations, poor previous pregnancy labour outcomes and more recently maternal choice. This

Table 4: Indications for cesarean delivery in group 1 (single cephalic nulliparous pregnancies at greater than or equal to 37 weeks of gestation in spontaneous labour.)

S No	Cesarean Section Indication	Number (102/355)	% (28.73%)
1	Foetal reasons (no oxytocin)	25/355	7.04%
2	Dyst/IUA/ITT/FI	35/355	9.86 %
3	Dyst/EUA/CPD/POP	20/355	5.63 %
4	Dyst/IUA/ITT/OC	12/355	3.38 %
5	Dyst/IUA/PR	8/355	2.25 %
6	Dyst (No oxytocin)	2/355	0.55 %

Dyst, dystocia; IUA, inefficient uterine action; ITT, inability to treat; FI, fetal intolerance; OC, over contracting; PR, poor response; EUA, efficient uterine action; CPD, cephalopelvic disproportion; POP, persistent occipito posterior position.

Table 5a: Indications for induction of labour in group 2a (single cephalic nulliparous pregnancies at greater than or equal to 37 weeks of gestation), 10 Group Classification System.

S No	Indication for induction of labor	No. (192/279)	% (68.8 %)
1	Pre- eclampsia /eclampsia	67/279	24.0 %
2	Post dated pregnancy	41/279	14.7 %
3	Spontaneous Rupture of Membranes	28/279	10.0 %
4	Fetal reasons	37/279	13.3 %
5	Maternal reasons	19/279	6.8 %

Table 5b: Indications for pre-labour cesarean delivery in group 2b (single cephalic nulliparous pregnancies at greater than or equal to 37 weeks of gestation), 10 Group Classification System.

S No		No. (87/279)	% (31.2 %)
1	APH-placenta previa /abruption	16/279	5.7 %
2	Eclampsia	36/279	12.9 %
3	Maternal medical reasons	13/279	4.7 %
4	Foetal reasons	14/279	5.0 %
5	CDMR	8/279	2.9 %

APH-Antepartum Haemorrhage; CDMR- Cesarean Delivery on Maternal Request.

Table 6: Indications for cesarean section in RTGC group 5.

S No	Indication for LSCS	Number (187)	% (100 %)
1	APH – Placenta previa / Placental abruption / Morbid adherent placenta	24	12.8%
2	CPD	13	7 %
3	Fetal distress	8	4.3%
4	Declined TOLAC	14	7.5%
5	Previous 2 LSCS	13	7%
6	Previous 3 LSCS	7	3.7%
7	Scar Tenderness /dehiscence	98	52.4%
8	Poor Bishop's score (unfavourable cervix)	10	5.3 %

is becoming an important cause of increase in CSRs all over the world. NICE Guidelines recommend facilitation of elective cesarean section on maternal request,[19] reflecting a radical shift in modern obstetric care, leaving the responsibility and accountability on women's shoulders to avoid medical litigation, but this is causing increase in CSRs.

Group 3: Ideally, it should have very low CSRs (<3 %) and should be similar in every delivery and labour unit[13] so much so that higher CSR in this group suggests poor data collection or improper patient classification. In the present study this group contributed to 1.1% to overall CSR. In our study the CS rate in group 3 was 6% which again was in accordance with the studies by Shirsath A[17] (4.8%) and Kansara Vijay[18] (5.4%).

Group 4: It contributed 1.2% to the overall CSRs in our study. As against the ideal expected CSR in this group between 5-8 %,[13] we found 11.2 % group CSR.

Group 5: It is the largest contributor to CSRs in every labour and delivery unit. The high rates can be attributed to the fact that in our institution TOLAC is not usually encouraged for fear of risk of uterine rupture. Criteria for TOLAC has never being straight forward and tends to be at the discretion of individual obstetrician. A number of studies have shown VBAC success rates of ≥50% without increasing perinatal and maternal morbidity.[20] With good perinatal outcomes, a CSR of 50-60% in Group 5 is excellent. In our study the CSR in group 5 was 85.4% which is in accordance with those observations by Shirsath A[17] (87.2%) and lower than by Kansara Vijay[18] (98.3%).

Group 6 & Group 7: Most nulliparous breech pregnancies are delivered nowadays by cesarean section whereas this is not true for multiparous women with breech pregnancy. The relative size of group 7 (3.4 %) is smaller than group 6 (5 %), therefore the contribution to cesarean section rates is even smaller (3.9 % in Group 6 & 2.6 % in Group 7). Reluctance to offer External Cephalic Version (ECV) despite clear protocols leads to increased CSR in this group.

Group 8: Generally, the size of group 8 is smaller than group 6 and 7. The same is true for present study (2.9 %). This group has significantly higher perinatal morbidity and mortality rates as compared to other groups. Though the group cesarean section rates in this group were high (58.8 %), its contribution to overall cesarean section rates is very low (1.7 %) owing to relative small size of this group.

Group 9: The ideal expected cesarean section rates in this group is always 100% (also true for present study).

Group 10: Size of this group is usually 4-5 %, but may be as high as 10%. In our study the size of this group is 6 %. This may be attributed to the fact that higher proportions of pre-term delivery patients being referred here in view of NICU facilities being available here. In the present study, the CSR in this group is 33%(more than the ideal expected rate of < 30%). This can be attributed to the fact that the significant proportion of pre-term delivery was due to fetal and/or maternal conditions and not due to pre-term spontaneous labour.

Conclusion

Overall, it needs to be understood that CSRs, whether high or low, are not a marker of quality care on their own. Analysing CSRs using the TGCS classification, however, is a marker of quality care at labour and delivery units as it assesses the maternity care based on epidemiological information, maternal and fetal events and outcomes. This classification highlights important deficiencies and lack of standardisation in labor and labor and delivery units. The first four groups of TGCS constitute majority of all deliveries in all labour and delivery units. Any increase in CSR in these groups leads to increase in primary CSRs. This classification also identifies low risk groups where we can find inappropriate indications for cesarean sections. It is thus important that efforts to reduce the overall CS rate should focus on reducing the primary CS rates and also encouraging VBAC in patients with previous LSCS.

REFERENCES

1. Ye J, Betrán AP, Vela MG, Souza JP, Zhang J. Searching for the optimal rate of medically necessary cesarean delivery. Birth 2014; 41: 237–244.

2. A. P. Betran, M. R. Torloni, J. Zhang et al., "What is the optimal rate of cesarean section at population level? A systematic review of ecologic studies," *Reproductive Health*, vol. 12, no. 1, article 57, 2015.

3. J. Ye, J. Zhang, R. Mikolajczyk et al., "Association between rates of cesarean section and maternal and neonatal mortality in the 21st century: a worldwide population-based ecological study with longitude data," *BJOG*, vol. 123, no. 5, pp. 745–753, 2016.

4. UNICEF. The State of the World's Children 2013. New York: UNICEF, 2013. http://www.unicef.org/sowc2013/ (accessed March 23, 2015).

5. Souza J, Gülmezoglu A, Lumbiganon P, et al. Cesarean section without medical indications is associated with an increased risk of adverse short-term maternal outcomes: the 2004–2008 WHO Global Survey on Maternal and Perinatal Health. BMC Med 2010; 8:71.

6. Torloni MR, Betrán AP, Souza JP, et al. Classifications for cesarean section: a systematic review. PLoS One 2011; 6: e14566.

7. Robson MS. Classification of cesarean sections. Fetal Matern Med Rev 2001; 12: 23–39.

8. World Health Organization, *WHO Statement on Cesarean Section Rates*, WHO/RHR15.02, World Health Organization, Geneva, Switzerland, 2015.

9. FIGO Working Group on Challenges in Care of Mothers and Infants during Labour and Delivery, "Best practice advice on the 10-Group Classification System for cesarean deliveries," *International Journal of Gynecology & Obstetrics*, vol. 135, no. 2, pp. 232–233, 2016.

10. A. P. Betr´an, N. Vindevoghel, J. P. Souza, A. M. G¨ulmezoglu, and M. R. Torloni, "A systematic review of the Robson classification for Cesarean section: what works, doesn't work and how to improve it," *PLoS ONE*, vol. 9, no. 6, Article ID e97769, 2014.

11. Murphy M, Butler M, Coughlan B, Brennan D, O'Herlihy C, Robson M. Elevated amniotic fluid lactate predicts labour disorders and cesarean delivery in nulliparous women at term. *Am J Obstet Gynecol* 2015.

12. Patel RV, Gosalia EV, KJ, Vasa PB, Pandya VM. Indications and trends of cesarean birth delivery in the current practice scenario. Int J Reprod Contracept Obstet Gynecol. 2014;3:575-80.

13. Brennan DJ, Robson MS, Murphy M, et al. Comparative analysis of international cesarean delivery rates using 10 – group classification identifies significant variation in spontaneous labour. Am J Obstet Gynecol.2009;201:308. e1-8.

14. Brennan DJ, Murphy M, Robson MS, et al. The singleton, cephalic, nulliparous women after 36 weeks if gestation: contribution to overall cesarean delivery rates. Obstet Gynecol.2011;117:273-279.

15. Allen VM, Baskett TF, O'Connell CM. Contribution of select maternal groups to temporal trends in rates of cesarean section. J Obstet Gynaecol Can.2010;32:633-641.

16. Silver RM. Implications of the first cesarean: perinatal and future reproductive health and subsequent cesereans, placentation issues, uterine rupture risk, morbidity, and mortality. YSPER.2012;36:315-323.

17. Kansara V, Patel S, Aanand N, Muchhadia J, Kagathra B, Patel R. A recent way of evaluation of cesarean birth rate by Robson's 10-group system. J Med Pharmaceut Allied Sci. 2014;01:62-70.

18. Shirsath A, Risbud N. Analysis of cesarean section rate according to Robson's 10-group classification system at a tertiary care hospital. Int J Sci Res. 2014 Jan;3(1):401-402.

19. National Institute of Health and Care Excellence 2011. Ceserean Section. CG 132. London: National Institute for Health and Care Excellence; 2011.

20. Tahseen S, Griffiths M. Vaginal birth after 2 cesarean sections (VBAC-2) – a systematic review with meta-analysis of success rate and adverse outcomes of VBAC-2 versus VBAC-1 and repeat (third) cesarean sections. BJOG 2010;117(1):5-19. [http://dx.doi.org/10.1111/j.1471-0528.2009.02351.x]

Original Article: Obstetrics

Maternal and Perinatal Outcome in Women with Cardiac Disease – A Prospective Observational Study in a Tertiary Care Centre

Dr. Sima Biswas,[1] Prof. (Dr) Picklu Chaudhuri[2]

Abstract

Introduction: Heart disease in pregnancy is of great clinical significance and is one of the leading cause of maternal mortality globally due to the increased hemodynamic burden and possibility of exaggeration of underlying disease during pregnancy.

Aims and objective: To evaluate feto-maternal outcome of women with heart disease during the period of July 2014 to June 2015.

Material & Method: All pregnant women with diagnosed heart disease admitted through emergency or outpatients department in the department of Obstetric and Gynecology, R.G. Kar Medical College from July 2014 to June 2015 were included in this study.

Results: Out of total of 50 cases studied, 37 (74%) women had rheumatic and 13 (26%) had congenital heart disease. Majority had NYHA grade I and had grade II disease (66%). There was one maternal death due to heart failure. There was high incidence of low birth weight in 22 cases (44%) and prematurity in 18 cases (36%) among the newborns.

Conclusion: Feto-maternal outcome can be improved appreciably by antenatal care, early diagnosis and management.

Introduction

Cardiac disease during pregnancy is still a major problem especially in poor resource countries. Cardiovascular disease complicates around 1-3% of all pregnancy and responsible for 10-15% of maternal death.[1] Although prevalence is low but now a days it is the leading cause of maternal death internationally. Since more women with congenital or acquired heart diseases are reaching child bearing age due to improved medical and surgical care, the incidence of cardiovascular disease in pregnancy is increasing. There is marked hemodynamic changes during pregnancy. The pregnant women are in a hyper-dynamic and volume-overloaded state as a result of physiological changes. These changes result

1. Clinical Tutor, Department of Gynecology & Obstetrics, Rampurhat Government Medical College & Hospital
2. Professor, Department of Gynecology & Obstetrics, Rampurhat Government Medical College & Hospital

Corresponding author: Prof. (Dr) Picklu Chaudhuri.
Email: picklu.chaudhuri@gmail.com

in increased demand on the cardiovascular system. In normal women the cardiac reserve is sufficient to accommodate this increased work load. However, women with underlying heart disease cannot tolerate these additional hemodynamic burden of pregnancy. So, there may be significant risk to the mother, fetus or both. Therefore, pregnancy may exaggerate underlying disease, resulting in increased morbidity and mortality. Despite advancement in medical care, heart disease in pregnancy is associated with high maternal and perinatal morbidity and mortality particularly in developing countries. This study was done to enlighten the outcome of heart disease on pregnancy in term of maternal and perinatal morbidity and mortality as there were few studies in India done regarding cardiac disease in pregnancy.

Materials & Method

Fifty cases were studied in this prospective observational study, conducted in all pregnant woman with diagnosed heart disease admitted through OPD & emergency in the Dept. of Obstetrics & Gynecology, RG Kar Medical College from July 2014 to June 2015.

Women with coronary cardiac disease and with medical disorder other than cardiac disease were excluded from this study. After taking Ethical permission, written inform consent was taken. Case History was with special emphasis on the symptoms and treatment undertaken. General, obstetrical, cardiovascular and respiratory system examination was done properly. All the routine antenatal investigation along with ECG and echocardiography was done.

Women were evaluated by New York Heart Association functional grading. All cases were referred to the cardiologist after admission and managed by joint supervision of the obstetrician and cardiologist throughout the pregnancy and puerperium. The records related to maternal complication during antenatal, intranatal and postnatal period were obtained. The labor and delivery events were also recorded. Neonatal parameters in terms of birth weight, Apgar score, need for NICU admission and neonatal death were also recorded. During discharge all patients were advised to come OPD 6 weeks after delivery for follow up.

Results

Fifty pregnant women with diagnosed heart disease were studied. The baseline characteristic of women is shown in table 1. Majority of cases (25 /50, 50%) were of age group 25-29 years and were primigravida (27/50, 54%), from rural area (43 /50, 86%) and from lower socio economic background (20/50, 40% cases were of below poverty line).

Most of them were admitted in between 33 and 36 weeks of gestation (27/50, 54%).

Table 1: DEMOGRAPHIC characteristic

	Number	Percentage
Age Distribution (in years)		
20 years	4	8%
20-24 years	17	34%
25-29	25	50%
>30	8	16%
Gravida Distribution		
G1	27	54%
G2	11	22%
G3	5	10%
G4	7	14%
Rural Urban Distribution		
Rural	43	86%
Urban	7	14%
Socio-economic status		
Middle class	12	24%
Lower class	18	36%
Below poverty line	20	40%
Booked unbooked Status		
Booked	36	72%
Unbooked	14	28%
Gestational age in weeks at admission		
28-32	8	16%
33-36	27	54%
>36	15	30%

Regarding type of heart disease, 37 (74%) had rheumatic heart disease and 13 (26%) had congenital heart disease (Table 2). Among rheumatic heart disease mitral stenosis was the most common lesion (10/50, 20%). Multiple vulvular lesion were found in 24 (48%) cases. Among Congenital heart disease, Atrial septal defect was the most common type (8/50,16%). Majority were of NYHA class II (20/50, 40%).

Table 2: Type of heart disease

	Number	Percentage
Rheumatic	37	74%
MS	10	20%
MR	3	6%
MS+MR	7	14%
AS	1	2%
AR	1	2%
TR	1	2%
MS+PAH	5	10%
MS+MR+PAH	6	12%
MR+AR+PAH	2	4%
MS+MR+AS+PAH	1	2%
Congenital	13	26%
ASD	6	12%
ASD+PAH	2	4%
VSD	2	4%
VSD+PAH	1	2%
PDA	1	2%
TOF	1	2%
NYHA functional Classification		
I	13	26%
II	20	40%
III	10	20%
IV	7	14%

Spontaneous vaginal delivery occurred in 24 (48%) cases, instrumental vaginal delivery was needed for 7 (14%) cases and LSCS was done for obstetric and fetal reason in 19 cases (38% Complication during hospital stay was shown in table 3. The common complications and co morbid conditions were Congestive cardiac failure (9/50, 18%), pulmonary arterial hypertension (6/50,12%), atrial fibrillation (5/50, 10%), pulmonary edema (4/50,8%), pre-eclampsia (2/50,4%), anemia (23/50, 46%), respiratory tract infection (6/50,12%). One maternal death occurred due to cardiac failure in immediate post-partum period. The case was unbooked with severe MS+MR+AR+PAH, (NYHA grade IV heart disease).

Incidence of low birth weight was high (22/50, 44%) among the newborns and the need for NICU admission was also high (18/50, 36%). A still born baby of low birth weight (1.20 kg) was delivered by mother with grade IV heart disease. Among neonatal deaths, one death occurred due to prematurity, delivered by a woman with grade III heart disease at 34 weeks. Another death occurred due to congenital heart disease in the newborn. Out of 13 women (26%) with congenital heart disease, only one baby was born with congenital heart disease.

Table 3: Maternal & Neonatal outcome

	Number	Percentage
Maternal cardiac events		
Congestive heart failure	9	18%
Pulmonary atrial hypertension	6	12%
Pulmonary Edema	4	8%
Atrial fibrillation	5	10%
Bacterial endocarditis	0	0%
Maternal death due to cardiac failure	1	2%
Non-Cardiac Events		
Respiratory infection	6	12%
Anemia	23	46%
Pre-eclampsia	2	4%
Diabetes	0	0%
Mode of Delivery		
Spontaneous vaginal delivery	24	48%
Instrumental vaginal delivery	7	14%
LSCS	19	38%
Neonatal outcome		
Birth weight		
<1.5 kg	1	2%
1.5-2.5 kg	21	42%
> 2.5 kg	28	56%
Admission in neonatal care unit	18	36%
Birth Asphyxia	2	4%
Prematurity	18	36%
Neonatal sepsis	2	4%
ARDS	4	8%
Still born	1	2%
Neonatal Death	2	4%

* Some patient had more than one complication.

Discussion

With the advancement of modern technique and knowledge, the hemodynamic circulation in pregnancy was better understood. The management of pregnancy with heart disease therefore has become much easier and methodical than it was years ago. The cooperation of other specialist and the discovery of modern drug, improvement of socioeconomic status, the maternal as well as fetal mortality and morbidity have reduced.

In this prospective observational study 50 pregnant mothers with heart disease were studied. All type of lesion, booked and unbooked patients were included.

Majority of cases (84%) pregnancy with heart disease was found in age group of 20-29 years.. Most of patient (54%) were primigravida. Similar age and gravidity characteristic were shown by T. Nquayana et al.[2] and H. Konar et al.[3] In this study most of the patient (86%) come from rural area, 72% cases were booked and 40% belonged to the B.P.L group. Unbooked patients were mainly referred from different health centre. This result was similar to study done Konar et al[3] (61% cases were booked) and a descriptive case series study[4] at Karachi by Ahmed (41% case were booked).

40% of the study population were NYHA class II, 26% were class I, 20% were class III and 14% were class IV (Table-3). Most of class I & II were booked cases received proper antenatal checkup and admitted near term where as III & IV were unbooked and admitted mainly as emergency cases. All women of grade I and 95% of women with grade II had term delivery whereas only 50% of women with grade III disease had term delivery. Abdel-Hady E.S,[5] in his series found 70 % women had NYHA class I & II while in the series by McFaul P[6] et al. the same was 86%. Study by H. Sawhney et al.[7] had similar observations (class I & II- 66%, class III & IV-34%).

In the present study 74%of the cohort had Rheumatic heart disease and 26% had Congenital heart disease. Rheumatic to congenital heart disease ratio 2.84:1. Among rheumatic heart disease most common (20%) was MS and ASD was the commonest congenital lesion (12%) This observation was identical to study by Doshi et al[8] (68.6% Rheumatic heart disease with mitral valve involvement in 88.5% cases and 1.5% congenital heart disease with septal defect predominance). Asghar et al[9] reported congenital heart disease in 14% cases and Rheumatic heart disease in 66% cases and mitral stenosis was dominant lesion. Konar et al[3] also showed 69% rheumatic heart disease in his series with mitral stenosis (26.7%) being the commonest lesion. Whereas 21.3% cases had congenital heart disease and septal defect was predominant lesion in 9.6% cases..

Patients presented with various complains - dyspnea was the most common (82%) followed by palpitation (30%) and Cough (12%). In the present study series 18% developed Congestive Cardiac failure, 12% had PAH and 10% were complicated by Atrial Fibrillation.

Retrospective study by Liu et al.[10] reported cardiac failure in 8.5% cases while. McFaul et al[6] observed heart failure in 18% of cases. Silversides CK et al.[11] found pulmonary edema in 31% cases and atrial fibrillation in 17% women. Complication varied among the studies due to variation in the grade of disease, type of lesion, timing of diagnosis and intervention.

The maternal mortality in our series was low as majority of cases were grade 1 and 2. Similar low maternal death was reported by Ahmed[4] et al. (2.1%).

Higher maternal mortality was recorded by Schoon MG et al[12] (9.5%) possibly because of higher grade of disease at the time of diagnosis.

Regarding mode of delivery, the present study observed 40% vaginal delivery, 14% instrumental vaginal birth and 38% cesarean delivery. Similar incidence of LSCS was reported by by Siu et al[13] (27%) and Bonow R.O et al[14] (29.9%).

During analysis of birth weight of baby, 44% were low birth weight and among them 2% were of very low birth weight (1.5 kg). Ahmed et al[4] reported low birth weight in 27.7% cases which was lower than that of the present study.

Maximum low birth weight babies born to mother with functional class III and IV and this was supported by study of Abdel-Hedy.[5] We observed birth asphyxia in 4%, prematurity in 36%, ARDS in 8%, Neonatal sepsis in 4% of newborns. Two (4%) neonatal death occurred, one due to congenital heart disease (VSD) delivered by mother with grade II heart disease with ASD, another death due to prematurity delivered at 34 weeks by mother with grade III heart disease.

Similar observations were recorded by Konar et al3 (low birth weight in 41.3%, perinatal mortality 4%) and Siu et al[13] (preterm 12.68%, ARDS 5.76%) and Liu et al[10] (perinatal death 1.1%).

Conclusion

Heart disease with pregnancy is one of the important causes of maternal death. Rheumatic heart disease is the commonest heart disease in resource poor countries. Improvement of standard of living can reduce the incidence of rheumatic fever which in turn capable of lowering RHD. Routine auscultation of cardio-vascular system in early pregnancy check

up is essential to suspect the abnormal heart lesion so that the women can be referred to cardiologist for details evaluation, and the diagnosis of heart disease may be possible at early stage of pregnancy which is lifesaving. So, to reduce morbidity and mortality due to heart disease obstetrician should practice routine auscultation of cardiovascular system during first antenatal checkup. Multidisciplinary care of the women with cardiac disease is also mandatory in order to reduce maternal and perinatal mortality and morbidity.

REFERENCES

1. Klein LL, Galan HL. Cardiac disease in pregnancy. *Obstet Gynecol Clin N Am* 2004; 31: 429–459.
2. Nqayana T, Moodley J, Naidoo DP. Cardiac disease in pregnancy. *Cardiovasc J Afr.* 2008;19(3):145–151.
3. Konar Hiralal, Chaudhuri Snehamay. Pregnancy Complicated by Maternal Heart Disease: A Review of 281 Women. The Journal of Obstetrics and Gynecology of India (May–June 2012) 62(3):301–306.
4. Ahmed N, Kausar H, Ali L, Fetomaternal outcome of pregnancy with Mitral stenosis. Pak J Med Sci. 2015;31(3):643-675.
5. Abdel-Hady ES, El-Shamy M, El-Rifai AA, Goda H, Abdel-Samad A, Moussa S. Maternal and perinatal outcome of pregnancies complicated by cardiac disease. Int J Gynecol Obstet. 2005;90(1):2.
6. McFaul P, Dornan J, Lamki H, et al. Pregnancy complicated by maternal heart disease. A review of 519 women. Br J Obstet Gynaecol. 1998;95:861–867.
7. H. Sawhney, N. Aggarwal et al. Maternal and perinatal outcome in rheumatic heart disease, International journal of Gynecology and Obstetrics January 2003 Volume 80, Issue 1, Pages 9–14.
8. Doshi HU1, Oza HV, Tekani H, Modi K. Cardiac disease in pregnancy-maternal and perinatal outcome. J Indian Med Assoc. 2010 May;108(5):278-280.
9. Asghar F, Kokab H. Evaluation and Outcome of Pregnancy Complicated by Heart Disease. J Pak Med Assoc. 2005;55(10):416–419.
10. Liu H1, Xu JW, Zhao XD, Ye TY, Lin JH, Lin QD. Pregnancy outcomes in women with heart disease. Chin Med J (Engl). 2010 Sep;123(17):2324-2330.
11. Silversides CK. Colman JM, Sermer M, Siu SC. Cardiac risk in pregnant women with rheumatic mitral stenosis. Am J Cardiol 2003; 91:1382–1385.
12. Schoon MG, Bam RS, et al. Cardiac disease during preg - A free state perspective on maternal morbidity & mortality. S African Med J.1997;87(Suppl 1); C19-C22.
13. Siu SC, Sermer M, Harrison DA, Grigoriadi. Risk and predictors for pregnancy-related Complications in women with heart disease, Circulation. 1997 Nov 4;96(9):2789-2794.
14. Bonow RO, Carabello BA, deLeon AC, et al. ACC/AHA guidelines for the management of patients with valvular heart disease: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Committee on management of patients with valvular heart disease). J Am Coll Cardiol 1998; 32:1486–1588.

Clinical Research Article - Obstetrics

Placenta Accreta Spectrum: A Clinical Review

Archana Kumari,[1] M Vahini,[2] Meenal Singh[3]

Abstract

Objectives: To determine the incidence, risk factors, diagnosis, management options and outcome of placenta accreta spectrum.

Methods: Retrospective observational study over a period of 2 years. Cases with adherent placenta found during caesarean deliveries and post vaginal deliveries during manual removal were reviewed through case records.

Results: The incidence of placenta accreta spectrum was 0.31%. Out of the 43 cases that fulfilled the inclusion criteria of placenta accreta spectrum, 36 cases were observed during caesarean and 7 cases post vaginal delivery. Placenta increta was commonest (46.5%) in the spectrum followed by placenta accreta (37.2%) and placenta percreta (16.2%). Most important risk factor was previous cesarean deliveries (70%) and placenta previa (48.8%). Majority of women (72%) required hysterectomy. Conservative management with placental retention was done in 6 cases, with methotrexate in one. Maternal mortality was 4.6%.

Conclusion: It is important to anticipate placenta accreta in women with previous cesarean delivery and placenta previa. Womenwith risk factors for placenta accreta should have an ultrasound by experienced provider and should be counselled about potential sequele and need for delivery at a tertiary centre. An emergency or planned hysterectomy with multidisciplinary approach reduces maternal morbidity and mortality.

Introduction

The term 'placenta accreta' has been used to describe a single pathological entity, as well as a generic term for the disease spectrum. Used singly placenta accreta occurs, if placenta attaches to but does not invade into myometrium. The disease spectrum includes three categories- placenta accreta, increta and percreta. If placenta invades into myometrium and not beyond, the term placenta increta is employed. When placenta invades through the serosal layer and potentially beyond, the term percreta is employed.[1] In this spectrum placenta accreta is most common and placenta percreta is least common.[2]

The abnormal adherence of placenta has important clinical implications which can result in severe maternal and neonatal morbidity and mortality. This typically occurs when the placenta fails to separate from the uterus following delivery of the baby,

1. Associate Professor, Department of Obstetrics and Gynecology, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand.
2. Junior Resident, Department of Obstetrics and Gynecology, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand.
3. Consultant Radiologist, Health Map Diagnostic Center, RIMS, Ranchi.

Corresponding author: Dr. Archana Kumari.
E-mail dr_karchana@yahoo.co.in

leading to massive hemorrhage and other associated complications like disseminated intravascular coagulation (DIC), multiorgan dysfunction, need for emergency hysteterctomy and even death.[3] Fetal morbidity and mortality is related to complications of premature birth.[4]

Placenta accreta, once a rare occurrence is now becoming an increasingly common complication of pregnancy mainly due to increasing rate of cesarean deliveries. With increased recognition of risk factors and availability of ultrasonography, many cases of placenta accreta spectrum disorders can be identified antenatally. However not all population, especially from low resource countries like ours have access to qualified and experienced radiologists. Due to these factors, placenta spectrum (PAS) disorders are often diagnosed only at the time of delivery. It is therefore important that, obstetricians working at all levels, should be familiar with the risk factors, proper diagnosis and management of these disorders. With this background, the present study was done to determine the incidence, risk factors, diagnosis, management options and fetomaternal outcome of PAS.

Methods

This is a retrospective observational study conducted in the Department of Obstetrics and Gynecology of Rajendra Institute of Medical Sciences (RIMS), Ranchi between July 2016 and June 2018 over a period of 2 years.

Inclusion criteria for placenta accreta spectrum was one of the following:

1. Suspected or diagnosed cases of placenta accreta based on ultrasound and /or MRI

2. Cases of placenta accreta spectrum found during cesarean delivery, including percreta, increta, as well as cases of accreta where forced or piecemeal removal of placenta resulted in heavy bleeding from the implantation site.

3. Cases requiring manual removal of placenta (MROP) after vaginal delivery, when placental removal could not be done partially or totally due to absence of cleavage plane between placenta and uterus. We excluded the cases of MROP after vaginal delivery where placenta could be completely removed.

Case records were reviewed for demographic details like age, parity, period of gestation, risk factors like placenta previa, previous caesarean and history of other uterine surgeries, ultrasound findings about placenta, operative notes about degree of PAS- accreta, increta, and percreta, operative procedures done, requirement of blood transfusion and postoperative events. Neonatal outcomes were reviewed from birth weight, NICU admission, and perinatal mortality.

Results

During the study period, total 43 cases fulfilled the inclusion criteria and total deliveries in our institution during same period was 13,511 (vaginal deliveries - 7,555 and cesarean - 5,956). The incidence of placenta accreta spectrum in our study isthus 0.31% (1 in 322.5 deliveries).

Table 1: Demographic characteristics (n=43)

Age	Number (%)
18-24 yrs	7 (16.3%)
25-29 yrs	20 (46.5%)
30-34 yrs	11 (25.6%)
≥35 yrs	5 (11.6%)
Parity	
Primigravida	4 (9.3%)
2nd gravida	16 (37.2%)
3rd gravida	12 (27.9%)
4th gravida	6 (13.9%)
5th or more gravida	5 (11.6%)
Booking status	
Booked	13 (30.2%)
Referred	30 (69.8%)
Socioeconomic status	
Rural	17(39.5%)
Urban	26 (60.5%)

Table 1 shows demographic profile of women. Majority (46.5%) belonged to 25-29 years age group. Five women were above 35 years. Most (65%) were 2nd or 3rd gravida, four were primigravida, and five were grandmultipara. Only 13 women (30.2%) were booked cases, rest 30 (69.8%) were referred cases. About 40% women had rural background and 60% had urban background.

Table 2 depicts the associated risk factors. About 70% (30/43) women had previous cesarean. Placenta previa was associated in 21 (48.8%). Previous cesarean with previa was associated in 19 (44%) women. Ten

(23.2%) had prior uterine curettage whereas 4 (9.3%) had no risk factors.

Table 2: Risk factors for PAS

Risk factors	Number (%)
Previous 1 cesarean	17 (39.5%)
Previous 2 cesarean	12 (28%)
Previous 3 cesarean	1 (2.3%)
Both previous cesarean and placenta previa	19 (44.2%)
Placenta previa	21 (48.8%)
Prior uterine curettage	10 (23.2%)
No risk factors	4 (9.3%)

Diagnosis of placenta accreta spectrum was suspected or confirmed by antenatal ultrasonography in 13 (30.2%) cases, whereas majority (53.4%) were diagnosed intraoperatively during cesarean section. Seven cases were diagnosed after vaginal delivery, when manual removal of placenta was not possible totally or partially due to absence of proper cleavage plane between placenta and uterus. (Table 3)

Table 3: Diagnosis of PAS

Mode of Diagnosis	Number (%)
Ultrasonography	13 (30.2%)
Intraoperative during cesarean	23 (53.4%)
Post vaginal delivery	7 (16.2%)

Table 4: Gestational age at time of delivery

Gestational age	Number (%)
18 weeks	1 (2.3%)
28 w 0 d – 31 w 6 d	3 (7.1%)
32 w 0 d – 36 w 6 d	16 (37.2%)
37 w 0 d – 40 w 0 d	21 (48.8%)
≥ 40 w 1 d	2 (4.6%)

Table 4 shows that 48.8% (21/43) had term delivery between 37-40 weeks. All seven cases of retained placenta diagnosed postvaginal delivery were term deliveries. 37.2% had preterm cesarean between 32-36 weeks. Three were operated very prematurely due to massive APH, one case had hematuria too. Only seven booked cases had planned cesarean, rest all were operated on emergency basis. One case (G3, previous 2 cesarean) who had hysterotomy at district hospital for 2nd trimester MTP, was referred to us after intraoperative diagnosis of placenta increta at 18 weeks.

Table 5 and figure 1 shows distribution of PAS disorders. Placenta increta was most common in 20 (46.5%), followed by accretain 16 (37.2%), and percreta in 7 (16.2%).

Table 5: Types of PAS

Types of PAS	During Caesarean section (n=36)	Following vaginal delivery (n=7)
Placenta accreta	11 (30.5%)	5 (71.4%)
Placenta increta	18 (50%)	2 (28.6%)
Placenta percreta	7 (19.4%)	

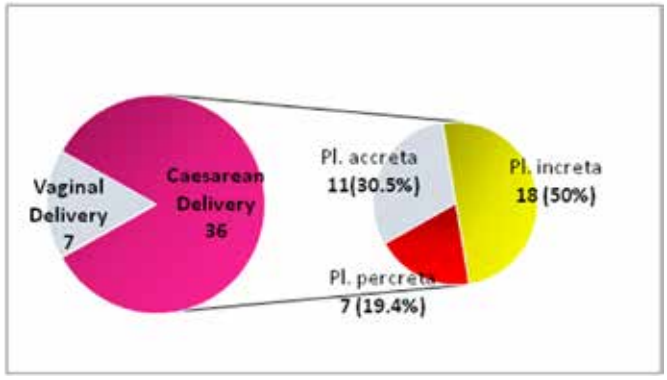


Fig. 1: Types of PAS during cesarean and vaginal delivery

Table 6: Management/ Intraoperative procedures

Interventions	Number (%)
Subtotal hysterectomy	17 (39.5%)
Total hysterectomy*	14 (32.5%)
Hemostatic sutures in placental bed	6 (14%)
Conservative management with placental retention	5 (11.6%)
Methotrexate	1(2.3%)
Bladder repair / partial cystectomy#	5(11.6%)

*Hysterectomy was done during relaparotomy in one case
Done in addition to hysterectomy

Table 6 summarises the therapeutic interventions. About 70% (31/43) had hysterectomy (14 total hysterectomy and 17 subtotal hysterectomy). Three women with percreta had placenta extending beyond the lower segment into the bladder, so partial cystectomy with repair of bladder done in addition to hysterectomy. Two women (both previous section with previa) required bladder repair for accidental injury to bladder during hysterectomy. In one referred case following hysterotomy, as mentioned in above paragraph, relaparotomy with total hysterectomy was done for massive atonic PPH. Out of the 7 cases diagnosed post vaginal delivery while performing MROP, five had focal areas of morbid adherence, partial removal could be done and adherent bits of placenta were left in situ as there was no bleeding. These women were advised serial monitoring with serum β-HCG and ultrasound, but were lost to follow

up. Other 2 women had massive hemorrhage while attempting MROP, so total abdominal hysterectomy was done, intraoperatively, both of them had placenta increta. One case of intraoperatively diagnosed placenta increta left in situ during cesarean at district hospital referred to us on day 5 of puerperium, was managed conservatively with methotrexate injection.

Table 6: Management/ Intraoperative procedures

Maternal morbidity	Number (%)
Massive hemorrhage	26 (60.4%)
Hypovolemic shock	14 (32.5%)
Blood transfusion (≥3 units, FFP)	31 (72.0%)
DIC	4 (9.3%)
Bladder injury/partial cystectomy	5 (11.6%)
Postoperative wound infection	9 (20.9%)
Maternal mortality	2 (4.6%)

Table 7 describes maternal outcome. Massive hemorrhage was prominent feature in most cases requiring blood transfusion of more than 3 units with FFP and platelets in about 72%. Four women developed DIC, of whom two died. Maternal mortality in our series was thus 4.6% (2/43). The main neonatal complication was prematurity (44%). There were 2 intrauterine death at term, 10 early neonatal deaths due to prematurity. Perinatal mortality was 28.5%. The mean birth weight was 2 kg.

Discussion

The incidence of PAS in our study is relatively high 0.31%, compared to other studies, 0.04% reported by Agarwal et al and 0.03% reported by Desai et al in other studies.[5,6] This may be due to fact that our institution is tertiary referral centre catering to high risk obstetric cases of whole of Jharkhand state. The incidence of placenta accreta in literature varies between 0.001 and 0.9% of deliveries, a rate that depends upon definitions adopted for accreta (clinical or histological diagnosis) and the population studied; and has increased dramatically over last three decades parallel to increase in cesarean delivery rates.[7,8]

Previous cesarean section is the most significant associated risk factor (70%) followed by previa (48%) in our study, similar to other studies.[5,6] The association between increasing number of cesarean deliveries and risk of placenta accreta, might be due to malrepair of endometrium and/or decidua basalis. With the subsequent pregnancy, cytotrophoblasts invade decidualised endometrium, but fail to encounter the Nitabuch's layer (spongiosus layer of decidua) and do not encounter the normal signal to stop invasion and hence continue invasion to an abnormal degree.[9] Relative hypoxia of caesarean scar tissue resulting from fibroblast-based repair and decreased vessel concentration may recruit preferentially the blastocyst to implant in these areas resulting in increased risk of accreta.[10] History of uterine curettage, myomectomy, hysteroscopic surgery are also associated risk factors.[11] Advanced maternal age and increasing parity have been reported as risk factors.[12] Age ≥ 35 years and grand multiparity was noted in 5 cases each (11.6%) in present study.

Diagnosis of placenta accreta was made by antenatal ultrasound in 13 (30.2%) cases (9 booked and 4 referred cases). In 4 booked cases, diagnosis was missed even by ultrasound. Most of the times, diagnosis was made intraoperatively. Almost all referred cases had one ultrasound done in 2nd or 3rd trimester, still the diagnosis of placenta accreta was missed. A series conducted in an accreta referral center showed sensitivity of ultrasound to be closer to 55% and specificity 88%, overall accuracy of only 65%.[13] Ultrasonographic quality, skill and clinical experience of the provider are important contributors of accuracy for diagnosis. USG diagnosis is made by presence of lacunae (irregularly shaped vascular spaces) which give the placenta "Swiss cheese appearance", loss of retroplacental-myometrial zone and turbulent flow in Doppler velocimetry. In case of previa, there should be distinct intervening echolucent zone between placenta and bladder. If there is loss or disruption of myometrial continuity, accreta should be suspected. MRI is more useful in diagnosis of cases of posterior previas and in suspected percreta.

Earliest gestational age in placenta accreta that has been diagnosed by ultrasound is 8 to 9 weeks in case of scar pregnancy.[5,14] In our study, 18 weeks was earliest gestational age of diagnosis that was accidental intraoperative diagnosis during hysterotomy. 43% of cases had preterm deliveries and 48% had term delivery. In booked cases, we planned cesarean between 34 and 36 weeks. But as most were unbooked cases, they were referred with antepartum hemorrhage near term.

In our study, placenta increta was most common type (46.5%) among the spectrum of placenta accreta

disorders followed by accreta (37.2%) and percreta (16.2%). This is in contrast to that reported in literature, accreta being most common (75-78%), increta (17%) and percreta (5-7%) of all women.[15]

Although hysterectomy is the "generally accepted" treatment of placenta accreta, several cases have been managed conservatively.[16] Strategies include leaving placenta in situ, oversewing of the placental vascular bed, uterine compression sutures, methotrexate, hysteroscopic resection of retained placental tissue, uterine vessel embolization, delayed hysterectomy after 6 weeks. Conservative management has the benefits of decreased blood loss, fertility preservation and decreased morbidity.[17] Majority (72%) in our study underwent hysterectomy, as about 46% had increta and 16% had percreta. Five cases were managed conservatively with placental bits left in situ but were lost in follow up. One woman was given methotrexate in the postpartum period. Methotrexate, a folate antagonist, acts primarily against rapidly dividing trophoblastic cells. It is therefore argued, that as placenta is no longer dividing, methotrexate is of no value. Methotrexate is used in various doses and routes, however there are no randomized trials and no standard protocols regarding its dosage.[18] We used 5 doses of methotrexate injection (1 mg/kg) given on alternate day with folinic acid. The patient is in regular follow up with serial ultrasound showing progressive degeneration of placenta, but is amenorrhoeic since last 1 year.

The maternal morbidity in our study is mainly related to extensive surgery and includes massive hemorrhage, massive blood transfusion, DIC, bladder injury and wound infections. Maternal mortality in our study is relatively low with 2 cases (4.6%), compared to 30% and 18% reported in other studies.[5,19] One was referred in an exsanguinated state following hysterotomy and died despite hysterectomyon relaparotomy and massive blood transfusion. The other mortality occurred in unbooked case of previous two cesarean with previa, when diagnosis of percreta was made intraoperatively during surgery by senior resident. Woman succumbed to death despite hysterectomy and massive blood transfusion. All other cases of percreta surgery was done by senior doctors. Bladder injury rate was 11.6% in our study which is relatively lower than 20% and 18% reported in other studies.[5,19] Injury to bladder occurred owing to poor visualisation and poor dissection planes apart from placental invasion. Cystotomy is one of the most common surgical complication in the management of placenta accreta spectrum disorders.

Conclusion:

With increase in caesarean rates, placenta accreta spectrum disorders have also increased and have become important cause of maternal and fetal morbidity and mortality. PAS should always be anticipated in women with multiple cesareans or previous cesarean with previa. Women with risk factors for PAS, should have ultrasound by experienced provider and should be counselled for delivery at tertiary centres with multidisciplinary team for management and facilities for massive blood transfusion. Unfortunately, placenta accreta is not always suspected or diagnosed before the intrapartum period. After vaginal delivery, inability to remove placenta manually or increased bleeding should raise the suspicion of undiagnosed placenta accreta. Diagnosis at cesarean is easier in that invasion is visualized more easily and directly. Regardless of intraoperative diagnosis, emergency cesarean hysterectomy without attempt to remove placenta by an experienced obstetrician with multidisciplinary approach involving activation of blood bank and anesthesia team helps in reducing morbidity and mortality. Timely referral to tertiary centre is equally important in reducing morbidity and mortality.

REFERENCES

1. Garmi G, Salim R. Epidemiology, etiology, diagnosis, and management of placenta accreta. ObstetGynecol Int 2012;2012(8);873929.
2. Silver RM, Barbour KD. Placenta accreta spectrum: accreta, percreta, and increta. Obstet Gynecol Clin N Am 2015;42:381-402.
3. Upson K, Silver RM, Greene R, et al. Placenta accreta and maternal mortality in the the Republic of Ireland, 2005-2010. J Maternfetal Neonatal Med 2014;27(1):24-29.
4. Vinogard A, Wainstock T, Mazor M, et al. Placenta accreta is an independent risk factor for late preterm birth and perinatal mortality. J Maternfetal Neonatal Med 2014:1-7.

5. Aggarwal R, Suneja A, Vaid NB, et al. Morbidly adherent placenta: a critical review. J Obstet Gynaecol India. 2012;62(1):57–61.
6. Desai R, Jodha B, Garg R. Morbidly adherent placenta and it's maternal and fetal outcome. Int J Reprod Contracept Obstet and Gynecol 2017;6(5):1890-1893.
7. Gielchinsky Y, Rojansky N, FasoulitousSJ, et al. Placenta accreta: summary of 10 years: A survey of 310 cases. Placenta 2002;23:210-214.
8. Klar M, Michels KB. Cesarean section and placental disorders in subsequent pregnancies–a meta-analysis. J Perinat Med 2014;42:571–583.
9. Breen JL, Neubecker R, Gregori CA, et al. Placenta accreta, increta, and percreta. A survey of 40 cases. Obstet Gynecol 1977;49(1):43–47.
10. Jauniaux E, Jurkovic D. Placenta accreta: pathogenesis of a 20th century iatrogenic uterine disease. Placenta 2012;33:244–251.
11. Bowman ZS, Eller A, Bardsley TR, et al. Risk factors for placenta accreta: a large prospective cohort. Am J Perinatol 2014;31(9):799–804.
12. Miller DA, Chollet JA, Goodwin TM. Clinical risk factors for placenta previa–placenta accreta. Am J Obstet Gynecol 1997;177(1):210–214.
13. BowmanZS, EllerAG, KennedyAM, et al. Accuracy of ultrasound for the prediction of placenta accreta. Am J ObstetGynecol 2014;211(2):177.e1–177.e7.
14. ChenYJ, Wang PH, Liu WM, et al. Placenta accreta diagnosed at 9 weeks' gestation. Ultrasound Obstet Gynecol 2002;19:620–622.
15. Jwarah E, Wilkin DJ. Conservative management of placenta accreta. J Obstet Gynaecol 2006;26(4):378–379.
16. KhanM, Sachdeva P, Arora R, et al. Conservative management of morbidly adherent placenta - a case report and review of literature. Placenta 2013;34:963–966.
17. Sentilhes L, Ambroselli C, Kayem G, et al Maternal outcome after conservative treatment of placenta accreta. ObstetGynecol 2010;115(3):526–534.
18. Morken NH, Kahn JA. Placenta accreta and methotrexate treatment. Acta Obstet Gynecol Scand 2006;85(2):248–250.
19. Dwivedi S, Dwivedi GN, Kumar A, Gupta N, Malhotra V, Singh N. Placenta accreta: the silent invader. Int J Reprod Contracept Obstet Gynecol. 2016;5(5):1501-1505

Original Research Article - Obstetrics

Study of Effects of Post Placental Intrauterine Contraceptive Device (IUCD) Insertion during Cesarean Section

Dhruba Prasad Paul,[1] Sharmistha Sarkar,[2] Jayanta Ray[3]

Abstract

Background: Adverse maternal and perinatal outcomes are related to pregnancies spaced too closely together. Present study was to see the effects of post placental IUCD insertion during cesarean section.

Methods: The study was conducted in the Department of Obstetrics and Gynecology, Agartala Government Medical College over 1.5 Years (January 2016-June2017). All cases at term pregnancy delivering by cesarean section were taken for this study. Sample size of 105 was taken. Subjects were recruited from-obstetrics OPD and casualty of Agartala Government Medical College (AGMC) and GB Pant Hospital and evaluated for expulsion and complications. Evaluation is done at the end of six months, one year and one and half year.

Results: Common complications were bleeding per vagina 8 (7.7%) and pain abdomen 8 (7.7%). Expulsion rate was 3.8%. 53 (53%) subjects continued with IUCD. Two cases reported with pregnancy (one intrauterine and another ectopic).

Conclusions: The complications associated with postplacental IUCD insertion is insignificant, still the awareness, acceptance and continuation are very low. Therefore information, education, communication activity by the field workers must be enhanced to overcome this knowledge gap.

Introduction

Adverse maternal and perinatal outcomes are related to pregnancies spaced too closely together. Closely spaced pregnancies is associated with an increased risk of induced abortion, miscarriage, neonatal death, premature birth, placental abruption, low birth weight, congenital disorders, schizophrenia and autism.

Pregnancy interval of five years or more is associated with an increased risk of high blood pressure and signs

1. Assistant Professor, Department of Obstetrics and Gynecology, Agartala Government Medical College and GBP Hospital, Agartala, Tripura
2. Resident, Department of Obstetrics and Gynecology, Agartala Government Medical College and GBP Hospital, Agartala, Tripura
3. Associate Professor, Department of Obstetrics and Gynecology, Agartala Government Medical College and GBP Hospital, Agartala, Tripura

Corresponding author: Sharmistha Sarkar, Resident, Department of Obstetrics and Gynecology, E-mail: drsharmistha01@gmail.com

of damage to another organ system, often the kidneys.[1] Family planning during the first year postpartum has the potential to reduce a significant proportion of these unintended pregnancies as women experience a large UNMET NEED for family planning during this time.2

PPIUCD is employed in this study as a definitive method of post-partum contraceptive device as

- It is safe to use as it is certain that the woman is not pregnant at the time of insertion,
- There is minimal risk of perforation because of thick wall of uterus, there is reduced perception of initial side effects (bleeding and cramping).
- No effect on breastfeeding and Inserting IUCD in the immediate post partum period saves time for both the woman and the provider as the procedure is conducted in the same setting and involves only a few minutes of additional time.[3]

This study has been done to evaluate the complications of post placental IUCD insertion during caesarean section among women delivering in Agartala Government Medical College and at the same time benefit the female population of the state with long acting reversible contraception.

Objective of present study was to evaluate the expulsion rate and complications in post placental IUCD insertion during cesarean section.

Methods

This study was a prospective study conducted in the Department of Obstetrics and Gynecology, Agartala Government Medical College over 1.5 Years (January 2016-June 2017). All cases at term pregnancy delivering by cesarean section were taken. Sample size of 105 was taken. Subjects recruited from - Obstetrics OPD and Casualty of Agartala Government Medical College and GB Pant Hospital.

Exclusion criteria

- Patient with Hb<8 gm%,
- Ruptured membranes >18 hours prior to delivery,
- Chorioamnionitis,
- PPH.

All registered women were first counseled during antenatal period, consent was taken and PPIUCD inserted after removal of placenta and membranes. Thereafter study subjects were asked to follow up at six months, one year and one and half year to evaluate expulsion rate and complications.

Statistical analysis testing was conducted with SPSS 15.0 and Microsoft Excel software.

Results

In this study, stipulated sample size was 105. 130 subjects were counseled. But 105 subjects accepted this method (Table 1).

Table 1: Selection of study subjects

Total counseled (N)	130
Total accepted (N)	105

Table 2: Socio-demographic factors distribution in the study subjects

	N	%
AGE		
<20	12	11.4
21-25	52	49.5
26-30	27	25.7
31-35	10	9.5
>35	4	3.8
PARITY		
1	87	82.9
2	15	14.3
>2	3	2.9
RELIGION		
Hindu	92	87.6
Muslim	4	3.8
Christian	9	8.6
EDUCATION		
No formal education	11	10.5
Primary stage	13	12.4
Middle stage	14	13.3
Secondary stage	47	44.8
Senior secondary stage	15	14.3
Undergraduate	5	4.8
OCCUPATION		
Housewife	91	86.7
Employed	14	13.3
SOCIOECONOMIC STRATA		
Upper	1	1
Upper middle	0	0
Lower middle	14	13.3
Upper lower	57	54.3
Lower	33	31.4

Table 2 shows distribution of socio-demographic factors among women accepting PPIUCD is 79% in the age group of 21-30 years.

In this group 87% of women were primiparous, 92% of women were Hindu, followed by Christian 9% and Muslim 4%. Educational qualification of almost 50% study subjects were upto Secondary Stage, followed by Senior Secondary >Middle Stage >Primary Stage >No Formal education >Undergraduate. 57% and 41.8% of study subjects belonged to upper lower socioeconomic strata while 1% belonged to upper socioeconomic strata.

Table 3: Complications at 6th month, 12th month and 18th month.

	At 6th month		At 12th month		At 18th month	
	N	%	N	%	N	%
Pain Abdomen	5	4.8	3	2.85	1	1
Bleeding	3	2.9	4	3.8	1	1
Expulsion	2	1.9	0	0	2	1.9
Pregnancy	0	0	0	0	2	1.9
Infection	0	0	0	0	2	1.9
No complications	80	76.2	69	65.7	58	55.2
Lost to follow up	15	14.3	29	27.6	37	35.2

Table 3 shows complications at sixth month, one year and one and half year.

Most complications at the end of 6th month was pain abdomen (4.8%). At the end of one year bleeding was the most common complication i.e. 3.8%.

The most common complication at the end of One and Half year is expulsion (2 cases), followed by infection (2 cases), pregnancy (2 cases), bleeding and pain abdomen (1 case each). 37 cases either lost to follow up or had Copper T (CuT) removed.

Table 4: Awareness about PPIUCD in the study subjects

AWARENESS	N	%
Aware	37	35.2
Not aware	68	64.8
Total	105	100.0

Table 4 shows awareness about PPIUCD is very low (35%).

Table 5: Outcomes of PPIUCD insertion after caesarean section

OUTCOMES	N	%
Satisfied	56	53.3
Removed for bleeding	8	7.6
Removed for pelvic pain	5	4.8
Removed for pressure from family	1	1.0
Removed for string problems	0	0.0
Removed for vaginal discharge and pruritis	1	1.0
Removed for pelvic infection	2	1.9
Removed for failure of contraception	2	1.9
Removed as husband/child expired	0	0.0
Expelled spontaneously	6	5.7
Not known/lost to follow up	24	22.9
Total	105	100.0

Table 5 shows outcome of the study. 53.3% were satisfied with its use, 8 (7.5%) cases had it removed for bleeding, 2 cases (1.9%) had it removed for pelvic infection, 1 (1%) had it removed for pressure from family, 1 (1%) had it removed for vaginal discharge and purities vulvae, 2 (1.9%) conceived with Copper T in situ, in 6 (5.7%) cases it got expelled spontaneously. 24 (22.9%) cases lost to follow up.

Table 6 shows 53% continued in this group.

Table 6: Continuation of PPIUCD in the study

	N	%
Removal at 6 months	7	7.00
Removal at one year	9	9.00
Removal at one and half year	8	8
Continued	53	53
Lost to follow up	23	23.00

Discussion

Women soon after delivery are highly motivated and intend for an effective contraception method while if the women are advised to initiate contraception after 6 weeks of their delivery, they may have higher chances of conception and do not manage to come back.

In this study, majority (52%) of woman accepting PPIUCD belonged to age group of 21-25 years, which is similar to study conducted by Sujanendra et al and Katheit G et al, furthermore amongst women accepting PPIUCD, 87% were primiparous, this finding is consistant with study conducted by Sujanendra et al, but contrary to these studies Grimes et al, Sukla et al, and Deshpande et al where they found higher acceptance in multiparous client.[4,8] The reason for lower acceptance for PPIUCD in our study among para 2 or more was that they underwent tubectomy. In this study, acceptance of PPIUCD was higher among women with secondary stage education

and senior secondary stage education i.e. 47% and 15% respectively than those with no formal or higher education i.e. 11% and 5%, similar to study conducted by Sujanendra et al and 57% of present study subjects belonged to Upper Lower Socioeconomic strata.[4]

In this study, follow up visits were conducted at 6th month, 12th month and 18th month and complications noted 105 subjects in Cesarean Section. Pain was reported as 5%, 3% and 1% in this group at the end of 6 months, 12 months and 18 months respectively. Total 7.9% i.e. 8 cases had pain abdomen. Out of which 5 cases insisted removal, rest 3 cases continued with it and pain subsided with intake of Analgesics. Similar to study performed by Katheit G et al where minor abdominal pain consisted of 12.5% of all complications. Follow up at 6 months, 1 year and one and half year 3 (2.9%), 4 (3.8%), 1 (1%) cases of bleeding per vagina following Intracesarean PPIUCD. So at the end of one and half year, 8 cases (7.8%) of bleeding per vagina in this group were recorded. All of them were prescribed with combination of tranexamic acid and mefenamic acid thrice daily for 5 days but 7 of them had it removed from other private centers. In other studies, 23.5% and 17.79% of clients had bleeding. Infection rate was 0, 0, 2 cases after intracesarean PPIUCD. Infection was on basis of abdominal pain associated with fever and foul-smelling vaginal discharge. Similar to study conducted by Ranjana et al, in my study, 2 cases i.e. 1 intrauterine and 1 extrauterine pregnancy with IUCD in situ was reported after one and half year in this group.[10] The case reporting with intrauterine pregnancy at 16 weeks of gestation termination of pregnancy was done with Copper T removal, and Laparotomy followed by salpingectomy with Copper T removal was done with the one with tubal pregnancy. Present study shows expulsion rate as 2 (1.9%), 0, 2 (1.9%) at 6th, 12th, 18th month in this group. In this study, expulsion with intracesarean insertion i.e. 3.8%. In my study expulsion was detected by history, clinical examination and pelvic ultrasonography. These women were informed about IUCD expulsion and were advised to use alternative method of contraception. According to Chi et al, expulsion rate of PPIUCD at 4 weeks interval was 9.5-12.5%.[11] In this study, 8 (7.6%) removed for bleeding, 5 (4.8%) removed for pelvic pain, 1 (1.0%) removed for pressure from family, 0 removed for string problems, 1 (1%) removed for vaginal discharge and pruritis, 2 (1.9%) removed for pelvic infection, 2 (1.9%) removed for pregnancy with IUCD inn situ, 0 removed as husband or child expired, in 6 (5.7%) cases it got expelled spontaneously following Caesarean section. Continuation rate is 57% following Caesarean section. In contrast to other studies where continuation rate ranges from 62-82%, the continuation rate in my study is very low.[10,11]

Conclusion

The complications associated with Postpartum Intrauterine Contraceptive Device is insignificant, still the awareness, acceptance and continuation are very low. Therefore, the Information Education Communication activity by the field workers must be enhanced to overcome this knowledge gap & in the long run this will improve the acceptance of Contraceptives especially the IUCDs in the general population.

Acknowledgments

Authors would like to thank Dr. Jayanta Ray, Prof. Mamata Pradhan, who has been a continuous support and constant supervision.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Post-Partum IUCD reference manual. New Delhi Family Planning Division, Ministry of Health and family Welfare, Government of India; 2010. Available at http://www.nrhmtn.gov.in/modules/PPIUCD%20Refere nce%20Manual.pdf
2. IUCD reference Manual for Medical Officers, Family Planning Division, Ministry of Health and family weldfare, Govt of India;2010:1-20 Available at https://nrhm.gujarat.gov.in/images/pdf/IUCD_Referenc e_Manual_Nursing_Personnel.pdf

3. Konar H. DC Dutta"s Textbook of Gynaecology. 7th Ed. Jaypee;2016:92-7.
4. Mishra S. Evaluation of safety, efficacy and expulsion of postplacental and intracaesarean insertion of intrauterine contraceptive devices. J Obstet Gynaecol India. 2014;64(5):337-43.
5. Katheit G, Agarwal J. Evaluation of Post-placental Intrauterine Device in terms of awareness, acceptance and expulsions in tertiary care hospital. Int J Reprod Contracept Gynaecol. 2013 Dec;2(4):539-43.
6. Grimes DA, Lopez LM, Schulz KF, Van Vleit HA, Stanwood NL. Immmediate post-partum insertion of intrauterine devices. Cochrane Database Syst Rev. 2010;15:CD003066.
7. Sukla M, Sabuhi Qureshi C. Post-placental intrauterine device insertion: a five year experience at a tertiary care centre in north India. Indian J Med Res.2012;136(3):432.
8. Deshpande S, Gadappa S, Yelikar K, Wanjare N, Andurkar S. Awareness, Acceptability and clinical outcome of post-placental insertion of intrauterine contraceptive device in Marathwada region, India. Ind J Obstet Gynaecol Res. 2017;4(1):77-82.
9. Ranjana Verma A, Chawla I. A follow up study of postpartum intrauterine device insertion in a tertiary health centre. Int J Reprod Contracept Obstet Gynaecol. 2017;6:2800-2805.
10. Chi IC, Wilkens L, Roger S. Expulsions in immediate postpartum insertion of Lippes Loop D and Copper T IUD's and their counterpart Delta devices-an epidemiological analysis. Contraception. 1985;32:119- 34.
11. Mohamed SA, Kamel MA, Shaaban OM, Salem HT. Acceptability for the use of postpartum intrauterine contraceptive devices: Assiut experience. Med Princ Pract. 2003;12:170-175.

IJOPARB
gratefully acknowledges the generous contribution
to the journal by the following esteemed members of the ISOPARB.

Dr S N Tripathy
Dr Shanti H K Singh
Dr Suchitra Pandit
Dr Hiralal Konar
Dr Usha Krishnan
Dr Milind Shah
Dr Meena Samant
Dr Archana Kumari

Instruction to Authors

The Journal of Indian Society of Perinatology and Reproductive Biology which is the official publication of the Indian Society of Perinatology and Reproductive Biology (ISOPARB) invites original research articles in gynaecology / obstetrics / related subjects in the following category: Clinical Articles; Review Articles; and Brief Communications (including Case Reports).

All manuscripts should be prepared according to the guidelines detailed below. Any manuscript that has not been formatted as per the ISOPARB requirements will be returned to the author for correction. All manuscripts should be created and submitted in Word format.

1. SUBMISSION

Authors must submit manuscripts by Email ID –
picklu.chaudhuri@gmail.com
dr_gita _banerjee@yahoo.co.in
hkondr@gmail.com

Hard-copy submissions will not be considered.

Please submit a cover letter to the Editor-in-Chief mentioning the following:

- Each author's name, address, and email address.
- Each author's affiliation and qualifications.
- The name of the author who is to deal with correspondence and proofs.

Once submitted, manuscripts undergo initial screening by the editorial staff and editors and then papers will undergo peer review.

2. Authors must give a separate "Author Guarantee" document mentioning the following:

(1) that all authors have met the criteria for authorship and have participated sufficiently in the work to take responsibility for it;

(2) that all authors have reviewed the final version of the manuscript and approve it for submission to the ISOPARB journal.

(3) that neither this manuscript nor one with substantially similar content by the authors has been published elsewhere or is being considered for publication elsewhere;

(4) that the manuscript has been submitted with the full knowledge and approval of the institutions or organizations given as the affiliation(s) of the author(s);

(5) that the authors have informed the editor in a cover letter and in the manuscript itself of any conflicts of interest; and

(6) that the corresponding author affirms the manuscript to be an honest and transparent account of the study being reported.

In line with ICMJE standards, the criteria for authorship are as follows:

(1) Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND

(2) Drafting the work or revising it critically for important intellectual content; AND

(3) Final approval of the version to be published; AND

(4) Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

3. CLINICAL TRIALS AND REVIEW ARTICLES

Clinical trials

Submission of clinical trials must include reference to ethics approval (or explanation of why ethics approval was not received). Authors must consult the CONSORT statement and checklist and submit a CONSORT flow chart as an editable figure in Word/PowerPoi ntformat.

The clinical trial registration is preferable and information should be included at the end of the abstract of the submitted manuscript.

Review articles

Reviews based on the recent and relevant subjects of clinical interest should be considered.

4. LAYOUT OF MANUSCRIPTS

Manuscript text should be in English (US spelling), double-spaced, font size 12, in Arialmmes New Roman font.

First page

The first page of the manuscript should contain the following: (1) title; (2) full names of authors (6 maximum, although listing more authors may be considered on an individual basis if authorship requirements have been met and a request has been included in the cover letter); (3) affiliations of authors (i.e. department, section or unit of

an institution, hospital or organization, city, and country (4) full contact details (postal address. email address) of the corresponding author ; (5) a list of up to 8 keywords for indexing and retrieval:

Footnotes linking author names to affiliations should be listed as 1,2,3 etc..

The first page should also list the type of article: Clinical Article; Brief Communication: or Review Article.

Abstract

Clinical Articles

A structured abstract not exceeding 200 words is required for all full-length clinical articles. It should contain all and only the following headings: Objective; Methods; Results; and Conclusion.

The Objective reflects the purpose of the study: that is, the hypothesis that is being tested. The Methods should include the setting for the study, the participants (number and type), the treatment or intervention, and the type of statistical analysis. The Results include the outcome of the study and statistical significance, if appropriate. The Conclusion states the significance of the results.

Review articles

An abstract not exceeding 200 words is required for all review articles.

Narrative reviews require an unstructured abstract. Systematic review articles should have a structured abstract with the headings; Background; Objectives; Search strategy; Selection criteria; Data collection and analysis; Main results; and Conclusions.

Brief communications

Brief communications should not include an abstract.

Main text

In full-length articles, subject matter should be organized under the following headings, with no subheadings: Introduction; Materials and methods; Results; Discussion; Acknowl edgments; Conflicts of interest; and References.

Brief communications should not have any headings separating the text.

Clinical articles

The main text of clinical articles should not exceed 2500 words, excluding the first-page information, abstract (no more than 200 words), author contributions, acknowledgments, Conflicts of interest, references (no more than 25), figure legends, and tables and figures. Please include the word count in the cover letter and on the first page of the manuscript.

Review articles

Review articles should have no more than 3000-3500 words in the main text and 40 references. Please include the word count in the cover letter and on the first page of the manuscript.

Brief communications

Brief communications should be no more than 400 words, excluding the first-page information, synopsis, keywords, author contributions, acknowledgments, conflicts of interest, references, figure legends, and tables and figures. There should be no more than 4 references and no more than 1table or 1figure.

Power calculations, statistics, and reporting of numbers.

Power calculations

Where appropriate (e.g. for clinical trials), power calculations should be performed as part of the study design, and a statement providing the power of the study should be included in the Materials and Methods. Authors should state how the power calculation was determined, including what type of difference the calculation was powered to detect and on what studies the numbers are based.

Statistics

The statistical tests used and the significance level set should be listed in the methods for all studies that employed statistical analysis. Information regarding the statistical software programs used should be included in the methods: for example, "SPSS version 20 (IBM, Armonk, NY, USA)." This information should not be included in the reference list.

P values should be provided where calculated. The largest P value that should be expressed is $P>0.99$. The smallest P value that should be expressed is $P<0.001$.

For measures of effect (e.g. relative risks, risk ratios, odds ratios), authors should also report confidence intervals (e.g. 95%) so that the precision of the effect estimate can be assessed.

5. Ethics approval and informed consent

Studies of patients, patient records, or volunteers require Ethics Committee approval and informed consent.

Ethics approval

Include a statement in the methods that the research protocol was approved by the relevant Institutional Review Board or Ethics Committee before the study began; if such approval was not needed/obtained, include an explanation. Authors must provide copies of the appropriate documentation if requested.

Informed consent

Include confirmation in the methods that all human participants gave written informed consent before the study began; if consent was not needed/obtained, include an explanation. Authors must provide copies of the appropriate documentation if requested.

6. Acknowledgments

Sources of funding should be acknowledged by the author(s), along with the names of individuals who do not fulfil the criteria for authorshi p, but who have made a substantial contribution to the manuscript.

7. Confllcts of Interest

A conflict-of-interest statement must be included in the cover letter and before the reference list in the manuscript. It should list any relationships (for any author) that may be deemed to Influence the objectivity of the paper and its review, or state that no such relationships exist. Commercial associations, either directly or through immediate family, in areas such as expert testimony, consulting, honoraria, stock holdings, equity interest, ownership, patent-licensing situations or employment that might pose a Conflicts of interest should be stated. Conflicts for other reasons, such as personal relationships or academic competition, should also be stated.

8. References

The number of references should not exceed 25 for clinical articles, 40 for review articles, and 4 for brief communications; in general, they should be limited to the past decade. They must be numbered and listed as they are cited in the article, using Index Medicus abbreviations for journal titles. Cite the names of all authors when there are six or fewer; when there are seven or more, list the first three authors followed by "et al." Include the volume number.

Journal article

[1] Vellacott ID, Cooke EJ, James CE. Nausea and vomiting in early pregnancy. Int J Gynecol Obstet. 1988;27:57-59 .

Book

[2] Speroff L, Glass BH, Kase NG. Clinical Gynecologic Endocrinology and Infertility. Baltimore: Williams and Wilkins; 1982.

Chapter in a book

[3] Disaia PJ, Creasman WT. Invasive Cancer of the Vulva. In: Disaia PJ, Creasman WT, eds. Clinical Gynecologic Oncology. St Louis: C.V. Mosby; 1984:214-219.

Web reference

[4] World Health Organization. WHO Recommended Surveillance Standards, Second Edition [WHO website). 1999. http://www.who.int/csr/resources/publications/surveillance/whocdscsrisr992.pdf.

Text references can be indicated by Arabic numerals in superscript. abc[1]

Tables

Each table should be titled, numbered (with Arabic numerals), and placed on a separate page after the reference list (not embedded within the main text).

All tables must be cited in numeric order in the main text as "Table 1" etc.

Footnotes to tables should be listed as a, b, c etc.

9. Figures and photographs

Figures and photographs should be submitted as jpg format. CONSORT flow charts should be created and submitted as editable Word/ Power Point files. All figures must be cited in numeric order in the main text as "Figure 1" etc.

Figure permission

All authors wishing to use figures (or any material) that have already been published must first obtain the permission of the original author and publisher and/or copyright holders, in addition to giving precise reference to the original work. This permission must include the right to publish in electronic media. Confirmation should be included in the cover letter (the actual permission correspondence from the copyright holder does not need to be submitted).

Photograph/video consent

If photographs or videos of identifiable people are used, authors must obtain and submit a signed statement of informed consent from the identifiable person(s) or their next of kin. Authors should not try to conceal identity with black bars over eyes etc.

9. Drugs

Give generic names of all pharmaceutical preparations and, where appropriate, include the trade name and manufacturer's name and address. Review drug names and dosages with care. The author is responsible for all recommended dosages.

10. Plagiarism

Plagiarism entails the "use or close imitation of the language and thoughts of another author and the representation of them as one's own original work." Self-plagiarism, a form of misconduct in which an author reuses his/her previously written text, data, or ideas, wholly or in part, without indicating previous dissemination, will also be considered plagiarism. Verbatim copying of sentences, even if a citation is provided (unless the sentence appears in quotation marks), is considered to be plagiarism.

11. ON ACCEPTANCE

If your paper is accepted for publication, you will receive an email informing you of this decision.

12. Copyright

Once accepted and published, all copyright will belong to ISOPARB. No part of the article could be published without permission. All disputes are subjected to Indian Jurisdiction.

13. It is desirable that the, author(s) submitting article in IJOPARB be a member of ISOPARB.

####

Influence of Sickle Cell Trait on Pregnancy Outcome

Dr Piyusha Chandrayan,[1] Dr Krishna Patel,[2] Dr Kishor Chauhan,[3] Dr Usha Parekh[4]

The core of the antenatal care programs was developed in the early 20th century. The pre-defined screening of pregnant women by a series of examinations and tests at different stages of gestation was designed to detect conditions that threatened the pregnancy. This is known as risk approach. Test for detection of Sickle cell being one of them, as the current knowledge of sickle cell trait in pregnant women is not well understood. Exploring factors that may impact individuals' knowledge of sickle cell trait, will help improve the focus of genetic counselling and assist health care professionals in educating the patients.

SICKLE CELL ANAEMIA:

Sickle cell anemia include both sickle cell disease and sickle cell trait. The first one is homozygous form with SS genotype whereas the latter on is heterozygous form SS. In this both MCV and MCHC is reduced. Due to the presence of Hb S these patients are subjected to chronic hypoxia. Sickle cell trait is minor form of Sickle cell anemia. This is similar to Thalassemia minor.

There are more chances of Sickle cell disease patients to land into crisis during an acute episode of physical exertion, dehydration etc. However, in SCT patients crisis can occur if the foetus and mother both are SCT. Thus, it is recommended to supplement the patients with SCT with hydroxyurea in 2nd/3rd trimester of pregnancy to prevent intrapartum and postpartum complications.

SICKLE CELL TRAIT:

It results from inheritance of one gene for hemoglobin S and one for normal hemoglobin A. The heterozygous inheritance of the gene for hemoglobin S results in sickle cell trait or AS hemoglobin. Hb A is most abundant and the amount of hemoglobin S averages only approximately 30% in each red cell.[2]

Health Concerns of individuals with SCT:

Traditionally, sickle cell trait has been viewed as benign condition, non-disease, partially protective against falciparum malaria and without any painful episodes characteristic of the homozygous sickle cell disease. On population basis, sickle cell trait has no discernible impact on life expectancy.[6]

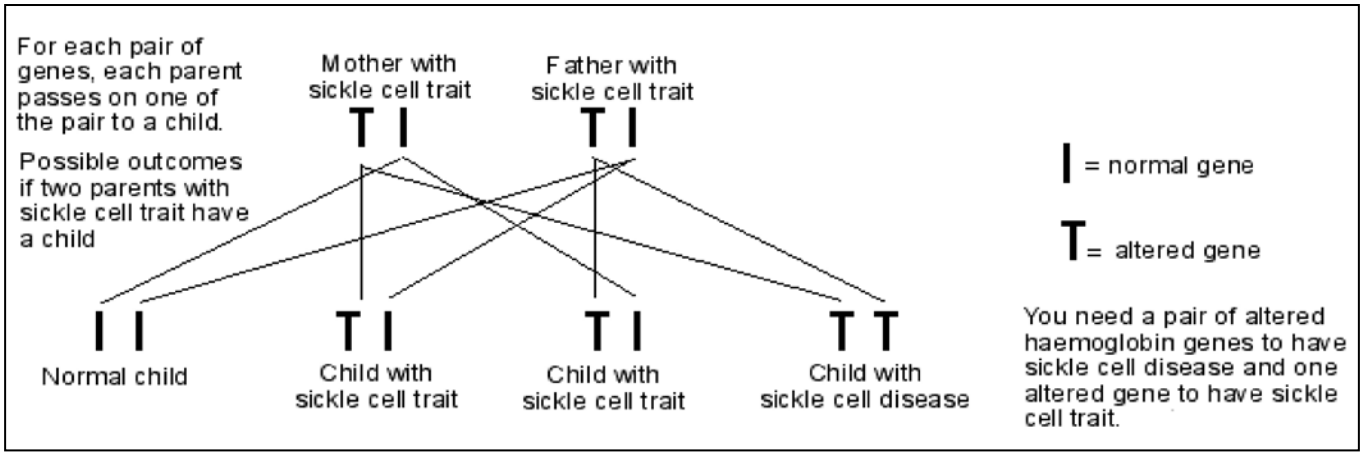
Individuals who are heterozygous for Hb S are carriers of the sickle cell trait (SCT). Heterozygous individuals are not anaemic and have normal red blood indices with hemoglobin S percentages near 40%.[2]

They generally enjoy normal life spans without serious health consequences related to their sickle cell status, but under extreme conditions such as severe dehydration and high intensity physical activity, complications such as exertional rhabdomyolysis, splenic infarction, and renal papillary necrosis can occur.[3]

Sickle cell trait occurs in approximately 300 million people worldwide, with the highest prevalence of approximately 30 to 40% in sub-Saharan Africa.[4] In

1. MS OBGY, Assistant Professor, Dhiraj Hospital
2. 2nd year DGO Resident, Dhiraj Hospital
3. Professor, OBGY, Dhiraj Hospital
4. DGO, MS OBGY, Dhiraj Hospital
Corresponding author:

Acquiring sickle cell trait:



regions, of the world where malaria is endemic, SCT confers a survival advantage in childhood malaria, this was thought to be a major selective pressure for persistence of the Hb S mutation (Glu6Val).

There are evidences that carriers have occasional hematuria, renal papillary necrosis, and hyposthenuria[4] However, women with sickle cell trait are not at great risk for abnormal reproductive course.

Pre-conceptional counselling:

One important problem sickle cell trait is the possibility of transmission of the abnormal gene to their discordant. Women with sickle cell trait should have pre-conceptional counselling and the male partner should be examined to determine whether or not he also carries the trait.

In case, the father is a carrier there is 25% chance that the infant will be homozygous and will be sickle cell disease. In this situation, early prenatal diagnosis is important because it will allow the possibility of pregnancy termination. Early pre-natal diagnosis is possible with the use of polymerase chain reaction (PCR).

Influence on Pregnancy & Labour:

Adequate management of pregnant women with sickle cell hemoglobinopathies requires close observation. These women maintain hemoglobin mass by intense hemopoiesis in order to compensate for the markedly shortened RBC's life span.

Prenatal folic acid supplementation with 4mg/day is needed to support the rapid turnover of red blood cells.[5]

Assessment of fetal health is also important as it may lead to fetal growth restriction and perinatal morbidity. A series of serial sonography and antenatal fetal surveillance should be carried out.

Aims

- To study fetal outcome in terms of mortality and morbidity.
- To study maternal outcome in terms of mortality & morbidity in cases of women in labor/postnatal women with sickle cell trait.

Objectives

- To detect the sickling status of the spouse to offer genetic counselling for future pregnancies.
- To compare the feto-maternal outcome of pregnant women/women in labor/postnatal women diagnosed with sickle cell trait, to that of feto-maternal outcome of CONTROL GROUP of normal pregnant women/women in labor/postnatal women, at the same institution.

Material and Methods

Study Place: This prospective study was carried out at Dhiraj General Hospital from February 1st 2014 to July 2015.

Source of Data: A standard protocol is applied for all antenatal clients, complete blood count and sickling test was carried out routinely. If sickling test was positive then hemoglobin electrophoresis was carried out. All patients with positive sickle cell test were included under this study and the pregnancy outcome was compared with sickling negative patients.

Study Design: It was a prospective, comparative, non-randomized study.

Sample size: 100 (50 control group, 50 case group)

INCLUSION CRITERIA:

1. Every pregnant woman registered at routine antenatal clinic of Dhiraj General Hospital that shows SCT on Electrophoresis irrespective of her gestation, parity and previous obstetrical outcome.
2. Every registered or unregistered pregnant woman admitted to labor ward in emergency hours at Dhiraj General Hospital that shows SCT on Electrophoresis irrespective of her gestation, parity and stage of labor.
3. Control subjects will be randomly sampled from a list of pregnant patients (approximately similar to study group with respect to age, parity, gestational age etc.) visiting the antenatal clinic/came in labor at Dhiraj General Hospital between the same study periods but are not positive for SCT.

EXCLUSION CRITERIA

- Pregnancy with Sickle Cell Disease
- Pregnancy with SCT with other associated medical risk factors which can influence the course of pregnancy and its outcome like cardiovascular diseases, DM. etc.

Table 1: Booking Status

BOOKED/ EMG	Group			
	Case (HbS)		Control	
	Number	Percentage	Number	Percentage
Booked	33	66.0%	40	80.0%
Emergency	17	34.0%	10	20.0%
Total	50	100.0%	50	100.0%

Most of the patients were booked, in both the groups (66% in case group and 80% in control group)

Table: 2 Hemoglobin level+

	Case (HbS)		Control	
HB	Number	N %	Number	N %
< 6	6	12.0%	0	0.0%
6 to 10	21	42.0%	18	36.0%
> 10	23	46.0%	32	64.0%
Total	50	100.0%	50	100.0%

Chi square: 7.07, p value: 0.02-S

In patients with SCT, 54%. Of the patients had mild and moderate anemia. Those with severe anaemia (12%) received Blood Transfusion. In control group, majority of the patients were not anaemic (64%.).

Table: 3 Urine Routine/ Microscopy

	Case (HbS)		Control	
Urine Routine/Microscopy	Number	N %	Number	N %
ALB TRACE	1	2.0%	1	2.0%
ALB +1	3	6.0%	0	0.0%
ALB +2	1	2.0%	0	0.0%
>ALB+3	4	8.0%	0	0.0%
PUS CELLS++	4	8.0%	1	2.0%
NORMAL	37	74.0%	48	96.0%

Chi square: 10.4, p value: 0.06-NS

Mostly the patients in case group and control group were asymptomatic, 80% vs 96% respectively. In SCT, 8% patients presented with UTI.

Table: 4 Associated Antenatal Complications

Associated Antenatal Complications	Case		Control		
	Number	N %	Number	N %	P value
Pregnancy Induced Hypertension	4	8.0%	1	2.0%	0.1 NS
Intrauterine Growth Retardation	1	2.0%	1	2.0%	0.3 NS
Oligohydramnios	10	20.0%	5	10.0%	0.11 NS
Polyhydramnios with congenital anomaly	2	4.0%	1	2.0%	0.12 NS
Anemia	27	54.0%	18	36.0%	0.02 S
Recurrent Urinary Tract Infections	6	26.0%	0	0.0%	0.06 NS
Total	50	100%	26	52.0%	

Chi square: 4.46, p value: 0.48-NS

The most common associated Antenatal complications encountered is anemia. In case group it is 54%, whereas in control group, it is 36 %.

Table: 5 Pregnancy outcome

Pregnancy Outcome	Case		Control		
	Number	%	Number	%	P value
IUGR	1	2.0%	2	4.0%	
Preterm	26	52.0%	10	20.0%	0.0008 S
Post term	1	2.0%	2	4.0%	
Abortion	1	2.0%	0	0.0%	
Still birth	1	2.0%	0	0.0%	
Intrauterine demise	0	0.0%	0	0.0%	
Term	21	42.0%	36	72.0%	0.002 S

Chi square: 13.7, p value: 0.017-S

In this study, most of the deliveries were preterm, 52% in SCT group, whereas in control group, term deliveries, 72%, was a common outcome.

Table 6: Analysis of NICU Admission

CAUSES	Case Number		Control	
Preterm care	11	28.0%	2	4.0%
Birth Asphyxia	6	12.0%	5	10.0%
Transient Tachypnoea of New born	2	4.0%	3	6.0%
IUGR	1	2.0%	0	0.0%
Sepsis	2	4.0%	1	2.0%
Congenital Anomaly	2	4.0%	0	0.0%
PT with RDS	3	6.0%	0	0.0%
Neonatal hyperbilirubinemia	1	2.0%	4	8.0%

Chi Square: 11.8, p value: 0.1072 –NS

The most common cause of NICU admission in case group is preterm 28%. In control group it is for birth asphyxia 10%

Table 7: Postpartum Complications

POSTPARTUM COMPLAINS	Case		Control	
	Number	N %	Number	N %
PPH	4	8.0%	2	4.0%
Leg Cramps	5	10.0%	0	0.0%
Wound Infection	1	2.0%	1	2.0%
Perineal tear	2	4.0%	1	2.0%
Fever	7	14.0%	1	2.0%

Chi Square: 2.667, p value: 0.44 –NS

In case group, the most common postpartum complaint was fever 14% vs 2% in case and control group respectively. In control group the most common post-partum complaint was post-partum hemorrhage, 4%.

Table 8: Spouse sickling

	Case (SCT positive)	
Spouse Sickling	Number	Percentage
Not Known	22	40.0%
Negative	23	46.0%
POSITIVE	5	10.0%
Total	50	100.0%

It was found that 10% of the Spouse were sickling positive in SCT group. Among these all were sickle cell trait. However, 40% patients' spouse didn't agree for the test. Control included sickling negative.

Table 9: outcome

Pregnancy Outcome	CASE		CONTROL		P value
	Number	%	Number	%	
Preterm deliveries	26	52	10	20	S (0.0008)
NICU admission	28	56	15	30	S (0.008)
Neonatal deaths	6	12	2	4	NS (0.14)
Anemia	27	54	18	36	NS (0.07)
Postpartum complications	19	38	5	10	S (0.001)

DISCUSSION

National and local SCT scenario

India tops the list of countries with sickle cell disease (SCD) with an estimated 44,000 live births in 2010 and a prevalence of 10%–33%[1,4] About 10-15% of the tribal population of India is in Gujarat, particularly in South Gujarat and prevalence of sickle cell trait (SCT) varies from 0 to 31.4% among different tribes.[14]

The tribal population is distributed in various districts of the state such as Sabarkantha, Banaskantha, Panchmahal, Vadodara, Narmada, Bharuch, Surat, Valsad, Dang and Div-Daman.[9]

SCT is frequently detected in tribal people such as Bhils, Gamit, Dhodia, Dubla, Koli, Naika, Rohit, Konkana.[15]

Our study was carried out in Dhiraj General Hospital, which is a rural tertiary health care facility, affiliated to SBKS MC&RC, located,16 kms away from the Baroda city. It covers an area of around 7,550 sq kms of rural areas. The location of the S.B.K.S. Medical & Research institute is in the Waghodia Taluka of Baroda District which is a part of the TRIBAL BELT of Gujarat.

Incidence of SCT and SCD

As per this study, the incidence of SCT is 11.5% whereas that of SCD is 2.0%. These figures include all the diagnosed ANC and PNC cases at this institute irrespective of the booking status at the time of admission to labour ward.

Socio demographic distribution of the study population:

An attempt to match the age, parity and gestational age was made between the case (SCT) and control group (Non SCT).

The most common age group in our study in case group is 21-25 years accounting for 48% which is also the common age group in control (52%)

In a study by Ilham M. Hamdi et al,[10] three thousand five hundred and one pregnant Omani women consisting of SCT as case group and normal patient as control group, the average age was 27 years in both groups. This is slightly higher than our study group.

Booking status:

In our study, mostly the patients were booked 66% in case group and 80% in control group. The high percentage of booked SCT women in both the groups was due to good ANC services with free ANC packages &free check-up for Sickling Test offered to all the women attending ANC clinic. With the implementation of Government Janani Surakhsa Yojna and Cheeranjeevi Yojna at Dhiraj Hospital, institutionalising the delivery of poor and needy tribal women has been made possible.

Hemoglobin level

In this study, mild and moderate anemia was found in 42% vs 36% in control group. Severe anemia was present in 12% of SCT patients.

Non anemic consisted of 46% vs 64% in case and control, showing that mostly the control group was non anemic and case group accounted for 52% anemia.

The p value is significant and it co relates well with other study.

(p value 0.02) (Table 10)

Comparison with other studies:

Anaemia	Case	Control	P value
Ilham M. Hamdi et al[10]	41.4%	25.2%	S
Larrabee and Monga, et al[18]	3.82%	1.0%	S
Shumaila Zia et al[17]	35%	9.96%	S
Surekha Narayan Khandale, Kshama Kedar et al[19]	5.33%	0%	S
This study	54%	36%	S

The incidence of anemia is high in our study in SCT group. Probable cause of this is higher incidence of coexisting nutritional deficiency anemia and lack of awareness about the disease in patients, as most of the patients are from low socio economic class and tribal zone. These patients had poor hygiene and many had hookworm infestation.

Urine routine and microscopy

In case group, though Recurrent UTI was not common, it was found in 12% patients. Asymptomatic bacteriuria was present in these cases. Whereas in control group it was only 4% (table 12). High albumin levels was also present in pre-eclampsia patients. (p value 0.06)

As compared with other studies-

UTI	Case	Control	P value
Peggy J. Whalley et al[12]	13.9%	6.4%	S
Tuck SM, et al[20]	6%	0%	NS
Baill, et al[11]	13-15%	0%	NS
Abdulsalam, et al[13]	3.1%	0%	NS
Sonwane Anju et al[20]	1.07%	0%	NS
This study	12%	2%	NS

Our result co relates well with other studies. Our patients in case group presented with recurrent UTI. Asymptomatic bacteriuria was found on investigation. These patients required symptomatic treatment during the pregnancy. However, symptoms relieved following delivery.

Associated Antenatal Complications

In our study, among the associated Antenatal complications, in SCT group PIH was found in 8% patients, intrauterine growth retardation in 2%, oligohydramnios in 20%, polyhydramnios with congenital anomaly in 4%, anemia in 54% and recurrent UTI in 12% of case group whereas in control group it was 2%, 2%, 10%, 2%, 36%, 4% respectively. The p value is non-significant

When compared with other studies-

	PIH	IUGR	OLIGO	POLY	DIB
Ilham M. Hamdi et al[10]	6.8% 8% NS	6.3% 6.6% NS	2.8% 1.8% NS	0.3% 1.5% NS	4.3% 5.8% NS
Shumalia Zia et al[17]	7.2% 1.0% -	1.2% 1.0% -	- - -	- - -	- - -
Taylor et al[7]	7.4% 1.0% NS	12% 7% NS	- - -	- - -	1.0% 0.5% NS
This study	8% 2% NS	2% 2% NS	20% 10% NS	4% 2% NS	- - -

This is comparable with Hamdi and Taylor studies.

As per our study, the most common antenatal association included anaemia in SCT group as

sickling is common and the life span of RBC's are reduced. Second most common finding included oligohydramnios. This was a USG finding. Prematurity was commonly associated with oligohydramnios in our study. Rest of the complications were in minority like PIH was present in 8% of the patients and as stated above recurrent UTI in 12%.

Gestational Age at the time of labour

Early preterm (28-32 weeks) – 10% versus 2%

Late preterm (33-36 weeks) – 38% versus 16%

Term deliveries (37-40 weeks) – 44% versus 80% (table 13)

As per other studies:

	Preterm labour		
Ilham M. Hamdi et al[10]	7.8	8.8	NS
Taylor et al[7]	52%	15%	S
Schulman and Whalley et al[12]	4.4%	3.4%	NS
Surekha et al[19]	14.6	10	-
This study	48%	18%	S

Our study has significant p value which co relates well with Taylor et al, study showing more preterm deliveries in SCT group. This could be due to increased sickling causing decreased placental perfusion, thus early activation of parturition process causing early preterm deliveries.

Current pregnancy outcome

On comparing with other studies

	Preterm deliveries	Term deliveries	Abortion	IUD/SB
Hamdi et al[10]	7.8% 8.8% -	83.0% 83.9% -	4.6% 2.6% -	1.3% 1.1% NS
Taylor et al[7]	52% 15% S	40% 81% S	8% 4% -	9.7% 3.0% -
This study	52% 20% S	42% 72% S	2% 0% -	2% 0% -

Our study co relates with Taylor study. The preterm deliveries was significantly more 52% in case group versus 20% in control group. This is a tertiary centre and mostly the patients are booked, so the percentage of IUD is nil in both groups and still birth and abortion is also relatively less (Table 15)

NICU admission, causes of admission & neonatal death

1. As per this study, the percentage of new born requiring NICU admission was 66% in case group whereas in control group it was 30%. (Table 19)
2. The most common cause of NICU admission in case group was for preterm care 28% vs 4% in control group. Remaining causes included birth asphyxia 12% vs 10%, TTN 4% vs 6%, IUGR 2% vs 0%, sepsis 4% vs 2%, congenital anomaly 4% vs 2%, Preterm care with RDS 6% vs 0%, neonatal hyperbilirubinemia 2% vs 8%. Most commonly preterm deliveries was seen in case group requiring NICU admission for preterm care. Other causes included birth asphyxia, TTN (transient Tachypnoea of new born), IUGR, and for congenital anomalies which was associated with polyhydramnios. Neonatal hyperbilirubinemia was more common in control group as they were term deliveries (Table 20)
3. Among these 12% was neonatal death in case group and 4% in control group (Table 21). This is statistically significant. The cause of neonatal death in case group included,

2 deaths due to respiratory distress syndrome in preterm premature babies.

2 deaths due to severe birth asphyxia

1 death due to congenital anomaly (spina bifida)

1 death due to early onset of sepsis

In control group, 2 deaths occurred due to severe birth asphyxia.

Comparing with other studies:

	NICU adm			Neonatal Death		
Hamdi et al[10]	-	-	-	2.9%	0%	S
A.B. Adeyemi[16]	More	Less	-	4.9%	0.9%	S
Taylor at al[7]	-	-	-	6.7%	3.5%	S
Surekha et al[19]	-	-	-	13.22	2.6%	S
This study	66%	30%	-	12%	4%	S

Our study result co relates well with above studies.

Post-partum complications

As per other studies:

	Fever	PPH	WI	Leg cramps
Surekha et al[19]	2.67 1.0 -	- - -	- - -	- - -
Abdulsalam et al[13]	15% 6.2% S	- - -	- - -	- - -
This study	14% 2% S	8% 4% NS	2% 0% NS	10% 0% NS

Our study co relates with Abdulsalam study and is stastically significant in case of fever. In other complications it is non-significant.

1. The most common post-partum complication included fever in case group 14% and 2% in control group. There was due to development of postpartum endometritis in 2 patients. And puerperal pyrexia was present in 4 of our patients and 1 patient developed puerperal sepsis. Intravenous antibiotic was given to these patients which helped in faster recovery. This was due to poor hygiene and poor nutritional status of the patient.
2. There was also a case of wound infection following cesarean section. This was due to poor hygiene of the patient and the patient had severe anaemia.
3. PPH was present in 8% of case group and 4% in control group 2 following vaginal delivery and 2 following caesarean section. These patients were managed and recovered well.
4. Leg cramps was observed in 10% of SCT group with none in control group. They were given symptomatic treatment. USG of legs were carried out and DVT was ruled out. None of them suffered from DVT.
5. Perineal tear was seen in 4% of case vs 2% in control group (Table 21)

THERE WAS NO MATERNAL MORTALITY IN SCT GROUP AND NON SCT GROUP.

Spouse sickling

This was carried out only in case group. The sickling status was not known in 40% as they were unwilling. Negative in 46% patients' spouse. Positive in 10%. These all were sickle cell trait (Table 22)

In this study, spouse sickling was also done along with patient in order to find out the chances of transmission to offspring. Genetic counselling was offered and it was left for the patient and her family to decide upon the future of pregnancy. Apart from all spouse sickling studied 10% were sickling positive. Among these all were sickle cell trait. Around 40% spouse of diagnosed SCT and SCD patients refused for this test. This was because most of our patients are tribal, low socio economic patients. They lack education and are non-affording. So, this test could not be carried out in them.

Conclusion

Sickle Cell Trait is considered a benign state. However, pregnancy is itself a stressful situation so these patients require tertiary health care to deal with the complications and disapproves the null hypothesis that was antenatal, intra natal, and postnatal course of pregnancy in women diagnosed with sickle cell trait is comparable with pregnant women without sickle cell trait.

The Sickle Cell Trait patients should undergo ANC registration as early as possible and should go for institutional deliveries with NICU and blood bank facility.

First of all, a regular, vigilant and meticulous antenatal care, close observation coupled with multi-disciplinary approach is necessary to get healthy mother and healthy baby in these patients. It should be aimed to avert, detect and abort all possible complications, during this period, to obtain the best possible maternal and perinatal outcome.

Expert intrapartum management is needed to rescue impeding morbidities and mortalities to mother and foetus.

Sickle Cell Trait can be an important contributor for adverse maternal and perinatal outcome. So, the Asha workers should be trained to tackle post-partum complications in these patients.

A good counselling centre should be available in the institution and provision should be made for the spouse of SCT patients to undergo sickling and Hb electrophoresis test to be made free of cost. The test if positive, genetic counselling should be provided to the couple before or after conception.

REFERENCES

1 Ian Donald's Practical Obstetric Problems, seventh edtion, 2017 ©RenuMisra, pg 209-210.

2. Milner, P. F., B. R. Jones, and J. Döbler. "Outcome of pregnancy in sickle cell anaemia and sickle cell-haemoglobin C disease. An analysis of 181 pregnancies in 98 patients, and a review of the literature." *American Journal of Obstetrics and Gynecology* 138.3 (1980): 239-245.

3. Sears, David A. "The morbidity of sickle cell trait: a review of the literature." *The American Journal of Medicine* 64.6 (1978): 1021-1036.

4. Stockman, James A., et al. "Occlusion of large cerebral vessels in sickle-cell anaemia." *New England Journal of Medicine* 287.17 (1972): 846-849.

5. Tsaras and co-workers,2009 Barahimi, Behin, Ann P. Murchison, and Jurij R. Bilyk. "Forget me not." *Survey of ophthalmology* and gynaecology 55.5 (2010): 467-480.

6. Origin and Distribution of Sickle Cell Disease Health Care Providers - The Child with Sickle Cell Disease

7. Stockman, James A., et al. "Occlusion of large cerebral vessels in sickle-cell anaemia." *New England Journal of Medicine* 287.17 (1972): 846-849.

8. Origin and Distribution of Sickle Cell Disease Health Care Providers - The Child with Sickle Cell Disease

9. American College of Obstetrics and Gynecology. Obstetrics &Gynecology, January 2007

10. Larabee KD, Monga M. Women with sickle cell trait are at increasedrisk for pre-eclampsia. Am J Obstet Gynecol. 1997;177:425-428.

11. A STUDY ON THE SCOPE OF CLINICAL MORBIDITY IN SICKLE CELL TRAIT BY AZZA A. G. TANAWY, 2014 The scope of clinical morbidity in sickle cell trait Pediatric Department, Hematology Oncology Unit, Faculty of Medicine, Ain Shams University, Cairo, EgyptReceived 17 July 2014

12. Treadwell MJ, McClough L, Vichinsky E. Using qualitative and quantitative strategies to evaluate knowledge and perceptions about sickle cell disease and sickle cell trait. Journal of the National Medical Association. 2006;98(5):704-710.

13. Moxley, Kristan Michelle. Impact of Carrier Screening on Pregnant Women's Knowledge of Sickle Cell Anemia. Diss. Case Western Reserve University, 2008.

14. Cecil Medicine. Breda, Laura, and Stefano Rivella. "Modulators of erythropoiesis: emerging therapies for hemoglobinopathies and disorders of red cell production." Hematology/oncology clinics of North America 28.2 (2014): 375-386.

15. Goldman's Cecil Medicine, Expert Consult Premium Edition--Enhanced Online Features and Print, Single Volume, 24: Goldman's Cecil Medicine. Vol. 2. Elsevier Health Sciences, 20

16. Bhatia HM, Rao VR. Bombay, India: Institute of Immunohaematology (ICMR) publication; 1986. Genetic atlas of Indian tribes; pp. 263–73.

17. Okwi, Andrew L., et al. "An up-date on the prevalence of sickle cell trait in Eastern and Western Uganda." BMC Hematology 10.1 (2010): 5.

18. Green, R. L., R. G. Huntsman, and Graham R. Serjeant. "Sickle-cell and altitude." British medical journal 1.5803 (1972): 803.

19. Hamdi, Ilham M., et al. "Pregnancy outcome in women with sickle cell trait." Saudi medical journal 23.12 (2002): 1455-1457.

20. Lee A, Thomas P, Cupidore L, Serjeant B, Serjeant G. Improved survival in homozygous sickle cell disease: lessons from a cohort study. BMJ 1995; 311:1600-1602.

Audience at 35th ISOPARB National Conference at the Park Hyatt, Hyderabad

MIDTERM
ISOPARB CONFERENCE

Organised by **ISOPARB Ranchi Chapter**

14-15 September 2019 | Mayuri Hall, Kanke Road, Ranchi

Theme: **Preventing the Preventables**

Highlights

Late Dr. Raj Kishori Jha Oration
Interesting Panel Discussions
Exhaustive Scientific Deliberations

If undelivered, return to:
Indian Journal of Perinatology and Reproductive Biology
CD-55, Salt Lake City, Sector - 1, Kolkata 700064