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Gynecology & Obstetrics

High Risk Pregnancies

Bacterial Vaginosis during Labour

Highlights

Perimortem Caesarean Delivery

Study of Maternal and Fetal Outcomes

Discovering Thoughts, Inventing Future

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Study of Maternal and Fetal Outcomes in High Risk Pregnancies

By Dr. Ankita Metkari, Dr. Ashrulina Pal & Dr. Tushar Tatyana Palve

Abstract- *Background:* Objectives of the current study were to detect high-risk-risk-risk factors in pregnancy their presentations and to develop a simple scoring system to identify and categorize high-risk pregnancies and to predict the maternal and neonatal outcomes by comparing our results to previous studies.

Methods: In this retrospective study, antepartum, intrapartum and neonatal parameters were integrated into the clinical records and the relationship of a risk score to the outcome was evaluated for 346 randomly selected pregnant patients over 7 months

Conclusions: The present study shows that we achieve comparative and better results in high-risk pregnancy, improving both maternal and fetal outcome at our institute.

Keywords: *high-risk pregnancies, perinatal and maternal mortality, scoring system.*

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I. Introduction

High-risk pregnancy is defined as one which is complicated by a factor or factors that adversely affect the pregnancy outcome- maternal or perinatal or both. A high-risk pregnancy may be identified by using a scoring system such as the system developed by Hobel et al.1 Risk scoring system may be defined as a formalized method of recognizing, documenting and cumulating antepartum, intrapartum and neonatal risk factors to predict complications for the fetus and newborn. Among the mothers seen in the antenatal period, only 10-30% of mothers have been classified as high-risk. Out of those, 70-80% end up with perinatal mortality or morbidity. One of the most pressing public health issues in developing countries is perinatal mortality. Recent studies have shown that still perinatal mortality and morbidity is high-risk in India. It shows high-risk pregnancy is one of the leading causes of increasing perinatal morbidity and mortality. Early detection of high-risk pregnancy followed by special intensive care will show a significant change in the perinatal outcome. Treating high-risk pregnancies with extra attention and proper care will give a significant decrease in maternal morbidity and mortality.

A high-risk pregnancy is one of significant risk to the mother or her fetus than an uncomplicated pregnancy. Pregnancy places additional physical and emotional stress on a woman's body. Health problems that occur before a woman becomes pregnant or occuring during pregnancy may also increase the likelihood of a high-risk pregnancy. Any pregnancy can turn into a high-risk one anytime during its course. A pregnancy at risk needs to be identified at an earlier stage, often in the prenatal period to have an effective intervention strategy to deal with its complications. High-risk pregnancy requires sophisticated maternal and fetal surveillance to help in its management decisions to ensure optimal outcomes for both mother and her newborn.

II. About this Study

This study has been conducted in a Tertiary care hospital in Mumbai, spanning over 7 months from January to July 2018 with a sample size of 346 cases dealing with high-risk pregnancies. The high-risk pregnancies included in this study are Gestational hypertension (51 cases), Premature rupture of membranes (75 cases), Oligohydramnios (39 cases), Polyhydramnios (7 cases), Previous LSCS (105 cases), Gestational diabetes mellitus (5 cases), Anemia (11 cases), Intrauterine fetal death (14 cases), Breech presentation (22 cases), Antepartum haemorrhage (8 cases), Multiple gestation (9 cases).

Gestational HTN	PROM	Oligo	Prev LSCS	GDM	Poly	Anemia	IUFD	Breech	APH	Multiple gestation
51	75	39	105	5	7	11	14	22	8	9
14.73%	21.67%	11.27%	30.34%	1.44%	2.02%	3.17%	4.04%	6.35%	2.31%	2.60 %

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Types of High-Risk Pregnancies

a) Gestational Hypertension

At our institution:

					Study by Shobha et al[2]
Parity	Primigravida 54.90%	Multigravida 45.09%			Primi: 60.90% Multi: 39.1%
Baby status	Baby with mother 78.43%	Baby in NICU 15.68%	IUFD(1IUFD WITH OH) 5.88%		IUFD: 9.08% NICU : 39.09%
Mode of delivery	FTND 39.21%	LSCS 47.05%	PTVgD 11.76%	VBAC 1.96%	FTND:28.18% LSCS: 64.54% HYSTERECTOMY:2.72%
Period of gestation	Postdated 19.60%	Term 58.82%	Pre-term 21.56%		

As per the observations made, gestational hypertension was found to be more prevalent among primigravidas (54.9%) than multigravida (45.09%) similar to the findings by Shobha et al in which PIH was more common in Primigravida (60.90%) than in Multigravida(39.1%) Majority of the pregnancies extended to term accounting for 58.82%. LSCS was the most common mode of delivery, accounting for 47.05% of the cases, followed by FTND (39.21%), PTVgD (11.76%) and VBAC (1.96%) respectively, similar to the study by Shobha et al. in which FTND percentage was 28.18% and LSCS was 64.54%. In our institution,15.68% of the babies born were admitted in the NICU for indications like Respiratory distress (87.5%) and Anal atresia (12.5%), unlike in the study by Shobha et al. in which 39.09% babies got admitted in NICU. 5.88% of the pregnancies resulted in Intrauterine fetal demise in our hospital and 9.08%, with factors like HELLP syndrome, abruptio placentae, and anemia being additional contributing factors in the IUFDs. While 2.72% pregnancies terminated with hysterectomy in the study by Shobha et al., at our hospital *one patient with an IUFD underwent Obstetric hysterectomy with transfusion of 4-pint Whole blood and 3-pint FFPs and was under CCU care. Another patient who was a grand multipara with preterm gestation with PIH with HELLP syndrome with anemia with abruption placenta underwent Hysterotomy and was under CCU care.*

b) Premature Rupture of Membranes

					Dr. Zirsangliana Chhangte et al (2018)[3]
Parity	Primigravida 50.66%	Multigravida 49.33%			
Baby status	Baby with mother 81.33%	Baby in NICU 18.66%	IUFD -		NICU ADMISSION 6% BWM: 94%
Mode of delivery	FTND 44%	LSCS 48%	PTVgD 6.66%	Forceps 1.33%	FTND: 55% LSCS: 36% FORCEPS: 1%
Period of gestation	Postdated 18.66%	Term 66.66%	Pre-term 14.66%		

As per our study, the Premature rupture of membranes was found to be more prevalent among Primigravida (50.66%) than Multigravida (49.33%). 18.66% of the babies were admitted in the NICU with the indication of prolonged PROM (>18 hrs) being the most common, accounting for 57.14% of all NICU admissions for IV antibiotics administration, followed by Respiratory distress and Congenital anomaly respectively. Whereas in the study done by Dr. Zirsangliana Chhangte et al. in 2018, 6% of babies were admitted in NICU with 2 % babies diagnosed with early-onset sepsis and 2% with Birth asphyxia. No neonatal mortality occurred in either of the studies. In the study done by Dr. Zirsangliana Chhangte et al. termination by FTND was in 55 % of cases, while 36% needed LSCS most common indication being malpresentation. The Majority of patients were delivered by LSCS (48%) followed by FTND (44%), PTVgD (6.66%), and forceps application (1.33%), respectively, in our study, 66.66% of them were term patients.

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c) *Oligohydramnios*

				Veena Vidyasagar et al[4]
Parity	Primigravida 33.33%	Multigravida 66.66%		Primi: 46.34% Multi: 53.66%
Baby status	Baby with mother 89.74%	Baby in NICU 10.25%	IUFD -	NICU: 36.585% BWM: 63.415%
Mode of delivery	FTND 12.82%	LSCS 87.17%	PTVgD -	FTND: 51.22% LSCS: 48.78%
Period of gestation	Postdated 20.51%	Term 61.53%	Pre-term 17.94%	Postdated:8.64 Term: 50.61 Preterm: 40.74

Oligohydramnios was found to be more prevalent among Multigravidas in ours as well as in the study done by Veena Vidyasagar et al. 10.25% of the babies were admitted in the NICU with 50% of them admitted for post-resuscitation care, followed by low birth weight and respiratory distress. In our study 61.53% were term deliveries, 20.51% were postdated, and 17.94% were preterm. 87.17% of them underwent LSCS for safe confinement; the rest were full-term vaginal deliveries.

Whereas in the study by Veena Vidyasagar et al. 50.61 were term patients, 40.74% preterm, 8.64% postdated, termination by LSCS was done in 48.78% cases while the rest delivered vaginally eventually 36.585% babies were admitted in NICU, with 9.76% perinatal mortality rate.

d) *Polyhydramnios*

				Aditi Rajgire et al[5]
Parity	Primigravida 14.28%	Multigravida 85.71%		
Baby status	Baby with mother 85.71%	Baby in NICU -	IUFD 14.28%	IUFD 5%
Mode of delivery	FTND 14.28%	LSCS 57.14%	PTVgD 28.57%	
Period of gestation	Postdated 14.28%	Term 42.85%	Pre-term 42.85%	

Polyhydramnios was found to be more prevalent among multigravidas. An equal proportion of patients had delivered at term and at preterm. 87.71% of the babies had an uneventful delivery with no baby admitted in the NICU as per this study. 14.28% of the pregnancies resulted in IUFDs. 57.14% underwent LSCS, 28.57 % had PTVgDs and 14.28% underwent vaginal delivery.

e) *Previous LSCS*

				Nigamnanda et al[6]
Order of previous LSCS	Previous 1 LSCS 83.80%	Previous 2 LSCS 16.19%		
Baby status	Baby with mother 92.38%	Baby in NICU 6.66%	IUFD 0.95%	
Mode of delivery	VBAC 9.52%	LSCS 90.47%		LSCS: 84% VBAC: 16%
Period of gestation	Postdated 11.42%	Term 72.38%	Pre-term 16.19%	

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In this study, of all the patients who were a case of previous LSCS, 83.80% of them were previous 1 LSCS, and the rest were previous 2 LSCS. The majority of them were subjected to LSCS in their present conception, and only 9.52% delivered by VBAC (vaginal birth following caesarean section).In a study done by Nagamnand et al. although a trial of labour was given, VBAC was successful only in 16%, and 84% women underwent LSCS.

According to the study done in our hospital 6.66% of the babies were admitted in the NICU with fetal respiratory distress is the most common cause for the same accounting for 42.85% of the total, followed by PROM > 18 hrs (28.57%), ELBW + extreme preterm (14.28%) and for HGT monitoring (14.28%). 0.95% was the IUFD rate in the case of previous LSCS.

f) Gestational Diabetes Mellitus

				K Manga Reddy et al[7]
Parity	Primigravida	Multigravida 100%		Primi 40.8% Multi 59.1%
Baby status	Baby with mother 60%	Baby in NICU 40%	IUFD -	Baby in NICU 76%
Mode of delivery	FTND -	LSCS 100%	PTVgD -	VD 38% LSCS 62%
Period of gestation	Postdated 20%	Term 60%	Pre-term 20%	

In this study, all the patients with GDM were found to be multigravidas, and all of them underwent LSCS. 40% of the babies born to GDM mothers were admitted to NICU for HGT monitoring. 60% of them went to term, and 20% of them were postdated and preterm each.

g) Anemia

				Shraddha S Maka et al[8]
Parity	Primigravida 45.45%	Multigravida 54.54%		Primigravida 37% Multigravida 63%
Baby status	Baby with mother 72.72%	Baby in NICU 27.27%	IUFD -	Baby in NICU 25% IUFD 3%
Mode of delivery	FTND 72.72%	LSCS 18.18%	PTVgD 9.09%	
Period of gestation	Postdated 27.27%	Term 63.63%	Pre-term 9.09%	

Anemia is more prevalent among multigravidas. 27.27% of the babies were admitted in NICU, of which respiratory distress accounted for 66.66% of the NICU admissions and LBW with severe birth asphyxia accounting for the rest of the cases. Most of the patients underwent Full term vaginal delivery (72.72%), 18.18% of patients underwnt LSCS and the remaining were preterm vaginal deliveries. Maximum patients delivered at term, and *36.36% of the patients were given a blood transfusion.*

h) Intrauterine Fetal Death

				Anand Karale et al[9]
Parity	Primigravida 35.71%	Multigravida 64.28%		Primi: 43% Multi: 57%
Type of IUFD	MSB 57.14%	FSB 28.57%	Spontaneous Abortion 14.28%	Maceration present: 49.4% No signs of maceration: 50.6%
Mode of delivery	FTVgD 7.14%	LSCS 14.28%	PTVgD 78.57%	LSCS:5.1% Vaginal: 94.9%
Period of gestation	Postdated -	Term 7.14%	Pre-term 92.85%	Term: 12.7 % Preterm: 87.3%

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Intra-uterine fetal deaths were more prevalent among multigravidas (64.28%). Maximum patients delivered before term (92.85%) with only 7.14% of term deliveries. 78.57% were PTVgDs, 14.28% underwent LSCS and 7.14% underwent FTVgD. The most common type of IUFD was MSB (macerated still-birth), with 28.57% of FSB (fresh still-birth) and 14.28% of spontaneous abortions. *28.57% of the still-births were found to be associated with PIH.*

i) Breech Presentation

				Bushra Rauf et al (2000)[10]
Parity	Primigravida 59.09%	Multigravida 40.90%		Primigravida 24.9% Multigravida 75%
Baby status	Baby with mother 86.36%	Baby in NICU 13.63%	IUFD -	IUFD: 4.9%
Mode of delivery	FTND 13.63%	LSCS 86.36%	PTVgD -	VD 55.8% LSCS 44.4%
Period of gestation	Postdated 9.09%	Term 72.72%	Pre-term 18.18%	Term: 4.7% 29-32 weeks: 14%

The breech presentation was found to be prevalent among Primigravidas in our study, but contrary to it in the study done by Bushra et al. breech was more common in multigravida(75%) . The outcome of maximum pregnancies was uneventful, with only 13.63% of babies admitted in NICU of which LBW with preterm being the most common cause followed by the need for post-resuscitation care. 72.72% of the pregnancies went up to term, followed by preterm and postdated deliveries respectively, but in the study by Bushra et al. only 4.7 % breech were full-term , 14% between 29-32 wks and maximum were pre-term. LSCS was the most common mode of delivery (86.36%) in our institution, although in the comparative study vaginal delivery was more common, probably in view of, preterm breech presented in their study. The major cause of LSCS in their study was fetal distress followed by failure to progress.

j) Antepartum Hemorrhage

				Siddhartha Majumder et al (2015)[11]
Parity	Primigravida 50%	Multigravida 50%		Primi: 18% Multi: 82%
Baby status	Baby with mother 100%	Baby in NICU -	IUFD -	Perinatal mortality PP: 12.1% Abruptio placentae: 44.1%
Mode of delivery	FTND 12.50%	LSCS 75%	PTVgD 12.50%	LSCS: 85% (LSCS: IN PP: 100% Abruptio placentae:55.8%)
Period of gestation	Term 75%	Pre-term 25%		Term: 17% Preterm: 83%

Antepartum hemorrhage was found to be equally prevalent among primigravidas and multigravidas in our institution, but in the study by Siddhartha Mujemdar it was high-risk-risker in multigravidas in incidence (82%) Our study showed that there were no NICU admission and no IUFDs.

Where in, the study by Mujemdar et al. showed Perinatal mortality of 12.1% in placenta previa and 44.1% in Abruptio placentae. At our institute LSCS was the most prevalent mode of delivery (75%) followed by FTND and PTVgD similar to the study done by Mujemdar et al. in which the LSCS rate was 85% although all of placenta previa cases were delivered by LSCS and 44.2%v of abruption placentae delivered vaginally. Contrary to our study in which Three-fourth of the pregnancies went up-to term and one-fourth had to be terminated at preterm, the other study showed the incidence of APH to be high-risk-risker in preterm (83%).

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k) Multiple Gestation

				Amiben Gajera et al (2015)[12]
Parity	Primigravida 44.44%	Multigravida 55.55%		Primi: 34% Multi: 66%
Baby status	Baby with mother 66.66%	Baby in NICU 33.33%	IUFD -	NICU: 26.5 % Both IUD: 6% Single IUD:4.5%
Mode of delivery	FTND 33.33%	LSCS 33.33%	PTVgD 33.33%	VD: 56% LSCS: 39%
Period of gestation	Term 66.66%	Pre-term 33.33%		Term: 26% Preterm: 64% < 28 weeks: 10%

This study showed that multiple gestations were more prevalent among multigravidas, with 66.66% reaching term and the rest being terminated pre-term. Similarly, in the study done by Amiben Gajera et al. in 2015, Twin gestation was more in multigravidas,but contrary to our study only 26% reached full term while 64% delivered prematurely and a stand out of 10% were of <28 weeks of gestation. Regarding the perinatal outcome, 33.33% babies admitted in NICU, with respiratory distress being the most common cause followed by LBW for NICU admission. Mode of delivery was equally distributed among FTND, LSCS and, PTVgD in our study.

III. Summary

PIH: PIH was more prevalent in Primigravida, more common mode of delivery was LSCS and significant rate of PTVgD (11.76%) In our institution 15.68% of the babies born were admitted in the NICU for indications like Respiratory distress (87.5%) 5.88% of the pregnancies resulted in Intrauterine fetal demise in contrast to 9% IUFD and 2.72% obstetric hysterectomy in the study compared, *1 patient with a vaginally delivered IUFD underwent Obstetric hysterectomy i/v/o liver capsular hematoma.*

PROM: Premature rupture of membranes was found to be more prevalent among Primigravida (50.66%) and, 18.66% of the babies were admitted in the NICU with the indication of prolonged PROM (>18 hrs) being the most common, while FTND was found to be the common mode of delivery overall, and no neonatal mortality was associated with PROM.

Oligohydramnios: More prevalent among Multigravidas, 0.51% were postdated and, 17.94% were preterm. 87.17% of them underwent LSCS, whereas in the study compared termination by LSCS was done in 48.78% cases, Eventually 36.585% babies were admitted in NICU, with 9.76% perinatal mortality rate which wasn't the case in our institute with 10.25% NICU admissions and no neonatal mortality associated.

Polyhydramnios: It can be said that Polyhydramnios have been studied at a lower rate as high-risk compared to others. In our institute, it was seen more commonly in multigravidas, with equal incidence of term and preterm delivery (42% each). Polyhydramnios associated with IUFD was seen in 14% cases in our institute in contrast to 5% IUFD in the study compared.

GDM: At our institute, all mothers with GDM were Multigravida and, the choice of mode of delivery was LSCS in all of them with 40 % NICU admissions for HGT monitoring as compared to 76 5 NICU admissions in the study compared.

Anemia: As mentioned in literature, both the studies show anemia being prevalent in multigravidas and the choice of mode of delivery being Vaginal delivery.
IUFD: In patients with IUFD Preterm Delivery rates were high-risk at our centre with the rate of MSB almost double than that of FSB, which was equal in the study compared. LSCS was the least opted mode of delivery at the both places.

Breech presentation: AT our center, the breech presentation in a primigravida was more prevalent, resulting in delivery by LSCS in contrast to the study compared, which has more incidence of multigravida presenting with the breech in preterm labor and resulting into vaginal delivery.

Antepartum Heamorrhage:

APH incidence was equal in both multi and primigravida with the preferred mode of delivery being an emergency LSCS resulting in no NICU admissions at our center, whereas in the study compared mode of delivery was LSCS bu incidence was high-risk among multigravidas and resulted in increased NICU admissions and perinatal mortality & morbidity.

Multiple gestations is seen more commonly seen in multigravidas, with nn equal rate of delivery by FTVD, LSCS and Preterm delivery.

Hence it is evidently seen that the fetomaternal outcomes in various High-Risk Pregnancies were

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comparable and if can be said, were better at our institution, as compared to various individual studies done for the individual risk factors at different places.

IV. Conclusion

Our study is a retrospective study done at a tertiary care hospital in Mumbai, Maharashtra inclusive of 346 cases to assess fetomaternal outcomes in various High-Risk Pregnancies enrolled at our hospital. High-risk pregnancies included hypertension in pregnancy, PROM, Amniotic fluid diseases, Gestational Diabetes Mellitus, Anemia, IUFD, breech presentation, Multiple gestation and, APH. It can be said that the results for each of the high-risk states at tertiary care institutions are equivalent with a freedom to choose the appropriate method of termination and medical and surgical expertise and NICU facilities aiding to improved fetomaternal outcomes, proving the importance and evident good outcomes at a tertiary care center.

Of all the high-risk cases observed in this study only one was associated with maternal mortality, which stands out the critical role played by the modular infrastructure, expertise and facilities offered at a tertiary care centre, such as continuous NST monitoring, monitoring of fetomaternal well being, availability of expert obstetricians and anaesthesia - medicine team, availability of emergency interventions and medicines, well equipped operation theatre and post-operative and post-delivery monitoring, NICU and ventilator availability. All these facilities account to safe delivery and good health of both mother and the neonate with adequate care.

At any concerned center to have a good fetomaternal outcome it is essential to have a keen eye to pick out high-risk cases at the earliest on the OPD basis, cater to the required investigations and close follow up or in-patient admissions if required and essential active medical management at the minimal. Lastly but not least, a very vigilant labor monitoring is required to decide on a mode of delivery, to assess fetal well being and, to provide to the required care.

Limitations

The primary limitation of the study was that, since it was conducted in a tertiary-care hospital set-up, the number of high-risk cases maybe more, and it may not truly reflect the prevailing situation in a community setting.

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Peripartum Cardiomyopathy- A Case Series Report in a Tertiery Hospital in Pondicherry for Two Years

By Dr. Shyamala, Dr. Nina Kate & Dr. P. Sujatha

Abstract- Peripartum Cardiomyopathy, a type of dilated cardiomyopathy, is a rare entity with increasing trend. The aetiology and pathogenesis of peripartum cardiomyopathy are still unknown. Although the mortality and morbidity rates are high, recognising this condition earlier and treating it with multidisciplinary approach has brought out a better outcome. We, hereby are reporting a case series of eight cases of peripartum cardiomyopathy reported in our hospital and their clinical presentation, echocardiography findings and their subsequent follow up.

GJMR-E Classification: *NLMC Code: WP 660*

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Peripartum Cardiomyopathy- A Case Series Report in a Tertiery Hospital in Pondicherry for Two Years

Dr. Shyamala [α], Dr. Nina Kate [σ] & Dr. P. Sujatha [ρ]

Abstract- **Peripartum Cardiomyopathy, a type of dilated cardiomyopathy, is a rare entity with increasing trend. The aetiology and pathogenesis of peripartum cardiomyopathy are still unknown. Although the mortality and morbidity rates are high, recognising this condition earlier and treating it with multidisciplinary approach has brought out a better outcome. We, hereby are reporting a case series of eight cases of peripartum cardiomyopathy reported in our hospital and their clinical presentation, echocardiography findings and their subsequent follow up.**

I. Introduction

Peripartum Cardiomyopathy (PPCM) is an idiopathic cardiomyopathy that presents in the last month of pregnancy up to five months of delivery as heart failure secondary to left ventricular systolic dysfunction in the absence of another cause of heart failure.[1]It was first described as early as 1800, yet its aetiology is still unclear.[2] The incidence of PPCM varies in different population. It has been reported to occur in varying rates ranging from 1 in 15,000 in United states to 1 in 100 in a small region in Sub-Saharan Africa.[3] Incidence in India has not been reported.

We present a case series report of eight cases reported in our hospital over a time span of two years.

II. Materials and Methods

A retrospective study was done at Rajiv Gandhi Government Women and Children Hospital, Pondicherry from 2017-2018. Files of the patients diagnosed with PPCM were reviewed and analysed.

The definition criteria[4] used for PPCM included:

- Heart failure in the last month of pregnancy and up to five months postpartum
- Absence of identifiable causes of heart failure
- Absence of recognisable heart failure before last month of pregnancy.
- Additional criteria included left ventricular systolic dysfunction characterised by echocardiogram finding such as depressed shortening fraction (< 30%), ejection fraction(less than 45%) and a left ventricular end diastolic dimension of more than 2.7cm/m^2 of body surface area.

Clinical data of the patients including the age, parity, gestational age, identifiable risk factors and clinical presentation were noted. ECHO findings were noted. Treatment given to the various patients in form of diuretics, ion tropes and ventilatory support were compared. The patients were then followed up and echocardiography was repeated after 6 months of delivery and the findings were noted.

III. Results

The demographic details, clinical presentation and management of the patients included in our study were analysed. It was observed that the mean age of incidence among the patients was 28+/-2 years.

The incidence of Peripartum Cardiomyopathy among primiparous was 50% (n=4) showing that there was equal distribution of PPCM among primi and multiparous women.

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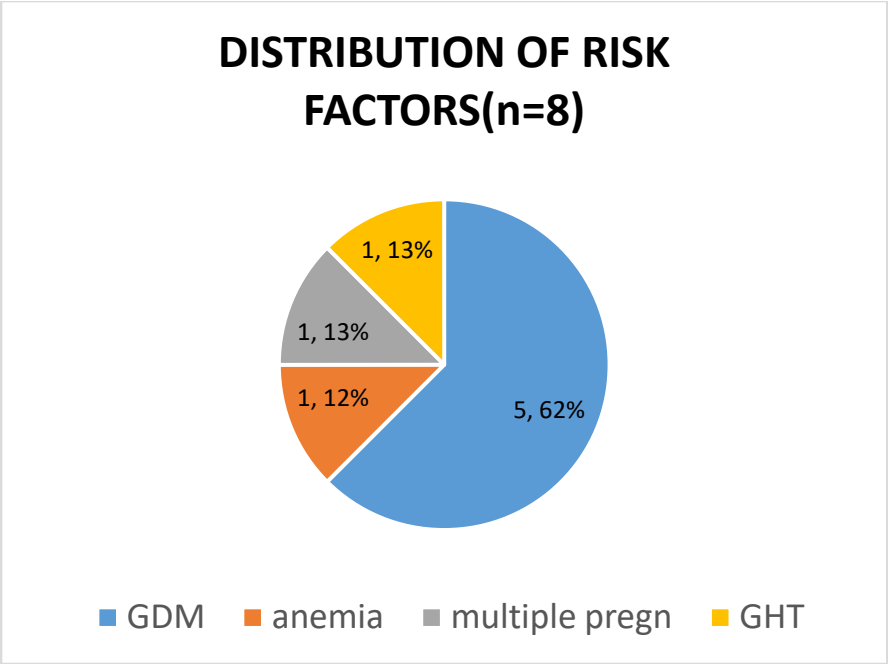

Figure 1: Risk factor profile in our case series of patients with PPCM

As seen in the pie diagram, it is evident that the incidence of Gestational diabetes (GDM) among patients with PPCM was 62% (n=5) of cases. The other risk factors observed were anemia, multiple pregnancy and gestational hypertension each contributing to 13% of the cases.

All the patients had an acute onset of symptoms with the peak incidence being within 24 hours of delivery amounting to 37.5% (n=3) of the cases. Only one patient presented in the antenatal period.

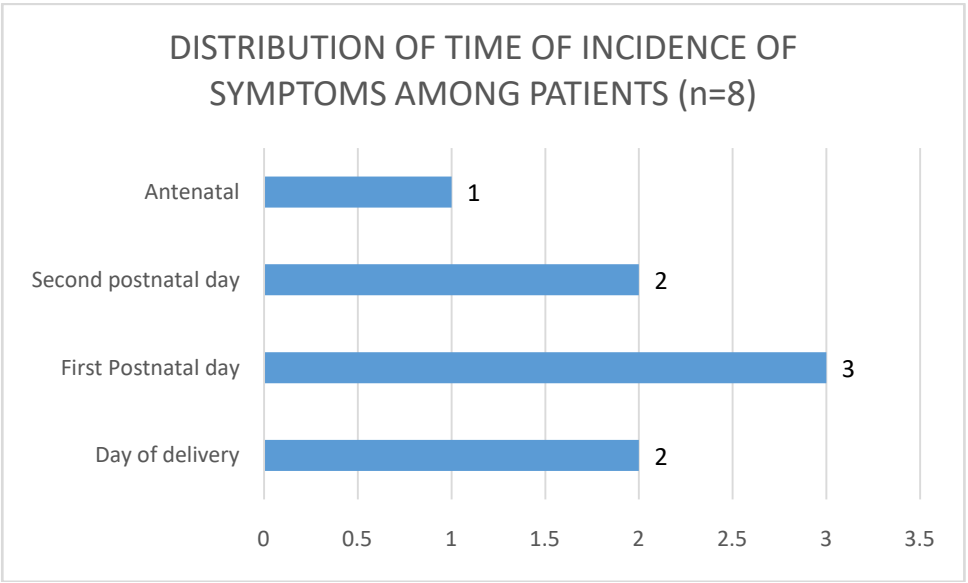

Figure 2: Time of presentation of PPCM

Dyspnoea was the presenting complaint in half of the cases. Saturation drop was recorded in three-fourth of cases.

The diagnosis was based on ECHO finding showing a fall in ejection fraction below 45%. Significant mitral regurgitation was noted in half the cases. The treatment given was mainly supportive which included ventilator support, ion tropes and diuretics. Ventilator support was needed in three out of eight cases.

The patients were followed up to six months postpartum. ECHO was repeated for all the patients and was compared with the initial ECHO findings.

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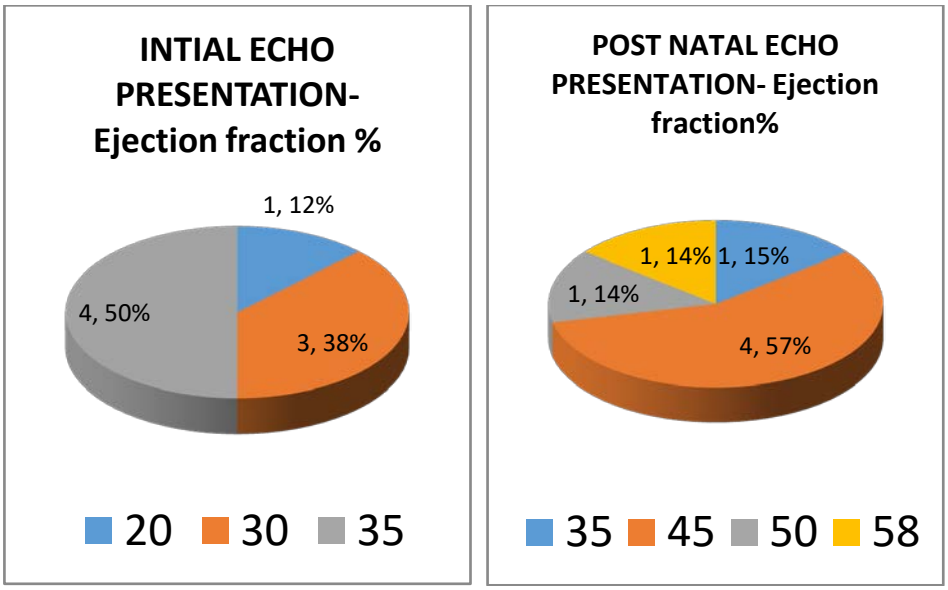

Figure 3: Comparison of the initial ejection fraction with the follow up ejection fraction

It was observed that 50% (n=4) of the patients had an initial ejection fraction of 35% and 38% (n=3) of the patients had an initial ejection fraction of 30%. Only one patient had an ejection fraction of 20% which was the only case that eventually culminated in maternal mortality.

On follow-up ECHO, it was noted that 7 among 8 patients (85%) had an ejection fraction of >45% and only one patient had an ejection fraction of 35%. It was noted that the patient with follow up ejection fraction 35% had an initial ejection fraction of 30%.This highlights the importance of initial ejection fraction showing that patients with better ejection fraction at the initial presentation recovered well. As the rate of recurrence in subsequent pregnancy is high, we advised the patients to avoid further conception.

IV. Discussion

The mean age of incidence of PPCM in our present study was 28+/-2 years. Similarly, in a study conducted by Amos[5] et al the mean age of incidence was 29 years. Chapa[6] et al and Vettori[7] et al also reported a lower age of incidence of 27 years. Elakayam[8] et al reported a mean age of 29 years. In a study conducted by Kolte[9] et al, it was noted that the mean age of incidence was higher averaging 30.8+/-7.1 years. Similarly a study conducted by Hasan[10] et al also showed a higher age of incidence amounting to 32 years. Asad[11] et al reported a mean age of 27-32 years.

Table 1: Mean age of incidence of PPCM in various studies

Study	Mean Age of Incidence of Ppcm in Years
Present study	28+/-2
Amos[5] et al	29
Chapa[6] et al	27
Vettori[7] et al	27
Elakayam[8] et al	29
Kolte[9] et al	30.8+/-7.1
Hasan[10] et al	32

In our study, there was equal distribution among primiparous and multiparous women. This is in contrast with many studies including Fett[12] et al who in their study on the incidence of peripartum cardiomyopathy had concluded that there was an increase in the incidence of PPCM with increasing age and increasing parity.

On analysing the risk factor profile of the patients, it was observed that in our study the incidence of Gestational Hypertension was 13% (Fig 1). Chapa[6] et al reported a low incidence of 16% in their study. Kolte[9] et al reported a higher incidence of 59.6% in their study. Similarly, Vettori[7] et al (50%), Amos[5] et al (45%) and Elakayam[8] et al (43%) also reported a high incidence of Gestational Hypertension among patients with PPCM.

Table 2: Incidence of GHT among patients with PPCM in various study groups

Study	Incidence of GHT in Patients with PPCM in Percentage
Present	13%
Chapa[6] et al	16%
Kolte[9] et al	59.6%
Vettori[7] et al	50%
Amos[5] et al	45%
Elakayam[8] et al	43%

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In our study, Gestational Diabetes was a major contributor amounting to 62% of cases as shown in figure 1. In study conducted by Kolte[9] et al, a lesser incidence of GDM among patients with PPCM amounting to 18.2%.

The incidence of multiple pregnancy in patients with PPCM was 13% in our present study (Fig 1). A similar incidence rate of 13% was reported in studies conducted by Chapa[6] et al and Elakayam[8] et al. A slightly higher rate of 17% was reported in a study conducted by Vettori[7] et al. In a study conducted by Kolte[9] et al, it was noted that the incidence of multiple pregnancy in patients with PPCM was 6.2%.

In our present study, the incidence of anaemia among patients with PPCM was 12%. A higher rate of 30.5% was reported in a study conducted by Kolte[9] et al. The variation in the distribution of risk factors among patients with PPCM can be explained by the fact that our study was conducted in Southern India while other studies were conducted elsewhere.

In our present study, the diagnosis was made within 24 hours of delivery in 37.5% of cases (Fig 2). This correlates with the finding of the study by GowriSayi Prasad[13] et al who found out that 11 out of 16 cases in their study presented in the first postnatal day.

V. Add on Points on PPCM

Peripartum Cardiomyopathy is a rare condition recently on raising incidence with high maternal mortality and morbidity[14]. The incidence varies widely in different population.

It is characterised by left ventricular systolic dysfunction occurring in the last months of pregnancy or in the post natal period in the absence of other causes of heart failure. The aetiology is still unclear and many theories have been postulated. Genetic basis for the diseases has been proposed in several studies[15].

The diagnosis is based on clinical suspicion and echocardiogram. The main drawback in the diagnosis is that symptoms of heart failure may be confused with the symptoms of normal pregnancy which may cause a delay in diagnosis and hence a delay in the start of treatment. The Centre for Maternal and Child Enquiries has suggested that " women in late pregnancy or within 6 months of delivery with symptoms of breathlessness, orthopnea, and signs of tachycardia and tachypnea may have PPCM and investigation with chest X- ray and echocardiogram are indicated"[16].

The management of patients with PPCM should be individualised. Management strategies should be dictated as to the fact whether the patient is pregnant or post partum as certain drugs are to be avoided in pregnant women[17]. Beta blockers can be used safely in pregnancy, while ACE inhibitors, ARB and aldosterone antagonist should be avoided. Diuretics should be used in caution as it can affect uteroplacental circulation.

Bromocriptine may be a novel disease-specific treatment for PPCM [18].Several case reports have suggested that the addition of bromocriptine to standard therapy for HF may be beneficial in patients with acute onset of PPCM. In addition, a proof-of-concept randomized pilot study of patients with newly diagnosed PPCM presenting within 4 weeks of delivery also showed promising results. Patients receiving bromocriptine 2.5 mg twice daily for 2 weeks, followed by 2.5 mg daily for 4 weeks, displayed greater recovery of LVEF compared with patients assigned to standard care. However, the use of bromocriptine has been found to be associated with incidence of acute myocardial infarction[19]. Hence it should be used with anti coagulants.

Women with PPCM should have a multi-speciality care. Unless there is deteriotion in maternal condition, there is no need for urgent delivery[20]. The primary consideration is maternal hemodynamic stability. Labour natural is the preferred mode of delivery[21]. Continuous electronic foetal monitoring is recommended. Left lateral position of the mother is preferred to prevent supine hypotension[22]. Epidural analgesia should be administered[20]. During caesarean section, spinal or combined epidural- spinal anaesthesia is preferred. Second stage of labour should be cut short. Active management of third stage of labour is a must. Breast feeding is not advised as prolactin sub fragments are suspected to have a role in PPCM.

PPCM is known to have high maternal mortality, ranging from 15-50%[3]. Timely diagnosis and critical care support has found to reduce the mortality rate.

Elkayam[8] et al studied 44 women with PPCM and a subsequent pregnancy and found that LVEF increased after the index pregnancy but decreased again during the subsequent pregnancy, irrespective of earlier values. Development of HF symptoms was more frequent in the group where LEVF had not normalized before the subsequent pregnancy. Hence patients with PPCM in index pregnancy should be properly counselled and should have an ECHO done before the next pregnancy.

Upcoming researches on PPCM

A genomic association has been proposed as aetiology for PPCM. There has been shown to be a familial concordance of PPCM, however it can be a simple presentation of familial dilated cardiomyopathy[15]. There has been a proposal of association between gene 12 and incidence of PPCM[23].

A study conducted on mice has shown that prolactin cleavage causes impairment of cardio myocyte function due to anti-angiogenic and pro-apoptotic properties. This effect has been showed to be completely reversed by administration of bromocriptine. This finding may hold therapeutic promise in humans[24].

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Antibodies directed against cardiac tissues have been found in PPCM patients, though it remains unclear whether it is a causative factor or it occurs after destruction of myocytes by another mechanism[25].

VI. Conclusion

Peripartum cardiomyopathy is a rare entity but has high mortality rates. Hence cases presenting with features of heart failure should be treated with high suspicion. Prompt diagnosis and treatment is crucial for a better outcome. Proper counselling should be given to the patients regarding subsequent pregnancy.

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4 Minutes Rule in Perimortem Caesarean Delivery: Does it Still Relevant? Case Series

By Abdul Karim Othman, Mohd Nazri Ali, Wan Nasrudin Wan Ismail,
Nurul Aimi Mustaffa & Mohd Habibullah Zakaria

Abstract- *Objective:* To highlight the importance of immediate initiation of perimortem caesarean delivery in maternal with sudden cardiac arrest.

Case report: We reported the outcomes of three cases of perimortem caesarean delivery secondary to maternal cardiac arrest. A 28-year-old G3P2 at 36 weeks of gestation who developed severe hypoxaemia secondary to acute pulmonary oedema which was arise from pre-eclampsia related hypertensive crisis.The second case was a 29-year-old G1P0 at 38 weeks of gestation who developed severe hypoxaemia secondary to spinal anaesthesia complication (total spinal)and the third case was a 44-year-old G5P4 at 39 weeks of gestation who developed severe hypoxaemia secondary to failed intubation and ventilation during induction of anaesthesia. Observing the outcomes of the three maternal after post perimortem caesarean delivery, we are strongly agreed that the time from maternal cardiac arrest to the initiation of resuscitative hysterotomy should be shifted from 4 minute to immediately.

Conclusion: Preparations for perimortem caesarean delivery should be made simultaneously with the initiation of maternal resuscitative efforts.

Keywords: *perimortem caesarean delivery, resuscitative hysterotomy, maternal cardiac arrest.*

GJMR-E Classification: *NLMC Code: WP 660*

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4 Minutes Rule in Perimortem Caesarean Delivery: Does it Still Relevant? Case Series

Abdul Karim Othman [α], Mohd Nazri Ali [σ], Wan Nasrudin Wan Ismail [ρ], Nurul Aimi Mustaffa [ω] & Mohd Habibullah Zakaria [¥]

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I. Introduction

Perimortem caesarean delivery (PMCD), or so called resuscitative hysterotomy is a hysterotomy procedure performed to resuscitate a maternal in the middle or late period of gestations who has entered cardiac arrest for any reason. This procedure is recommended to be initiated for two important reasons that is to maximize the maternal response to resuscitation during cardiopulmonary resuscitation and to save the life of the viable foetus. The theory behind perimortem caesarean delivery procedure is that effective cardiopulmonary resuscitation is extremely difficult in maternal at middle to late period of gestations due to the gravid uterus. It was reported that the chest compression in a maternal with a gravid uterus will only leads in the best of circumstances to a cardiac output of 10% of the normal cardiac output[1]. Therefore, by emptying the gravid uterus early enough and with the support of high-quality cardiopulmonary resuscitation, we believe that the outcome of the arrested maternal and the viable foetus will be improved significantly and probably we can reduce the neurological damage to the survived maternal.

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II. Cases

Case 1.

A 28 years old G3P2 at 36 weeks of gestation developed severe hypoxaemia secondary to acute pulmonary oedema which was arise from pre-eclampsia related hypertensive crisis. As the patient developed cardiac arrest, perimortem caesarean delivery was attempted after failed to regain the return of spontaneous circulation (ROSC) despite 10 minutes duration of high-quality cardiopulmonary resuscitation. The baby was discharged home at Day 3 of life with no neurological deficit. The mother was discharged home with no neurological deficit on the 25th day of PMCD having an occipital lacunar infarct.

Case 2.

A 27 years old G1P0 at 39 weeks of gestation with maternal obesity (BMI of 32kg/m^2) developed severe hypoxaemia secondary to spinal anaesthesia complication (total spinal). As the patient developed cardiac arrest, perimortem caesarean delivery was attempted after failed to regain the return of spontaneous circulation (ROSC) despite 10 minutes duration of high-quality cardiopulmonary resuscitation. The baby was discharged home at Day 3 of life with no neurological deficit. However, the mother was discharged home on the 198th day of PMCD with severe neurological deficit secondary to global hypoxic ischaemic brain injury.

Case 3.

A 42 years old G5P4 at 38 weeks of gestation with gestational diabetes and one previous caesarean delivery developed severe hypoxaemia secondary to failed ventilation and intubation during induction of anaesthesia. As the patient developed cardiac arrest, perimortem caesarean delivery was attempted after failed to regain the return of spontaneous circulation (ROSC) despite 3 minutes duration of high-quality cardiopulmonary resuscitation. The baby was discharged home with no neurological deficit. However, the mother was discharged home on the 44th day of PMCD with a severe neurological deficit secondary to global hypoxic ischaemic brain injury.

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In Table 1we describe the durations (in minutes) for each significant step from the time of maternal cardiac arrest to the initiation of perimortem caesarean delivery and duration for achieving the return of spontaneous circulation to the arrested maternal.

Table 1: Duration (minutes) for each step during Perimortem Caesarean Delivery until ROSC

	Case1	Case 2	Case 3
Location of cardiac arrest	Operation theatre	Operation theatre	Operation theatre
Durationfrom cardiac arrest to initiation of CPR	Immediate	3 minutes	Immediate
Duration from CPR to initiation of PMCD	10 minutes	10 minutes	3 minutes
Duration from skin incision to delivery of the foetus	Less than 3 minutes	10 minutes	7 minutes
Duration from delivery of the foetus to maternal ROSC	Less than 2 minutes	Less than 2 minutes	5 minutes
Total duration from cardiac arrest to ROSC	15 minutes	15 minutes	25 minutes

III. Discussion

4-minutes rule in perimortem caesarean delivery requested that the resuscitative hysterotomy procedure should be initiated within 4 minutes of maternal cardiopulmonary arrest if the resuscitative efforts were unsuccessful [2]. This is due to the traditional believed that adults begin experiencing anoxic brain damage 4 to 6 minutes into a cardiac arrest. However, this assumption has raised an important immediate question especially in resuscitating pregnant women in the late period of gestations.

Pregnant women in the third trimester are actually not very comparable to "adults" in the physiology of resuscitation: high oxygen consumption with overall high metabolic rate, reduced oxygen reserve with faster tendency to develop hypercapnia and hypoxaemia, high percentage of cardiac output being directed to the uteroplacental circulation[3] and these factors are further aggravated by a significant reduced efficacy of chest compressions during cardiopulmonary resuscitation and completely obstructed vena cava by the gravid uterus. Therefore, the four-minutes rule cut-off for anoxic brain injury may not be applicable to this population as it is applying to non-pregnant patients. We would expect that pregnant women with gravid uterus to be even more susceptible to oxygen deprivation than the non-pregnant adults who experienced ischemic brain injury in as early as 4 minutes. Furthermore, there is a major hemodynamic fluid shifts occur at birth including a significant increase in venous return following the relief of the vena cava compressions, and redirection of the circulating blood from the uterine to the systemic circulation[4].

Looking at the outcome of the maternal in our case series, we are strongly agreed with Rose et al which suggest that if the uterus is palpable at or above the umbilicus, preparations for delivery should be made simultaneously with the initiation of maternal resuscitative efforts; and if maternal condition is not rapidly reversible, resuscitative hysterotomy with delivery should be performed regardless of foetal viability or elapsed time since maternal cardiac arrest[5]. In addition to this, it is important to note that of all the reversible causes cited for maternal cardiac arrest by the American Heart Association, many are absolute indications for prompt delivery of the fetal[6].

IV. Conclusion

The decision to resuscitative hysterotomy should be made around the cardiac arrest, and it's should not be delayed, as both maternal and foetal chances of survival are expected to decline significantly with time and therefore, the time from maternal cardiac arrest to initiation of resuscitative hysterotomy should be shifted from 4 minute to immediately.

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Compliance with ethics guidelines

Abdul Karim Othman, Mohd Nazri Ali, Wan Nasrudin Wan Ismail, Nurul Aimi Mustaffa and Mohd Habibullah Zakaria declare that they have no conflict of interest. Patient anonymity was preserved, and this article does not contain any studies with animal subjects performed by any of the authors.

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Clinical Presentation of Bacterial Vaginosis During Labour

By Lakshmi Subburaj, Seetha Panicker & Raj Kumar

Abstract- *Background:* Presence of bacterial vaginosis in pregnancy and labour has potential risks. There is an increased risk for preterm delivery, in addition to progression of vaginosis to vaginitis and cervicitis. The steady progression of inflammation often affects the fetus, resulting in chorioamnionitis and premature rupture of membranes. This study was carried out to evaluate the prevalence and impact of bacterial vaginosis among pregnant women.

Methods: This cross sectional study was carried out among 106 pregnant women who were admitted in labour in our facility. Vaginal pH was determined by swabbing the lateral and posterior fornices of the vagina, and the swab was directly placed on the litmus paper to determine the pH. Whiff's test was performed. Gram stain was carried out and diagnosis of Bacterial Vaginosis was made based on Nugent's criteria.

Results: The prevalence of Bacterial vaginosis based on Nugent's criteria was 16.04%. There was a statistically significant association between Bacterial Vaginosis and preterm labour ($p<0.05$) and also between Bacterial Vaginosis and low birth weight, with a mean birth weight of 2100 grams among participants with BV compared to 3210 grams among normal pregnant mothers ($p<0.05$).

Conclusion: Diagnosis of bacterial vaginosis is possible by early detection and thereby prevention of preterm labour by treatment is possible which would play a great role in significant reductions in the preterm birth and its adverse sequelae.

Keywords: *bacterial vaginosis, lactobacillus, whiff's test, clue cells, preterm labour, low birth weight.*

GJMR-E Classification: *NLMC Code: WJ 190*

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I. Introduction

The adult vagina normally contains bacteria as a part of normal vaginal flora. The most common bacteria include Lactobacillus species, alpha hemolytic streptococci and Clostridia species. These bacteria help in maintaining the normal pH of the vagina and also prevent the growth of other potential pathogens. [1] An imbalance in the normal vaginal bacteria can result in increased production of anaerobic bacteria, and this condition is termed as bacterial vaginosis.[2] Bacterial vaginosis (BV) is the most common cause of vaginal symptoms in pregnant women, affecting upto 35% of the pregnant women in developing countries like India.[3] Poor socioeconomic conditions, illiteracy and poor personal hygiene are some of the factors which are responsible for high prevalence rates in India.

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Bacterial Vaginosis results in polymicrobial alteration of the vaginal flora thereby increasing the vaginal pH to >4.5. In some cases, BV is associated with homogenous discharge, however, absence of demonstratable inflammatory response makes the clinical management more challenging. The commonly used diagnostic tools include estimation of vaginal pH, gram staining, Whiff's test and detection of clue cells. However, with increasing prevalence of strains resistant to metronidazole, newer techniques like Polymerase Chain Reaction (PCR) based detection of rRNA genes are being employed for both diagnosis and prognosis.[4]

Presence of bacterial vaginosis in pregnancy and labour has potential risks. There is an increased risk for preterm delivery, in addition to progression of vaginosis to vaginitis and cervicitis. The steady progression of inflammation often affects the fetus, resulting in chorioamnionitis and premature rupture of membranes. In severe, undetected cases, BV can result in intrauterine death. Although several studies in India have reported the prevalence of BV, very few studies have documented its impact, especially in the rural setting of South India. A hospital based evaluation of the magnitude and burden of BV is essential for planning preventive and curative strategies at the population level.

II. Objectives

This study was carried out to

- Estimate the prevalence of BV in asymptomatic pregnant women
- Evaluate the complications of BV on pregnancy and labour

III. Methodology

a) Study setting and participants

This study was carried out as cross sectional study for a period of 11 months between January to November 2013 among the pregnant women admitted to our facility at the time of labour.

b) Selection and sampling

All the pregnant women admitted with onset of labour during the study period were taken up for the study. Women with premature rupture of membranes were excluded. Based on intensive literature review, the prevalence of BV in a study done in South India was

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found to be 36.4%.[3] At 95% confidence limits and 10% absolute precision, the sample size was estimated to be 88.8. Accounting 10% for non response, the sample size was calculated as 97.6 and rounded off to 100. A total of 106 pregnant women participated in the study. The participants were selected using purposive sampling.

c) Ethical approval and informed consent

Approval was obtained from the Institutional Ethics Committee prior to the commencement of the study. Each participant was explained in detail about the study and informed consent was obtained prior to the data collection.

d) Data collection

On admission, sterile vaginal speculum examination was carried out. The character and consistency of the vaginal discharge was visually inspected. Vaginal pH was determined by swabbing the lateral and posterior fornices of the vagina, and the swab was directly placed on the litmus paper to determine the pH. Whiff's test was performed by adding 10% KOH to the specimen to detect the presence of 'fishy' odour, which is suggestive of BV. Gram stained smears were examined under oil immersion for morphotypes and presence of clue cells. A 10 point scoring system was applied for detection of the morphotypes. (table 1) Confirmation of BV was made based on Nugent's criteria.[5]

e) Data analysis

Data was entered and analysed using SPSS ver.20 software. The prevalence of BV was expressed in percentages. The association between BV and pregnancy outcomes were analysed by chi square test. A p value <0.05 was considered statistically significant.

IV. Results

The present study was carried out among 106 pregnant women who were admitted to our facility during the study period. Majority of the participants were registered (89.6%) and were primigravida (73.6%). (table 2) The prevalence of BV based on various diagnostic criteria is given in table 2. While pH estimation was positive in 35.8% of the participants, the confirmatory Nugent's criteria was positive in 16.04%. (table 3).

The pregnancy outcomes among the study participants is presented in figure 1. Low birth weight was present in 17.9% of the participants of which 73.7% had BV. Similarly, preterm labour was observed in 13.2% of the participants of which 42.8% had BV.

The present study observed a statistically significant association between BV and preterm labour ($p<0.05$). (table 4) Similarly, there was a statistically significant association between BV and low birth weight, with a mean birth weight of 2100 grams among participants with BV compared to 3210 grams among normal pregnant mothers ($p<0.05$). (Table 5).

V. Discussion

Prematurity remains one of the major causes of perinatal mortality and morbidity in India. The etiology and risk factors of preterm labour are multifactorial. Recently, lower genital tract infections have been attributed to preterm labour and one of the most predominant caused of lower genital tract infections is bacterial vaginosis. In the current study, the prevalence of BV, as estimated using Nugent's criteria was 16.04%, similar to other published literature, as observed by Purwar M et al (11.5%).[6] However, a study done by Mathew R et al reported a higher prevalence of 38.5%.[3] This difference could have occurred due to the differences in the population covered between the two studies. The justification for using Nugent's criteria for diagnosis is supported by the fact that this technique helps not only in storage of the slides for a longer period for reference, but also is suitable for quick screening and identification of intermediate flora.

The present study has proven a statistically significant association between BV and preterm labour and also with low birth weight ($p<0.05$). Several studies are supportive of this evidence. A study done by Hillier et al has observed a relative risk of 2.0 among women with BV in undergoing preterm delivery ($p<0.05$).[7] Similar findings were observed in studies done by Leitich H et al and Klebanoff MA et al.[8,9] In another study done by Hillier et al, there was a statistically significant relationship observed between BV and low birth weight, in addition to being a potent risk factor for preterm delivery. Presence of BV contributes to spontaneous preterm delivery by triggering localized inflammation of the endometrium, creating an environment incompatible for proper placenta formation. This in turn triggers increased production of circulating cytokines which results in preterm premature rupture of membranes (PPROM) and thereby cause preterm delivery. Presence of proinflammatory cytokines cause release of prostaglandins which trigger uterine contractions. Moreover, the lower genital tract bacteria invades the chorioamniotic space and infiltrates the placenta and amniotic fluid. Studies have established strong, two-fold increase in the risk of preterm labour in the presence of Gardnerella vaginalis.[4] Presence of chorioamnionitis further triggers neonatal sepsis, resulting in low birth weight and adverse neonatal outcomes including meconium aspiration, respiratory distress and increased risk of NICU admissions.[10]

Although metronidazole has been effective in the management of BV in non pregnant women, studies have recently demonstrated a resistance to metronidazole in the later gestational age. This phenomenon is attributed to the route of administration and also to the type of bacterial colonization present. It has been observed that vaginal administration of metronidazole has better outcomes in terms of

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preventing preterm labour. Since lactobacilli are resistant to metronidazole, isolation of lactobacilli in the vaginal smears pose a significant challenge in the clinical management.

VI. Conclusion

Abnormal vaginal bacterial flora is an important cause of adverse obstetric outcomes. Bacterial vaginosis is associated with high rates of spontaneous preterm labour, PPROM, low birth weight, chorioamnionitis, and postpartum endometritis. It is also associated with gynecological morbidities like pelvic inflammatory disease, cervical intra epithelial neoplasia and post hysterectomy vaginal cuff infection. A simple method like gram-stained examination of vaginal smear is found to be useful in diagnosing bacterial vaginosis. If the diagnosis of bacterial vaginosis is possible by early detection, prevention of preterm labour by treatment is possible and would play a great role in significant reductions in the preterm birth and its adverse sequelae.

Declaration

Conflict of interest – nil

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Tables & Figures

Table 1: Bacterial morphotype scoring based on gram staining

S. No.	Morphotype	Scoring				
		0	1+	2+	3+	4+
1	Long gram positive rod	4	3	2	1	0
2	Small gram negative variable rod	0	1	2	3	4
3	Curved gram negative variable rod	0	1	1	2	2

Table 2: Background characteristics of the study participants

S. No.	Characteristics	Frequency (n=106)	Percentage (%)
1	Registration of pregnancy		
	Booked	95	89.6
	Un-booked	11	10.4
2	Gravida		
	Primigravida	78	73.6
	Multigravida	28	26.4

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Table 3: Prevalence of bacterial vaginosis by various diagnostic methods

S. No.	Diagnostic methods	Frequency (n=106)	Percentage (%)
1	Homogenous vaginal discharge	14	13.2
2	Vaginal fluid pH >4.5	38	35.8
3	Whiff's test	25	23.6
4	Gram stain examination of clue cells	13	12.3
5	Nugent's criteria	17	16.04

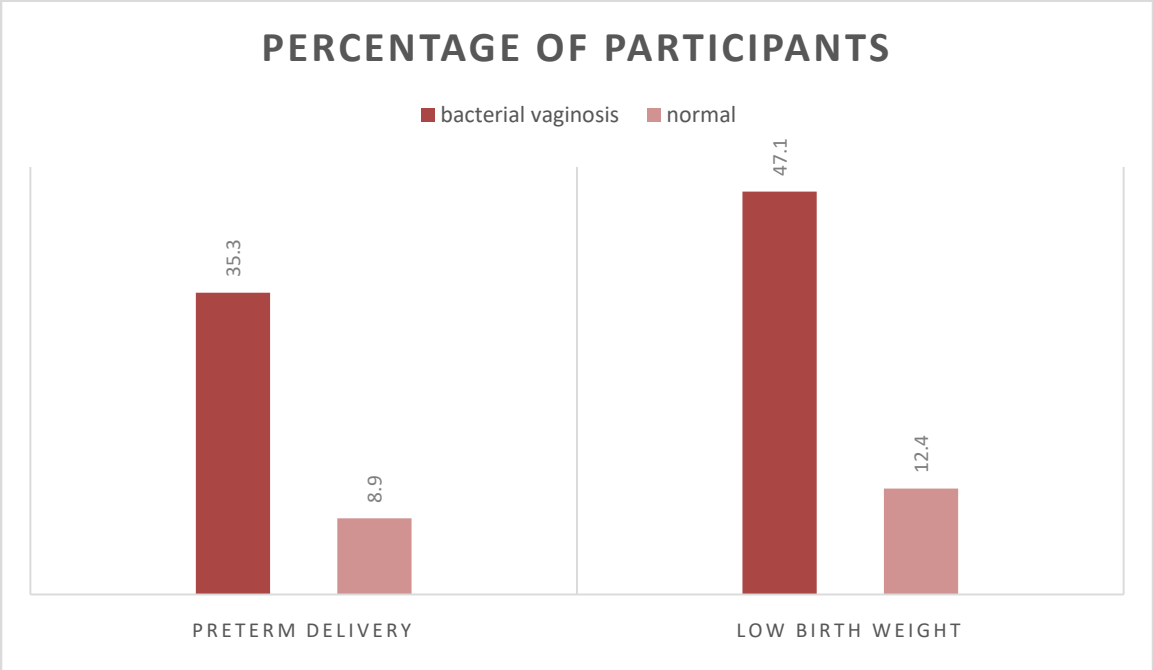

Figure 1: Pregnancy outcomes among the study participants

Table 4: Association between bacterial vaginosis and pregnancy outcomes - preterm delivery

S. No.	Disease condition	N	Preterm delivery n(%)	Term delivery n(%)	Chi sq	p value
1	Bacterial vaginosis	17	6(35.3)	11(64.7)	8.6	0.003*
2	Normal	89	8(8.9)	81(91.1)		
Total		106	14	92		

**statistically significant*

Table 5: Association between bacterial vaginosis and pregnancy outcomes- low birth weight

S. No.	Disease condition	N	Low birth weight n(%)	Normal birth weight n(%)	Chi sq	p value
1	Bacterial vaginosis	17	8(47.1)	9(52.9)	11.7	0.0006*
2	Normal	89	11(12.4)	78(87.6)		
Total		106	19	87		

**statistically significant*

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A Case of Isolated Hemorrhagic Pleural Effusion: A Rare Presentation of Ovarian Hyperstimulation Syndrome (OHSS) - A Case Report

By Sailaja Kambhampati & M C V Sreekar

Abstract- *Introduction:* Ovarian hyperstimulation syndrome (OHSS) is a rare, life-threatening serious complication of ovulation induction with human chorionic gonadotropin (hCG). (4)

3% of patients undergoing IVF (in vitro fertilisation) develop OHSS. But radiologically evident pleural effusions develop only in 1% among which hemorrhagic effusions are very rare (1).

Pleural effusions due to OHSS are usually associated with ascites. Isolated unilateral pleural effusions are uncommon. (2,3)

The syndrome occurs in the luteal phase or during early part of pregnancy. The syndrome was first described in 1941 and the first fatal case of OHSS with renal failure and death was described in 1951.

Keywords: *ovarian hyperstimulation syndrome (OHSS) pleural effusion hemorrhagic unilateral isolated.*

GJMR-E Classification: *NLMC Code: WP 660*

ACASEOFISOLATEDHEMORRHAGICPLEURALEFFUSIONARAREPRESENTATIONOFOVARIANHYPERSTIMULATIONSYNDROMEOHSSACASEREPORT

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Sailaja Kambhampati α & M C V Sreekar σ

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The syndrome occurs in the luteal phase or during early part of pregnancy. The syndrome was first described in 1941 and the first fatal case of OHSS with renal failure and death was described in 1951.

The number of patients who undergo infertility treatment at IVF centers has been increasing.(2)Therefore, it should be kept in mind that there may be unilateral pleural effusion without peritoneal fluid in OHSS which can be life threatening and needs to be evaluated as soon as possible. Physicians should consider this potentially life-threatening diagnosis in all patients who undergo ovarian hyperstimulation. (4)

Here, we present a case with ISOLATED UNILATERAL HEMORRHAGIC PLEURAL EFFUSION due to OHSS.

Keywords: ovarian hyperstimulation syndrome (OHSS) pleural effusion hemorrhagic unilateral isolated.

I. Case Report

A 30-year old nulliparous woman who has been married for 4 years with no significant medical history enrolled in an IVF center. On the second day of the menstrual cycle there were 9 antral follicles on each ovary and the levels of follicle stimulating hormone (FSH), luteinizing hormone and estradiol (E2) were 6.26 mIU/ml, 2.14 mIU/ml and 18 pg/ml respectively. The spermiogram parameters are normal {sperm count-200million/ml, percentage of motile cells-79%, percentage of abnormal cells-34%}. Ovarian stimulation was initiated with 200 IU of recombinant FSH (rFSH) for 5 days. This dose was increased to 250 IU on the fifth day because of low levels of E2 and low ovarian response. On the 10th day of induction there were two follicles that reached the size of 20 mm and 18 mm as seen on ultrasonography. Her peak E2 level was 1934 pg/ml. Next 10,000 IU urinary human chorionic gonadotropin (hCG) was injected and oocyte pickup (OPU) was performed at the 36th hour. A total of 10 oocytes were retrieved. One embryo transfer (ET) was performed on the third day of OPU. On the 12th day of ET the β-hCG level was 378 IU/ml.

On the seventh day after she was β-hCG positive she presented with complaints of dyspnea, cough and chest pain. She had tachypnea (respiratory rate-26/min) and tachycardia (pulse rate-123/min). She had a weight gain of 2 kg and she was afebrile. Her Oxygen saturation on room air was 90% as measured on pulse oximetry. There were no complaints pertaining to the abdomen (nausea, vomiting, abdominal distention).

Lab investigations revealed hematocrit of 42% and normal electrolytes, liver and renal functions. Chest x ray was not performed in view of her pregnancy and ultrasound of the abdomen revealed a moderate right pleural effusion. Her echocardiography and electro-cardiography (ECG) did not revealed any abnormality. The patient was subjected to an abdominal ultrasound also and the ovaries were enlarged bilaterally (right: 86×63mm; left: 87×59 mm) with no evidence of intraperitoneal fluid.

Thoracentesis was performed on the affected side and nearly 1500 cc hemorrhagic coloured fluid was recovered. The fluid analysis showed protein- 4.65g/l, LDH of 101(IU/l) thus fitting into an exudative fluid as per lights criteria.

Fluid was lymphocyte and rbc predominant (hemorrhagic) Malignancy, pulmonary embolism were considered in the differential diagnosis and pleural fluid was screened for malignant cells and bilateral lower limb venous Doppler was done which did not revealed any deep vein thrombosis.

She was followed closely as an outpatient and she recovered fully without any sequele.

II. Discussion

Although it varies depending on the level, the pleural cavity has a width of approximately 18–20 μm. The pleural membranes do not touch each other, which makes it a real gap, not a potential space. Classically, pleural effusion is the accumulation of fluid in the pleural cavity, which may be caused by any reason (5). OHSS is a rare, usually self-limiting, life-threatening iatrogenic

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complication (4). In 1975, unilateral pleural effusion in OHSS was first described (6). The risk factors for OHSS are: young age, low body mass index, polycystic ovary syndrome, increased E2 levels, a previous history of the presence of OHSS, hypothyroidism and molar pregnancy (7). OHSS is classified as mild, moderate, severe or critical. Mild manifestations of OHSS are relatively common in induced cycles and include abdominal distension, mild nausea, vomiting and diarrhea (2,3). With progression of the illness pleural and pericardial effusion can be observed, which are regarded as severe OHSS (8). Our patient was classified as severe OHSS (based on the presence of severe dyspnea and moderate pleural effusion) even though she did not have intractable nausea or vomiting, oliguria, venous thrombosis. Severe OHSS has been reported in less than 2% of patients who require hospitalization. Early OHSS is correlated to ovarian response to stimulation and is an acute effect of the administration of exogenous hCG that usually occurs within 9 days after oocyte retrieval. In contrast, late OHSS occurs after the initial 10 day period, is only poorly correlated to ovarian response and is more correlated to the endogenous hCG produced by an implanting embryo (9). The main aim of the induction of ovulation is to achieve pregnancy but if pregnancy occurs OHSS tends to be more severe and may last longer. Although its pathophysiology is not known exactly, an increase in capillary permeability, fluid accumulation in a third space caused by this increase and inadequate organ perfusion are suspected. Vascular endothelial growth factor (VEGF), components of the renin–angiotensin system, prostaglandin, and cytokines such as interleukin (IL)-6 and IL-8 play a role in its etiopathogenesis. (10). Capillary permeability is reduced by 70% by the administration of VEGF antibodies, which is considered the most essential factor. Holes in the diaphragm and negative intrapleural pressure may draw fluid from the abdomen to the thoracic cavity (2). However, it is hard to explain unilateral pleural fluid. Although its pathogenesis is controversial, it is attributed to the fact that lymphatic drainage on the right side is less compared with on the left side, and holes in the diaphragm occur more often on the right side (2,10). In our patient pleural fluid was on the right side and there was no fluid in the abdomen (9). She recovered by pleural drainage and supportive therapy. In the literature pleural effusion may be exudative (as in our patient) or transudative (9). Because of our patient's pregnancy, a chest Xray could not be performed but ultrasound helped us to diagnose pleural effusion. In the literature there are reports about the use of ultrasound in pleural effusion (3,4,9). Also, ultrasound can detect as little as 5 mL pleural fluid (5). In our patient although there was a large amount of pleural effusion, no other significant markers of severe OHSS were present. If only the abdominal cavity is examined, pleural effusion could easily be overlooked. A good complete examination of an OHSS patient, early diagnosis, adequate pleural drainage, and then good supportive therapy make the prognosis of OHSS favourable.

III. Conclusion

As a result, the number of cases resorting to the treatment of infertility and the number of centers where it is employed have been increasing. Although OHSS is considered as if it is a syndrome that belongs to gynecology and obstetrics clinics or IVF units, the chances of clinicians who work in the emergency service and thoracic diseases and thoracic surgery centers encountering these patients have increased. Therefore, it should be kept in mind that there may be unilateral pleural effusion without peritoneal fluid in OHSS.

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Prevalence, Risk Factors and Awareness about HCV Infection in Pregnant Women in a Tertiary Care Center in North India

By Dr. Renu Gupta, Dr. Rashmi Kumari, Dr. Shaily Agarwal, Dr. Kiran Pandey, Dr. Neena Gupta & Dr. Pavika Lal

Introduction- Among the viral infections affecting the liver in pregnancy, Hepatitis C though uncommon now is recognized to be a serious global public health problem affecting 170 million people worldwide I .e. 3% of the population [1]. The prevalence of anti-HCV antibody in pregnant women in developed countries ranges from 0.14 to 4.4 %, whereas the seroprevalence in Indian pregnant female population is 1.03 % [2, 3, 4].

Following the decreasing transmission of HCV by blood -transfusion, intravenous drug use has now become the primary route of new HCV infections in adults while mother to child transmission (MTCT) is the major route of new infections in young children in the developed as well as in developing countries.[5] Approximately 7–8 % of hepatitis C virus-positive women transmit this virus to their offspring [6] mainly because they are ignorant about this infection and unaware of their status. The natural course of hepatitis C is a progression from acute hepatitis to chronic hepatitis, which occurs in 55%- 85 % of patients.

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Prevalence, Risk Factors and Awareness about HCV Infection in Pregnant Women in a Tertiary Care Center in North India

Dr. Renu Gupta [α], Dr. Rashmi Kumari [σ], Dr. Shaily Agarwal [ρ], Dr. Kiran Pandey [ω], Dr. Neena Gupta [¥] & Dr. Pavika Lal [§]

I. Introduction

Among the viral infections affecting the liver in pregnancy, Hepatitis C though uncommon now is recognized to be a serious global public health problem affecting 170 million people worldwide I .e. 3% of the population [1]. The prevalence of anti-HCV antibody in pregnant women in developed countries ranges from 0.14 to 4.4 %, whereas the seroprevalence in Indian pregnant female population is 1.03 % [2, 3, 4].

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Hepatitis C infection leads to chronic liver disease, cirrhosis as well as known to cause hepatocellular carcinoma. Still World Health Organization (WHO) do not recommend the universal screening of Hepatitis B and C in pregnant women, although testing of HIV is mandatory after proper voluntary counseling. The study was undertaken with the aim to assess the exclusive seroprevalence of Hepatitis C infection in pregnant females and to know the risk factors, their attitude, and awareness against this dreadful disease.

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II. Material and Methods

This was a prospective observational study done at our tertiary care center in the obstetrics and gynecology department of UISEMH,GSVM Medical College in Kanpur(India) from November 2017 to August 2019.After taking a proper written informed consent, all antenatal women attending the OPD and in emergency who were exclusively HCV positive were included in the study group. Age, Parity, Gestational age-matched women delivering during the same time frame who were tested negative for HCV were taken as controls. The initially reactive samples were re-tested and considered ELISA positive if both results were reactive. Once hepatitis C was diagnosed, a qualitative HCV RNA test was done to determine the baseline viral load by RNA PCR. A structured questionnaire was prepared comprising of questions and a face to face interview was done to know the awareness of viral infections during the antenatal period.

Those previously diagnosed to have some chronic liver disease, Intrahepatic cholestasis of pregnancy, or co-infection with HIV and Hepatitis B were excluded from the study. Laboratory tests to evaluate the extent of liver disease were done, including the following: Bilirubin, ALT, AST, albumin, platelet count, and prothrombin time. A total of 5853 antenatal patients had reported during the study period, out of which 126 were found to be HCV positive. The patients were further advised for HCV RNA, but only 98 had opted for HCV RNA.

Statistical Analysis– Data was analyzed using SPSS 22.0.Categorical variables were analyzed using the Odds ratio (OD), and the Chi-square test & p-value <0.05 were considered significant. The study has been approved by the Ethics Committee of GSVM Medical College, Kanpur.

III. Results

One hundred twenty-six (2.15 %) of the 5853 pregnant women tested positive for anti HCV antibodies. Of these, 72 (73.4%) were positive for HCV RNA by RT - PCR. Most of the HCV reactive obstetric patients were in the reproductive age group and the mean age was 26.3

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years. Slightly higher rate of infection was found among women living in rural areas, which was 58.7% while that in the urban area was 41.2%.Both study and control groups had similar educational qualifications. (Table 1)

Most patients in the study group belonged to lower socioeconomic status. In the HCV infected group, 44.4 % patients belonged to lower socioeconomic status, while only 26.9% were of upper socioeconomic status. 46.8% were diagnosed in the intrapartum period, while only 38% were diagnosed during their antenatal visits among the risk factors for HCV infection previous history of blood transfusions, dilatation and curettage, previous surgery were studied as independent risk factors (Table 2). The majority, 52.7% of the RNA positive patients and 46.1 % in RNA negative had a history of any surgery (Table 3). Of the 126 HCV positive patients, 22% did not have any identifiable risk factors. Of the 5853 patients questioned, maximum awareness was about HIV and least about HCV (Table 4).

Table 1: Demographic Distribution In Hcv Positive Obstetric Patients

	HCV POSITIVE(N=126)	
	NUMBER	PERCENTAGE
TOTAL	126	%
AGE		
15-24 year	41	32.5
25-35	80	63.5
>35	05	3.9
HABITAT		
Rural	74	58.7
Urban	52	41.2
PARITY		
Nullipara	27	21.4
Multipara	99	78.5
EDUCATION STATUS		
Illiterate	51	40.4
Primary	58	46.0
Secondary	17	13.49

Table 2: Association of Risk Factors in HCV Positive Obstetric Patients

Risk Factors	HCV Positive (n=126)		HCV Negative (n =5727)	p-value
	HCV RNA Positive (n =72)	HCV RNA negative (n=26)		
H/O Blood transfusion	16	9	456	<0.001*
	32%	40.9%	8.0%	
H/O Abortions	04	03	1125	<0.001*
	8%	13.6%	19.6%	
H/O multiple sex partners	03	02	25	0.00001*
	4.1%	7.6%	0.43%	
H/O Episiotomy	24	12	3818	0.00001*
	33.3	46.1	66.6	

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Table 3: Association of Surgery as Risk Factor in HCV Positive Obstetric Patients

Risk factors	HCV Positive		HCV Negative (n= 5727)	p value
	HCV RNA positive (n=72)	HCV RNA negative (n=26)		
H/O D&C	06	04	987	0.00603*
	12%	18.2%	17.2%	
H/O Previous surgery	15	7	1007	0.041*
	30%	31.8%	17.6%	
H/O Dental procedure	01	00	12	0.168
	1.38%	00	0.2%	
H/O Amniocentesis	01	00	24	0.523
	0.79%	1.38%	0.41%	

Table 4: Awareness of Various Viral Infections in Pregnancy

		HIV		HBsAg		HCV	
		No.	%	No.	%	No.	%
Do you know the various routes of transmission?	YES	3506	59.9	1880	32.1	1006	17.1
	NO	2347	40	3973	67.8	4847	82.8
Do you know about mother to child transmission?	YES	1290	22.03	1205	20.5	985	16.8
	NO	4563	77.9	4648	79.4	4868	83.17
Do you know Breast feeding transmits this infection?	YES	2350	40.1	1810	30.9	1200	20.5
	NO	3503	59.8	4043	69.0	4653	79.4

IV. Discussion

Our study represents a single hospital-based report to define the seroprevalence, risk factors, and knowledge of hepatitis C infection in our patient population of pregnant women which usually caters to Kanpur and it's adjoining areas (Kanpur-Dehat).

The prevalence of Hepatitis C positive pregnant women was found to be 2.15 % in our study, which is almost double the reported prevalence of 1.03% in a study from North India by *Kumar A et al*. [7] and similar to the findings of other epidemiologic studies [3,11]. Prevalence in western countries ranges from 0.14 to 4.4% due to more awareness towards one's health, education and better health care facilities [2, 3]. The highest prevalence of infection occurs among the individuals of the reproductive age group 25-35 years because this is the peak age group and also at the same time explains the increased chances of exposure of these group of women to risk factors. [8,9,10].

The study also found a higher rate of infection among women living in rural areas, with higher parity and those belonging to rural areas. Higher infection rates among rural residents may be partially explained by the higher prevalence of anemia among rural women. *Leiken et al.* have reported a higher mean parity of HCV positive patients in their study [10]. They might be at increased risk because of their past pregnancies, hospital admissions, past surgeries, obstetrical procedures, and blood transfusions.

Earlier studies by *Bohman VR et al.* have found an association between the prevalence of HCV and the known risk factors of this infection [11]. In our study, history of D & C, surgery, and blood transfusion were found to be major risk factors for transmission of HCV infection. Patients are exposed to unsterilized instrumentation where D&C is done by paramedical staff without maintaining aseptic conditions .Also in a study by *Hutin Y et al*., it has been reported that in resource-poor countries, the risk of iatrogenic HCV infection is high [12]. Intravenous drug abuse is a significant risk factor in western countries [13]. In a study from Northern Italy, the principal risk factors were a history of intravenous drug abuse (32%) and exposure to blood products (24%).

It was found that 73.4% of the anti-HCV antibody-positive pregnant women had detectable HCV RNA in their blood, a figure that is similar to that found in most of the studies.[15-17]

We found no significant association with maternal and neonatal morbidity, but there are few studies which reveal increased risk of obstetric complications, but they had a few sample size, which

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was inconclusive. In our study there was no significant variation in the level of liver enzymes Serum transaminases and total bilirubin. This finding was similar to a study by *Paternoster et al.* [14] supporting the immune-mediated hypothesis.

In the present study, it was found that a substantial proportion of women with HCV had no evidence of exposure to any known risk factors in their history, about 22% of patients did not have any identifiable risk factor. This is comparable with the observation by *Ward C et al.* [15], that 40-73% of the women had no obvious risk factors for HCV infection at the time of booking. It has been found that selective antenatal screening policy based on risk factors, failed to identify over half of infected patients. [18]

Routine antenatal HCV screening is not mandatory in India, but identification of HCV in pregnant women is important because of their risk of long term complications of infection, potential effects on pregnancy, and risk of transmission to their infants. Therefore universal screening for HCV can be recommended.

V. Conclusion

In our study, we found that there is high prevalence of Hepatitis C infection in pregnant women posing a public health problem. Organizational bodies such as American College of Obstetricians and Gynecologists and Society for Maternal and Fetal medicine recommend selective antenatal screening solely based on high-risk factors which fail to identify over half of the infected patients, therefore universal screening in a pregnant female is justifiable and should be recommended to identify patients without any risk factors. Although it does not adversely affect the maternal or the neonatal outcome, but hepatitis C has long term ill effects on the health of both the mother and the child.

The need of the hour is to increase the awareness of hepatitis C infection by implementing educational programs through mass media as presently done for HIV infection as well as by emphasis on preventive measures such as sterilization of instruments, screening blood and blood products and making services more accessible with increasing utilization of antenatal services in rural areas.

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Acknowledgments

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The following is the official style and template developed for publication of a research paper. Authors are not required to follow this style during the submission of the paper. It is just for reference purposes.

Manuscript Style Instruction (Optional)

- Microsoft Word Document Setting Instructions.
- Font type of all text should be Swis721 Lt BT.
- Page size: 8.27" x 11'", left margin: 0.65, right margin: 0.65, bottom margin: 0.75.
- Paper title should be in one column of font size 24.
- Author name in font size of 11 in one column.
- Abstract: font size 9 with the word "Abstract" in bold italics.
- Main text: font size 10 with two justified columns.
- Two columns with equal column width of 3.38 and spacing of 0.2.
- First character must be three lines drop-capped.
- The paragraph before spacing of 1 pt and after of 0 pt.
- Line spacing of 1 pt.
- Large images must be in one column.
- The names of first main headings (Heading 1) must be in Roman font, capital letters, and font size of 10.
- The names of second main headings (Heading 2) must not include numbers and must be in italics with a font size of 10.

Structure and Format of Manuscript

The recommended size of an original research paper is under 15,000 words and review papers under 7,000 words. Research articles should be less than 10,000 words. Research papers are usually longer than review papers. Review papers are reports of significant research (typically less than 7,000 words, including tables, figures, and references)

A research paper must include:

a) A title which should be relevant to the theme of the paper.
b) A summary, known as an abstract (less than 150 words), containing the major results and conclusions.
c) Up to 10 keywords that precisely identify the paper's subject, purpose, and focus.
d) An introduction, giving fundamental background objectives.
e) Resources and techniques with sufficient complete experimental details (wherever possible by reference) to permit repetition, sources of information must be given, and numerical methods must be specified by reference.
f) Results which should be presented concisely by well-designed tables and figures.
g) Suitable statistical data should also be given.
h) All data must have been gathered with attention to numerical detail in the planning stage.

Design has been recognized to be essential to experiments for a considerable time, and the editor has decided that any paper that appears not to have adequate numerical treatments of the data will be returned unrefereed.

i) Discussion should cover implications and consequences and not just recapitulate the results; conclusions should also be summarized.
j) There should be brief acknowledgments.
k) There ought to be references in the conventional format. Global Journals recommends APA format.

Authors should carefully consider the preparation of papers to ensure that they communicate effectively. Papers are much more likely to be accepted if they are carefully designed and laid out, contain few or no errors, are summarizing, and follow instructions. They will also be published with much fewer delays than those that require much technical and editorial correction.

The Editorial Board reserves the right to make literary corrections and suggestions to improve brevity.

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Format Structure

It is necessary that authors take care in submitting a manuscript that is written in simple language and adheres to published guidelines.

All manuscripts submitted to Global Journals should include:

Title

The title page must carry an informative title that reflects the content, a running title (less than 45 characters together with spaces), names of the authors and co-authors, and the place(s) where the work was carried out.

Author details

The full postal address of any related author(s) must be specified.

Abstract

The abstract is the foundation of the research paper. It should be clear and concise and must contain the objective of the paper and inferences drawn. It is advised to not include big mathematical equations or complicated jargon.

Many researchers searching for information online will use search engines such as Google, Yahoo or others. By optimizing your paper for search engines, you will amplify the chance of someone finding it. In turn, this will make it more likely to be viewed and cited in further works. Global Journals has compiled these guidelines to facilitate you to maximize the web-friendliness of the most public part of your paper.

Keywords

A major lynchpin of research work for the writing of research papers is the keyword search, which one will employ to find both library and internet resources. Up to eleven keywords or very brief phrases have to be given to help data retrieval, mining, and indexing.

One must be persistent and creative in using keywords. An effective keyword search requires a strategy: planning of a list of possible keywords and phrases to try.

Choice of the main keywords is the first tool of writing a research paper. Research paper writing is an art. Keyword search should be as strategic as possible.

One should start brainstorming lists of potential keywords before even beginning searching. Think about the most important concepts related to research work. Ask, “What words would a source have to include to be truly valuable in a research paper?” Then consider synonyms for the important words.

It may take the discovery of only one important paper to steer in the right keyword direction because, in most databases, the keywords under which a research paper is abstracted are listed with the paper.

Numerical Methods

Numerical methods used should be transparent and, where appropriate, supported by references.

Abbreviations

Authors must list all the abbreviations used in the paper at the end of the paper or in a separate table before using them.

Formulas and equations

Authors are advised to submit any mathematical equation using either MathJax, KaTeX, or LaTeX, or in a very high-quality image.

Tables, Figures, and Figure Legends

Tables: Tables should be cautiously designed, uncrowned, and include only essential data. Each must have an Arabic number, e.g., Table 4, a self-explanatory caption, and be on a separate sheet. Authors must submit tables in an editable format and not as images. References to these tables (if any) must be mentioned accurately.

Figures

Figures are supposed to be submitted as separate files. Always include a citation in the text for each figure using Arabic numbers, e.g., Fig. 4. Artwork must be submitted online in vector electronic form or by emailing it.

Preparation of Eletronic Figures for Publication

Although low-quality images are sufficient for review purposes, print publication requires high-quality images to prevent the final product being blurred or fuzzy. Submit (possibly by e-mail) EPS (line art) or TIFF (halftone/ photographs) files only. MS PowerPoint and Word Graphics are unsuitable for printed pictures. Avoid using pixel-oriented software. Scans (TIFF only) should have a resolution of at least 350 dpi (halftone) or 700 to 1100 dpi (line drawings). Please give the data for figures in black and white or submit a Color Work Agreement form. EPS files must be saved with fonts embedded (and with a TIFF preview, if possible).

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Tips for writing a good quality Medical Research Paper

1. Choosing the topic: In most cases, the topic is selected by the interests of the author, but it can also be suggested by the guides. You can have several topics, and then judge which you are most comfortable with. This may be done by asking several questions of yourself, like "Will I be able to carry out a search in this area? Will I find all necessary resources to accomplish the search? Will I be able to find all information in this field area?" If the answer to this type of question is "yes," then you ought to choose that topic. In most cases, you may have to conduct surveys and visit several places. Also, you might have to do a lot of work to find all the rises and falls of the various data on that subject. Sometimes, detailed information plays a vital role, instead of short information. Evaluators are human: The first thing to remember is that evaluators are also human beings. They are not only meant for rejecting a paper. They are here to evaluate your paper. So present your best aspect.

2. Think like evaluators: If you are in confusion or getting demotivated because your paper may not be accepted by the evaluators, then think, and try to evaluate your paper like an evaluator. Try to understand what an evaluator wants in your research paper, and you will automatically have your answer. Make blueprints of paper: The outline is the plan or framework that will help you to arrange your thoughts. It will make your paper logical. But remember that all points of your outline must be related to the topic you have chosen.

3. Ask your guides: If you are having any difficulty with your research, then do not hesitate to share your difficulty with your guide (if you have one). They will surely help you out and resolve your doubts. If you can't clarify what exactly you require for your work, then ask your supervisor to help you with an alternative. He or she might also provide you with a list of essential readings.

4. Use of computer is recommended: As you are doing research in the field of medical research then this point is quite obvious. Use right software: Always use good quality software packages. If you are not capable of judging good software, then you can lose the quality of your paper unknowingly. There are various programs available to help you which you can get through the internet.

5. Use the internet for help: An excellent start for your paper is using Google. It is a wondrous search engine, where you can have your doubts resolved. You may also read some answers for the frequent question of how to write your research paper or find a model research paper. You can download books from the internet. If you have all the required books, place importance on reading, selecting, and analyzing the specified information. Then sketch out your research paper. Use big pictures: You may use encyclopedias like Wikipedia to get pictures with the best resolution. At Global Journals, you should strictly follow here.

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6. Bookmarks are useful: When you read any book or magazine, you generally use bookmarks, right? It is a good habit which helps to not lose your continuity. You should always use bookmarks while searching on the internet also, which will make your search easier.

7. Revise what you wrote: When you write anything, always read it, summarize it, and then finalize it.

8. Make every effort: Make every effort to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in the introduction—what is the need for a particular research paper. Polish your work with good writing skills and always give an evaluator what he wants. Make backups: When you are going to do any important thing like making a research paper, you should always have backup copies of it either on your computer or on paper. This protects you from losing any portion of your important data.

9. Produce good diagrams of your own: Always try to include good charts or diagrams in your paper to improve quality. Using several unnecessary diagrams will degrade the quality of your paper by creating a hodgepodge. So always try to include diagrams which were made by you to improve the readability of your paper. Use of direct quotes: When you do research relevant to literature, history, or current affairs, then use of quotes becomes essential, but if the study is relevant to science, use of quotes is not preferable.

10. Use proper verb tense: Use proper verb tenses in your paper. Use past tense to present those events that have happened. Use present tense to indicate events that are going on. Use future tense to indicate events that will happen in the future. Use of wrong tenses will confuse the evaluator. Avoid sentences that are incomplete.

11. Pick a good study spot: Always try to pick a spot for your research which is quiet. Not every spot is good for studying.

12. Know what you know: Always try to know what you know by making objectives, otherwise you will be confused and unable to achieve your target.

13. Use good grammar: Always use good grammar and words that will have a positive impact on the evaluator; use of good vocabulary does not mean using tough words which the evaluator has to find in a dictionary. Do not fragment sentences. Eliminate one-word sentences. Do not ever use a big word when a smaller one would suffice.

Verbs have to be in agreement with their subjects. In a research paper, do not start sentences with conjunctions or finish them with prepositions. When writing formally, it is advisable to never split an infinitive because someone will (wrongly) complain. Avoid clichés like a disease. Always shun irritating alliteration. Use language which is simple and straightforward. Put together a neat summary.

14. Arrangement of information: Each section of the main body should start with an opening sentence, and there should be a changeover at the end of the section. Give only valid and powerful arguments for your topic. You may also maintain your arguments with records.

15. Never start at the last minute: Always allow enough time for research work. Leaving everything to the last minute will degrade your paper and spoil your work.

16. Multitasking in research is not good: Doing several things at the same time is a bad habit in the case of research activity. Research is an area where everything has a particular time slot. Divide your research work into parts, and do a particular part in a particular time slot.

17. Never copy others' work: Never copy others' work and give it your name because if the evaluator has seen it anywhere, you will be in trouble. Take proper rest and food: No matter how many hours you spend on your research activity, if you are not taking care of your health, then all your efforts will have been in vain. For quality research, take proper rest and food.

18. Go to seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.

19. Refresh your mind after intervals: Try to give your mind a rest by listening to soft music or sleeping in intervals. This will also improve your memory. Acquire colleagues: Always try to acquire colleagues. No matter how sharp you are, if you acquire colleagues, they can give you ideas which will be helpful to your research.

20. Think technically: Always think technically. If anything happens, search for its reasons, benefits, and demerits. Think and then print: When you go to print your paper, check that tables are not split, headings are not detached from their descriptions, and page sequence is maintained.

21. Adding unnecessary information: Do not add unnecessary information like "I have used MS Excel to draw graphs." Irrelevant and inappropriate material is superfluous. Foreign terminology and phrases are not apropos. One should never take a broad view. Analogy is like feathers on a snake. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Never oversimplify: When adding material to your research paper, never go for oversimplification; this will definitely irritate the evaluator. Be specific. Never use rhythmic redundancies. Contractions shouldn't be used in a research paper. Comparisons are as terrible as clichés. Give up ampersands, abbreviations, and so on. Remove commas that are not necessary. Parenthetical words should be between brackets or commas. Understatement is always the best way to put forward earth-shaking thoughts. Give a detailed literary review.

22. Report concluded results: Use concluded results. From raw data, filter the results, and then conclude your studies based on measurements and observations taken. An appropriate number of decimal places should be used. Parenthetical remarks are prohibited here. Proofread carefully at the final stage. At the end, give an outline to your arguments. Spot perspectives of further study of the subject. Justify your conclusion at the bottom sufficiently, which will probably include examples.

23. Upon conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium though which your research is going to be in print for the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects of your research.

Informal Guidelines of Research Paper Writing

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form which is presented in the guidelines using the template.
- Please note the criteria peer reviewers will use for grading the final paper.

Final points:

One purpose of organizing a research paper is to let people interpret your efforts selectively. The journal requires the following sections, submitted in the order listed, with each section starting on a new page:

The introduction: This will be compiled from reference matter and reflect the design processes or outline of basis that directed you to make a study. As you carry out the process of study, the method and process section will be constructed like that. The results segment will show related statistics in nearly sequential order and direct reviewers to similar intellectual paths throughout the data that you gathered to carry out your study.

The discussion section:

This will provide understanding of the data and projections as to the implications of the results. The use of good quality references throughout the paper will give the effort trustworthiness by representing an alertness to prior workings.

Writing a research paper is not an easy job, no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record-keeping are the only means to make straightforward progression.

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Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear: Adhere to recommended page limits.

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Mistakes to avoid:

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- Submitting a manuscript with pages out of sequence.
- In every section of your document, use standard writing style, including articles ("a" and "the").
- Keep paying attention to the topic of the paper.
- Use paragraphs to split each significant point (excluding the abstract).
- Align the primary line of each section.
- Present your points in sound order.
- Use present tense to report well-accepted matters.
- Use past tense to describe specific results.
- Do not use familiar wording; don't address the reviewer directly. Don't use slang or superlatives.
- Avoid use of extra pictures—include only those figures essential to presenting results.

Title page:

Choose a revealing title. It should be short and include the name(s) and address(es) of all authors. It should not have acronyms or abbreviations or exceed two printed lines.

Abstract: This summary should be two hundred words or less. It should clearly and briefly explain the key findings reported in the manuscript and must have precise statistics. It should not have acronyms or abbreviations. It should be logical in itself. Do not cite references at this point.

An abstract is a brief, distinct paragraph summary of finished work or work in development. In a minute or less, a reviewer can be taught the foundation behind the study, common approaches to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Use comprehensive sentences, and do not sacrifice readability for brevity; you can maintain it succinctly by phrasing sentences so that they provide more than a lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study with the subsequent elements in any summary. Try to limit the initial two items to no more than one line each.

Reason for writing the article—theory, overall issue, purpose.

- Fundamental goal.
- To-the-point depiction of the research.
- Consequences, including definite statistics—if the consequences are quantitative in nature, account for this; results of any numerical analysis should be reported. Significant conclusions or questions that emerge from the research.

Approach:

- Single section and succinct.
- An outline of the job done is always written in past tense.
- Concentrate on shortening results—limit background information to a verdict or two.
- Exact spelling, clarity of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else.

Introduction:

The introduction should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable of comprehending and calculating the purpose of your study without having to refer to other works. The basis for the study should be offered. Give the most important references, but avoid making a comprehensive appraisal of the topic. Describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will give no attention to your results. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here.

The following approach can create a valuable beginning:

- Explain the value (significance) of the study.
- Defend the model—why did you employ this particular system or method? What is its compensation? Remark upon its appropriateness from an abstract point of view as well as pointing out sensible reasons for using it.
- Present a justification. State your particular theory(-ies) or aim(s), and describe the logic that led you to choose them.
- Briefly explain the study's tentative purpose and how it meets the declared objectives.

Approach:

Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done. Sort out your thoughts; manufacture one key point for every section. If you make the four points listed above, you will need at least four paragraphs. Present surrounding information only when it is necessary to support a situation. The reviewer does not desire to read everything you know about a topic. Shape the theory specifically—do not take a broad view.

As always, give awareness to spelling, simplicity, and correctness of sentences and phrases.

Procedures (methods and materials):

This part is supposed to be the easiest to carve if you have good skills. A soundly written procedures segment allows a capable scientist to replicate your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order, but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt to give the least amount of information that would permit another capable scientist to replicate your outcome, but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section.

When a technique is used that has been well-described in another section, mention the specific item describing the way, but draw the basic principle while stating the situation. The purpose is to show all particular resources and broad procedures so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step-by-step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

Materials may be reported in part of a section or else they may be recognized along with your measures.

Methods:

- Report the method and not the particulars of each process that engaged the same methodology.
- Describe the method entirely.
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures.
- Simplify—detail how procedures were completed, not how they were performed on a particular day.
- If well-known procedures were used, account for the procedure by name, possibly with a reference, and that's all.

Approach:

It is embarrassing to use vigorous voice when documenting methods without using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result, when writing up the methods, most authors use third person passive voice.

Use standard style in this and every other part of the paper—avoid familiar lists, and use full sentences.

What to keep away from:

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings—save it for the argument.
- Leave out information that is immaterial to a third party.

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Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part as entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Use statistics and tables, if suitable, to present consequences most efficiently.

You must clearly differentiate material which would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matters should not be submitted at all except if requested by the instructor.

Content:

- Sum up your conclusions in text and demonstrate them, if suitable, with figures and tables.
- In the manuscript, explain each of your consequences, and point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation of an exacting study.
- Explain results of control experiments and give remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or manuscript.

What to stay away from:

- Do not discuss or infer your outcome, report surrounding information, or try to explain anything.
- Do not include raw data or intermediate calculations in a research manuscript.
- Do not present similar data more than once.
- A manuscript should complement any figures or tables, not duplicate information.
- Never confuse figures with tables—there is a difference.

Approach:

As always, use past tense when you submit your results, and put the whole thing in a reasonable order.

Put figures and tables, appropriately numbered, in order at the end of the report.

If you desire, you may place your figures and tables properly within the text of your results section.

Figures and tables:

If you put figures and tables at the end of some details, make certain that they are visibly distinguished from any attached appendix materials, such as raw facts. Whatever the position, each table must be titled, numbered one after the other, and include a heading. All figures and tables must be divided from the text.

Discussion:

The discussion is expected to be the trickiest segment to write. A lot of papers submitted to the journal are discarded based on problems with the discussion. There is no rule for how long an argument should be.

Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implications of the study. The purpose here is to offer an understanding of your results and support all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of results should be fully described.

Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact, you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved the prospect, and let it drop at that. Make a decision as to whether each premise is supported or discarded or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."

Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work.

- You may propose future guidelines, such as how an experiment might be personalized to accomplish a new idea.
- Give details of all of your remarks as much as possible, focusing on mechanisms.
- Make a decision as to whether the tentative design sufficiently addressed the theory and whether or not it was correctly restricted. Try to present substitute explanations if they are sensible alternatives.
- One piece of research will not counter an overall question, so maintain the large picture in mind. Where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

When you refer to information, differentiate data generated by your own studies from other available information. Present work done by specific persons (including you) in past tense.

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Result	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
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References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

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