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Original Research Article

Enhancing women's knowledge and awareness of preconception care: promoting optimal reproductive health outcomes

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ABSTRACT

Background: Preconception care (PCC) is crucial to mother and child health. Many women don't realise how PCC might affect pregnancy and labour. Hence, we aimed to assess women's current knowledge and awareness levels regarding PCC, enhance knowledge, and empower women to prioritize proactive healthcare before conception.

Methods: This cross-sectional study consisted of 200 reproductive-age women. Infertility therapy (n=50), poor obstetrics history (n=50), and term delivery (n=100) were the three groups. Family, gynaecological, and demographic data were obtained. Preconception care and medical issues that affect pregnancy outcomes were taught to all study participants to identify risk factors.

Results: Most participants were aged between 18 and 25 (48%). Primary infertility was present in 52% of women. The main causes of infertility were pelvic inflammatory disease (40%) and genital tuberculosis (20%), treated with antibiotics and anti-tubercular medicines, respectively. Only 1 woman had both preconception and antenatal checkups, while 30 had neither. Maternal morbidity occurred in 52% of normal deliveries, with anaemia being the most prevalent. Caesarean sections were mostly due to prior 1 lower segment caesarean section (LSCS) (32%). Conception and healthy births were achieved in 10% and 6% of BOH patients and 18% and 10% of infertile patients, respectively.

Conclusions: There is a need to provide women with accurate and detailed information on PCC and to establish functional clinics with evidence-based guidelines to enhance uptake and pregnancy outcomes.

Keywords: Preconception Care, Pregnancy, Diabetes mellitus, Fetomaternal outcomes, Infertility

INTRODUCTION

Preconception care (PCC) has been introduced to reduce maternal and fetal mortality and morbidity. Initially, it was thought that if we give good emergency antenatal care and intranatal care, we would be able to reduce maternal and fetal mortality and morbidity. It was realized that it is not only good antenatal and intranatal care but also good PCC will prevent many adverse outcomes for the mother and fetus. Preconceptional medicine is now developing into a new branch of Obstetrics. It is recognized as preventive obstetrics of the primary kind. It adds to the fetal origin of adult diseases.¹ PCC aims to identify and modify biomedical, behavioural, and psychosocial risks to

women's health and pregnancy outcomes through prevention and management.² PCC has not yet become a routine healthcare practice globally despite its potential benefits. Studies have highlighted the lack of well-established registered programs for PCC implementation, which is critical in reducing perinatal and maternal morbidity and mortality rates.³ Particularly in developing countries, the practice of PCC is almost non-existent. Consequently, unplanned pregnancies are prevalent, making it difficult to address pre-existing conditions or lifestyle factors affecting pregnancy outcomes. Previous studies have reported a range of 2.8% to 4.0% for major congenital abnormalities.^{4,5} PCC plays a vital role in reducing risk behaviours and exposures that can impact

fetal development and subsequent outcomes.⁶ However, it remains a neglected component of maternal and child healthcare services, serving as primary prevention for infants and secondary prevention for prospective mothers.⁷ Numerous factors contribute to the challenges faced in developing countries, including poor awareness among women and healthcare providers, low socioeconomic status, limited access to healthcare, illiteracy, and poor health-seeking behaviour.^{8,9}

Given the prevalence of unplanned pregnancies and the evolving nature of PCC, understanding women's knowledge, perceptions, and access to care is crucial. Addressing these gaps is essential to improve awareness and uptake of PCC, ultimately improving maternal and child health outcomes. This study aimed to assess the knowledge and make women aware of preconception care and its importance.

METHODS

We conducted this cross-sectional study at the department of obstetrics and gynaecology, BRDMC, Gorakhpur, Uttar Pradesh. We included 200 women of reproductive age who visited the gynaecology and obstetrics outpatient department (OPD) for infertility treatment, as well as patients with BOH conditions such as recurrent abortion, stillbirth, congenital anomalies, and preterm labour, as well as those with hypertension, diabetes mellitus, epilepsy, and chronic diseases such as cardiac disease. In contrast, women of reproductive age who have completed their families and those who do not wish to become pregnant were excluded from the study. The inclusion criteria-compliant women were interviewed according to the interview schedule. Ethics approval and informed consent were obtained. All the women were divided into three groups: group A (those coming for infertility treatment; n=50), B (those coming for bad obstetrics history; n=50) and C (term delivery with good or bad result; n=100). To acquire information, pre-structured questionnaires were distributed. Age, parity, residence, level of education, religion, marital status, and occupation were recorded as demographic data.

Additionally, gynaecological and family history were recorded. Specific knowledge regarding preconception care in the following areas: folic acid use and supplementation, nutritional status (underweight or overweight before pregnancy), risky behaviours that can influence the outcome of pregnancy (alcohol and smoking), maternal chronic conditions and their impact were documented. To identify any preconception risk factors, all participants in the study were educated on the significance of preconception care and medical conditions that affect pregnancy outcomes, such as recurrent pregnancy loss, preterm birth, intrauterine death, eclampsia, preeclampsia, and severe anaemia. Data obtained were analyzed using statistical package for the social sciences (SPSS) software version 22 and stated as frequency and percentages.

RESULTS

Of the 200 cases, most were aged between 18 and 25 (48%). The mean age of the participants was recorded as 26±2.7 years. The majority of the participants were Hindus (92%), housewives (80%), intermediate qualified (40%), living in rural areas (60%) and belonging to the lower middle class (48%). The maximum number of women (30%) came after 4 years of married life for assistance (Table 1).

Table 1: Socio-demographic parameters of enrolled patients (n=200).

Socio-demographic parameters	Number of cases	Percentage
Age (in years)		
18-25	96	48
26-30	60	30
>30	44	22
Educational status		
Illiterate	8	4
Primary school	28	14
High school	56	28
Intermediate	80	40
Graduate or above	30	15
Dwelling		
Urban	80	40
Rural	120	60
Religion		
Hindu	184	92
Muslim	16	8
Socioeconomics		
Upper class	16	8
Upper middle	30	15
Lower middle	96	48
Lower	58	29
Occupation		
Housewife	160	80
Service holder	8	4
Businesswomen	12	6
Labour	20	10
Married life (years)		
<1	50	25
1-2	42	21
3-4	48	24
>4	60	30

Most had primary infertility (52%). The most prevalent cause of infertility was pelvic inflammatory disease (PID non-tuberculosis) (40%), followed by genital tuberculosis (20%). PID was treated with antibiotics and anti-tubercular medicines treated genital tuberculosis. The majority of the husband of couples seeking infertility treatment were dependent on tobacco (32%) and alcohol (22%), respectively. Few of them were afflicted with diabetes mellitus (8%), obesity (12%), and hypertension (6%),

whereas 20% had no health issues whatsoever (Table 2). Most women with bad obstetrics history had abortions (34%) due to hypothyroidism (n=10). 32% of the cases had neural tube defect (Figure 1). Stillbirth occurred in 28% of the women, primarily owing to APLA (immunological factor; n=4) and hypothyroidism (n=4) (Table 3). Only one woman had both a preconception checkup and a suitable antenatal checkup. In contrast, 69 women had only a proper antenatal and no preconception checkup, and 30 women had neither a preconception checkup nor a proper antenatal check-up (Figure 2). 52 per cent of the fifty normal delivery cases had maternal morbidity. Anaemia (n=15) was the most prevalent maternal morbidity in vaginal delivery without prior conception, followed by preeclampsia, jaundice, and eclampsia. The majority of foetuses delivered vaginally were healthy (46%) (Table 4). Prior 1 LSCS was the most common reason for emergency caesarean section (n=16). Ninety per cent of women who had a caesarean section were in good health, followed by those who had preeclampsia and antepartum eclampsia. Sixty-two per cent of fetuses born via caesarean section were healthy (Table 5). 10% of the BOH patients conceived, and 6% gave birth (mother and child were healthy) (Figure 3). Of fifty infertile patients, 18% conceived, and 10% gave birth to healthy infants (Figure 4). Preconception was performed in 100 instances (50 BOH and 50 infertile). Eight of the 14 patients who conceived during the study period gave birth to healthy infants, and the mother was healthy too (Figure 5).

Table 2: Type and cause of infertility among patients (n=50).

Infertility	Number of cases	Percent
Type of infertility		
Primary	26	52
Secondary	24	48
Cause of infertility		
PID (non-tuberculosis)	20	40
Genital tuberculosis	10	20
PCOS	8	16
Hypothyroidism	6	12
Endometriosis	6	12
Treatment		
PID (non-tubercular)-antibiotics	20	40
Endometriosis-progesterone	6	12
Gen. tuberculosis- ATT	10	20
PCOS- inositol	8	16
Hypothyroidism- levothyroxine	6	12
Problem of husband in infertile couple		
Tobacco	16	32
Alcohol	11	22
DM	4	8
Overweight	6	12
No problem	10	20
HTN	3	6

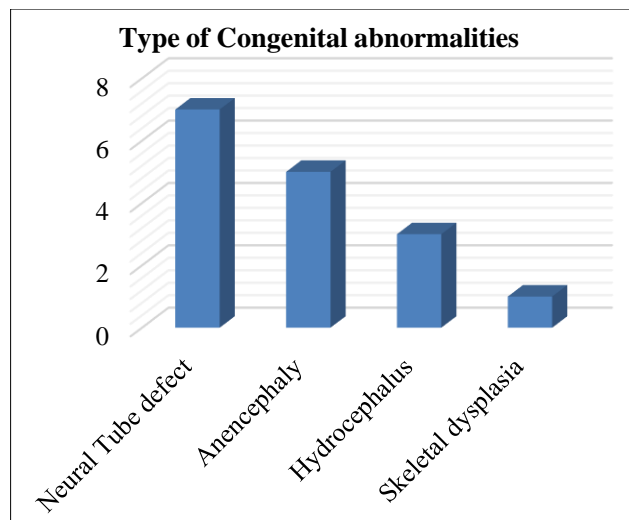


Figure 1: Types of congenital abnormalities in BOH patients.

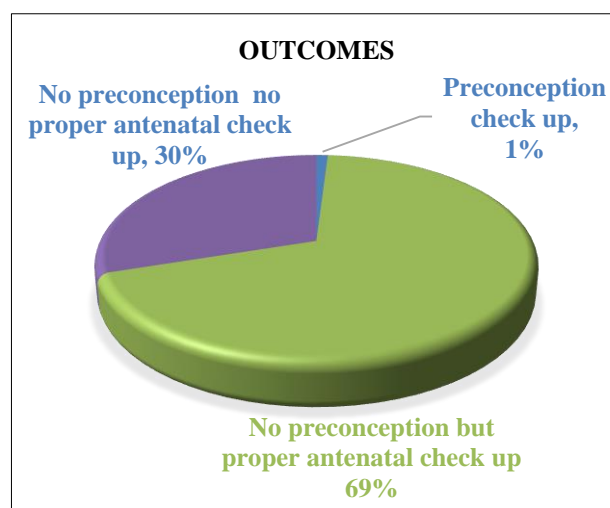


Figure 2: Total outcome in case of term delivery (LSCS and VD).

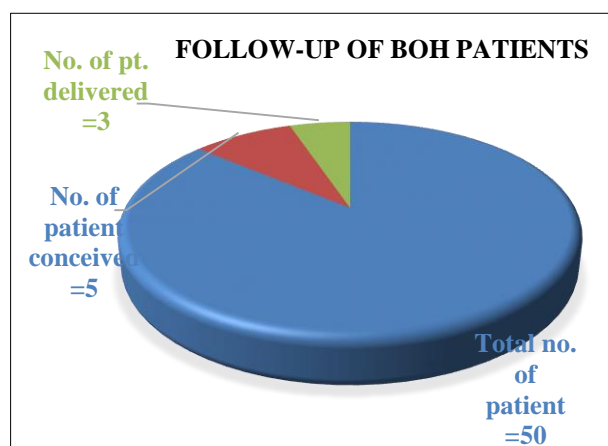


Figure 3: Follow-up of 50 BOH patient conceived after preconception check-up.

Table 3: Type and cause of bad obstetrics history and outcomes among patients.

Bad obstetrics history	Number of cases	Percentage
Type of BOH		
Abortion	17	34
PTLPs	3	6
Congenital abnormality	16	32
Still birth	14	28
Cause of abortion		
APLA (immunological factor)	1	5.88
PID	4	23.53
Hypothyroidism	10	58.82
Diabetes mellitus (uncontrolled)	2	11.76
Cause of stillbirth		
Preeclampsia (severe feature)	2	14.29
DM (uncontrolled)	2	14.29
APLA (immunological factor)	4	28.57
Hypothyroidism	4	28.57
No cause	2	14.29
Cause of congenital abnormalities		
TORCH (hydrocephalus) toxoplasmosis (1)	1	6.25
DM (uncontrolled)	2	12.50
GTCS (on antiepileptics)	3	18.75
Hypothyroidism	7	43.75
No cause	3	18.75

Table 4: Maternal and neonatal outcomes in vaginal deliveries.

Outcomes	Number of cases	Percentage
Maternal outcome		
Healthy mother	24	48
Maternal morbidity	26	52
Neonatal outcome		
Healthy	23	46
NICU	21 (18 - baby discharged, 3 expired due to respiratory distress)	42
IUD	6	12
Cause of maternal morbidity		
Anaemia	15	57.69
Preeclampsia	4	15.38
Jaundice	4	15.38
Eclampsia	3	11.54

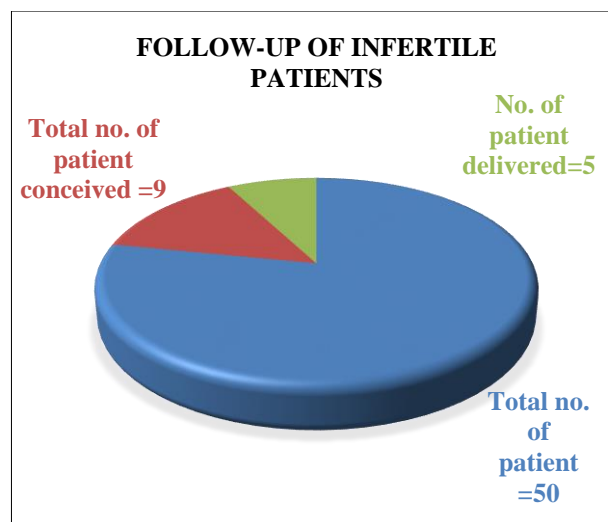


Figure 4: Follow-up of 50 infertile patients conceived after preconception check-up.

Table 5: Maternal and neonatal outcomes in emergency caesarean section.

Outcomes	No. of cases (9)	Percentage
Indications		
CPD	1	2.00
Breech	1	2.00
Previous 1 LSCS	16	32.00
Previous 2 LSCS	6	12.00
Fetal distress	9	18.00
Obstructed labour	5	10.00
Preeclampsia with severe feature	3	6.00
Placenta previa	3	6.00
Contracted pelvis	4	8.00
Ante partum eclampsia	2	4.00
Maternal outcome		
Good	45	90
Maternal morbidity	5	10
Neonatal outcome		
Healthy	31	62
NICU	19 (15 - discharged, 4 expired due to respiratory distress)	38
IUD	0	0
Cause of morbidity		
Preeclampsia with severe feature	3	6
Antepartum eclampsia	2	4

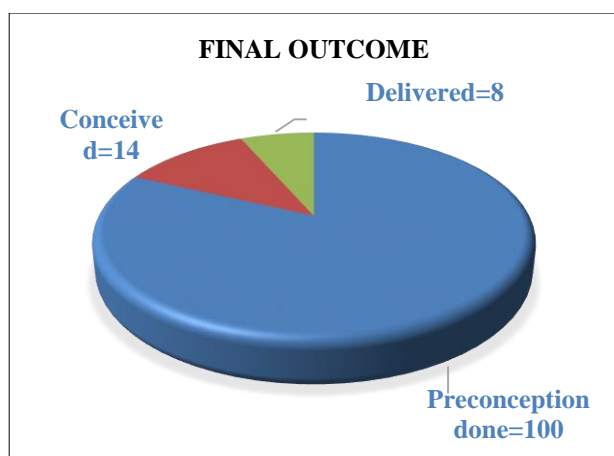


Figure 5: Final outcome of the enrolled patients after preconception check-up.

DISCUSSION

Maternal knowledge on preconception health care was studied at MoI teaching and referral hospital; 380 women became pregnant, 190 faced an unplanned pregnancy, 110 experienced complications, 40 had unsafe abortions, and 1 died.⁴⁰ Women's knowledge and associated factors on preconception care were studied by Ayalew et al, 422. Reproductive age women were selected for the study.¹⁰ 78% of cases in this study were below 30, and the rest, 22%, were above 30 years (mean age- 27.5 years). One study on preconception care was done by Gautam and Dhakal, where 43.6% of cases were below 30 years of age, and 56.4% were above 30 years old.¹¹ In the present study, 4% of women were illiterate, 81% had primary to intermediate education, and 15% were graduates or above. In the Study by Gautam and Dhakal, illiterate patients were 7.7%, primary education was 16%, and secondary and above education was 75.4%.¹¹ The maximum number of cases of our study (60%) belonged to rural areas, and the rest 40% belonged to urban areas. A study done by Madziyire et al showed that the incidence of cases belonging to rural areas was 4.6% and 66.7 % from urban areas; 28.7% were not stated.¹² The maximum number of cases in the present study were Hindu (92%), and the rest (8%) were Muslim. In the study by Gautam and Dhakal, the maximum number of patients were Hindu (96.03%), and 3.97% were Christians.¹¹ In our study, the maximum number of cases, i.e., 48%, belonged to the lower middle class, 29% to the lower class, and 23% to the upper and upper middle class. In the study by Madziyire et al, the incidence of low income was 4.2%, medium income was 28.0%, high income was 18.5%, and the remaining 64.0% was unstated.¹² In our study, 80% of the cases were homemakers, 20% were service holders, businesswomen, and labour. Similarly, Giri and Gautam observed that most cases (48.6%) were homemakers, while 4% were labour, 23.6% were agricultural, 15.9% were service holders, and 7.7% were from the business community.¹³ In our study, 70% of the cases came up within the first four years of marriage, while 30% showed up after four years.

According to a study conducted in Morocco, 65.2% of women came within the first five years of marriage, while 34.8% came after five years.¹⁴ In our study, most couples had primary infertility (52%), whereas 48% had secondary infertility. In the Tiagha AR et al. study, secondary infertility was more prevalent (69%).¹⁴ Maximum cases of infertility in the present study were due to pelvic inflammatory disease (PID), i.e., 60% (non-tubercular-40% and 20% tubercular). PCOS in 16%, hypothyroidism in 12%, and endometriosis in 12% were also recorded. According to Deshpande and Gupta, PCOS was the most common cause of infertility (46%).¹⁵ 40% of cases of infertility in the present study were due to PID, which responded to antibiotics; the rest 20% of cases of PID did not respond to either antibiotics or any other medicine; symptoms and signs of the patient disappeared after ATT medicine. In the present study, progesterone was administered to those with endometriosis (12%). In PCOS (16%) patients, inositol was recommended in addition to a healthy diet and regular exercise. Levothyroxine was administered (12%) to patients with hypothyroidism. We also observed that 32% of the husband were addicted to tobacco, followed by 22% who were addicted to alcohol, 12% were overweight, 8% had diabetes mellitus, 6% had hypertension, and 20% had no problem at all. Likewise, in a study by Sansone et al, 33% of husbands were tobacco addicted.¹⁶ Those who were addicted to alcohol and tobacco were asked to stop. Diet, exercise and medicine-controlled weight, DM and HTN, so all the problems were managed during preconception check-ups. In the BOH group, most cases (34%) had abortions, followed by congenital abnormalities (32%). Stillbirth was recorded in 28% and preterm labour pain in 6% of the cases in our study. In a study by Singh and Sidhu, preterm delivery was noted in 6.33%, recurrent pregnancy loss (1.4%) and stillbirth (3.87%).¹⁷ In the present study, 10 cases of abortion were due to hypothyroidism, 4 cases of abortion due to PID, 2 cases were aborted due to uncontrolled diabetes mellitus. In 1 case, an immunological factor was considered to be the cause. A similar observation was reported was another study.¹⁷ In the present study, in 4 of 14 stillbirths, immunological factors caused abortion, 2 had preeclampsia, 2 had uncontrolled diabetes, and 2 had normal investigations. Before pregnancy, hypothyroidism was managed with Levothyroxine, hypertension with labetalol, and diabetes with drugs, exercise, and diet. After correcting the problem, patients were asked to conceive and given heparin and aspirin during pregnancy in APLA. Joint national committee on prevention, detection, evaluation, and treatment of high blood pressure national institute of health publishing May 2003 and diabetes in pregnancy, management, and complications from preconception to the postnatal period. Clinical guidance 1.3.24.2015-NICE recommend treating all women's issues preconceptions.^{18,19} We also observed that seven of the sixteen cases of congenital malformation were characterised by neural tube defects, five by anencephaly, three by hydrocephalus, and one by skeletal dysplasia. Diabetes was managed, and folic acid was given during the preconception period. Women with epilepsy were

prescribed the safest antiepileptic medication, which was continued during pregnancy. Before pregnancy, TORCH was performed and treated. To reduce the risk of congenital malformation, all problems should be treated before pregnancy.²⁰ In the present study, only 1 patient had knowledge about preconception checkups, while the rest did not know about PCC. No proper antenatal check-up was done in 30 patients. In 69 patients, proper antenatal checkup was done. In the study by Gautam and Dhakal, the majority of the respondents, 162 (71.37%) had no information and 65 (28.63%) respondents had information regarding preconception care.¹¹ In term vaginal delivery, a preconception check-up was not done. Out of 50 normal delivery cases, 26 (52%) had maternal morbidity, 24 (48%) mothers were healthy in our study. The most prevalent cause of morbidity was anaemia, jaundice, preeclampsia and eclampsia. During preconception care, anaemia, and high BP, should be corrected. If a patient has jaundice, she should conceive after the liver function test becomes normal. In the study of Prual et al, maternal morbidity was reported in 6.17 per 100 pregnant women. Direct causes of maternal morbidity were haemorrhage 3.05 per 100 pregnant women, hypertensive disorder 64 per 100 pregnant women, eclampsia 19 per 100 pregnant women, and obstructed labour 2.05%. Case fatality rate was very high for sepsis (33.5%), antepartum or peripartum haemorrhage (1.9%) and abruptio placentae (3.7%).²¹ In our study, 46% of neonates were healthy, 42% had morbidity, they needed NICU admission, and 6 (12%) had stillbirth. These patients had neither preconception check-ups nor proper antenatal check-ups. In a study conducted by Klingenberg et al of 27 neonates admitted for perinatal asphyxia, 11 (47%) neonates died, and 19 infants with gestational age <31 weeks died; however, this complication was reduced by treatment in more than two-thirds of infants treated with antibiotics.²² All 50 cases of cesarean section came in an emergency in our medical college; ideally, all women were candidates for elective cesarean section, not emergency cesarean section. These women were told to have preconception checkups before their future pregnancies. Out of cesarean delivery of 50 cases, only 5 cases had maternal morbidity, 3 had preeclampsia with severe features, 2 cases developed eclampsia. High BP was treated by hypotensive drugs before conception in the preconception period. 31 (62%) neonates were healthy, 19 (38%) neonates required NICU admission, 4(8%) expired, and 15 (30%) survived. In all 50 BOH patients who underwent preconception screening. The factors causing BOH were addressed. 5 out of 50 women conceived, and 3 out of 5 delivered a healthy newborn and mother. In 50 cases of infertility that were treated, a preconception exam was performed; 9 patients conceived; and of the 9 (18%) women who conceived, 5 (10%) have since given birth. The mother and newborn were both healthy. Preconception was performed in 100 instances (50 BOH and 50 infertile). Eight of the 14 patients conceived during the study period delivered healthy infants. So, a preconception check-up provides an excellent result.

CONCLUSION

The combination of preconception care and routine antenatal care can only reduce maternal and foetal morbidity and mortality. Before conceiving, high blood pressure, thyroid issues, diabetes, and any infection in the body should be treated with safe medications. Only essential medications should be administered to women during the preconception and antenatal stages. Prior to becoming expectant, haematological, immunological, or genetic issues should be addressed so that the pregnancy can be managed accordingly. If preconception care is not taken, a woman should not become pregnant. If we adhere to the instructions above, we can reduce maternal and foetal morbidity and mortality.

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