



Study of Feasibility of Blood Pressure Monitoring in Postpartum Women by Teleconsultation in COVID 19 Pandemic Situation

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Abstract

Purpose of the Study To study the feasibility of blood pressure monitoring and to assess the feasibility of antihypertensive dose adjustment in postpartum women by teleconsultation in COVID 19 pandemic situation.

Methods This was a descriptive longitudinal study conducted in the Department of OBGY, GMCH, Aurangabad between the study periods November 2020 to April 2021 with a sample size of 60. The feasibility of blood pressure monitoring in postpartum women by teleconsultation was measured by recruitment and retention through 12 weeks postpartum. The feasibility of anti-hypertensive dose adjustment through teleconsultation was measured by the number of women requiring hospital visit for uncontrolled blood pressure or those with warning signs and symptoms. The data were collected and analyzed.

Results The feasibility of blood pressure monitoring in postpartum women by teleconsultation was 95.23%. During follow-up, the antihypertensive drug dose was required to be increased in 3 women. Not a single woman required hospital visit or hospital readmission either due to uncontrolled hypertension or warning signs/symptoms. This indicates that the feasibility of anti-hypertensive dose adjustment by teleconsultation was good.

Conclusion We demonstrated feasibility and over all good satisfaction rate of Blood Pressure Monitoring in postpartum women by teleconsultation in COVID 19 pandemic situation and found that teleconsultation is a boon in management for postpartum hypertension to reduce readmissions and decrease maternal morbidity while ensuring social distancing and minimizing viral exposure. We recommend teleconsultation as a quality improvement initiative in maternity care.

Keywords Teleconsultation · Postpartum · Blood pressure monitoring · Hypertensive disorders in pregnancy · COVID19 pandemic

Introduction

Hypertensive disorders of pregnancy (HDP) remain among the most significant and intriguing unsolved problems in obstetrics. In India, the prevalence of HDP was 7.8% with pre-eclampsia in 5.4% of the study population [1]. The majority of research has focused on antenatal management

of hypertension in pregnancy; therefore, there is very little information on how to best manage postpartum hypertension, regardless of type or severity to optimize maternal safety [2]. Postpartum, it is not uncommon for normotensive women to have a physiologic increase in blood pressure [3, 4]. Furthermore, in an observational study in hypertensive women with or without proteinuria, many of the women had an initial decrease in blood-pressure (BP) after delivery, followed by a rise to hypertensive levels between days 3 and 6 postpartum [4, 5]. This increase typically occurs after the woman is discharged from the hospital. The exact reason for exacerbation of hypertension between days 3 and 5 is not exactly known, but it can have serious consequences such as stroke and rarely death [4, 6]. The American College of Obstetricians and Gynaecologists (ACOG) guidelines suggest blood pressure monitoring in the hospital or that equivalent outpatient

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surveillance be performed for at least 72 h postpartum and 7–10 days after childbirth or earlier in women with symptoms who had gestational hypertension, preeclampsia, or superimposed preeclampsia [7]. Cost-effective interventions are needed to identify women at risk for severe postpartum hypertension, support optimal blood pressure follow-up, and self-management. Our institute is a tertiary care centre catering patient from 12 nearby districts. As majority of cases were referred from rural area, monitoring of blood pressure in postpartum women may be a difficult task especially in this pandemic era. Repeated follow-up visits in hospital may not be possible. At the same time, if the women were counselled regarding the importance of blood pressure monitoring and dose adjustment of antihypertensives in postpartum period, they may be ready for follow-up, but it will be difficult for them to get specialist care for solving their problem. There is emerging data on the feasibility and satisfaction of home blood pressure monitoring for postpartum women with a hypertension-related pregnancy disorder [8]. If she gets her blood pressure monitored at home and if conveyed her BP readings on telephone or WhatsApp to specialist, it will help her to have improved outcome. Keeping this in mind we conducted a study to investigate the feasibility of teleconsultation with blood pressure monitoring with digital BP apparatus at home for management of hypertension in postpartum women at risk of severe or exacerbation in hypertension after hospital discharge.

Aims & Objectives

- To study the feasibility of BP monitoring in postpartum women by teleconsultation in COVID 19 pandemic situation.
- To assess feasibility of antihypertensive dose adjustment through telemedicine
- To study the pattern of BP normalization at home.
- To determine number of women requiring hospital visit for uncontrolled blood pressure or warning signs and symptoms.

Material & Methods

This was a descriptive longitudinal study conducted in the Department of OBGY, GMCH, Aurangabad between the study period November 2020 to April 2021.

A sample size of 60 was estimated to achieve a desired precision in the estimated recruitment and consent rates to within a 95% confidence interval of $\pm 11\%$ or 14% assuming 10% drop-out by Cochrane formula [9].

Inclusion Criteria

Women who underwent vaginal delivery with HDP without any complication and willing to participate in the study and having digital BP apparatus and mobile phone with WhatsApp application at home. Birth companion willing to record BP and inform obstetrician.

Exclusion Criteria

Postnatal women with eclampsia or HDP with complications, those not willing to participate in the study, women who underwent cesarean section, women readmitted to hospital for neonatal complication.

After the permission of Institution Ethics Committee and after applying inclusion and exclusion criteria, women were recruited in the study. Informed valid consent was obtained after making her aware about the purpose of the study. Her contact details were recorded. At the same time, she and her birth companion were made aware about the contact number/WhatsApp number of Obstetrician for communication. Her birth companion was trained for home monitoring of blood pressure by digital BP apparatus and danger sign and symptoms. The birth companion was trained during the hospital stay of mother daily for 30 min session for consecutive 3 days. She was trained about the parts & application of digital BP apparatus, the position of woman while taking BP and sending the reading on WhatsApp of Obstetrician. She was allowed to record BP of 5 women under supervision of junior resident who confirmed her findings. One day prior to discharge, she was allowed to record BP of her own case. The information pertaining to her sociodemographic data including parity, maternal age, socioeconomic status by Modified Kuppuswamy scale, educational status and gestational age at the time of delivery was recorded. The antihypertensive drug & its dose was noted. After delivery daily recording of blood pressure was done by the trained companion along with enquiry of warning signs & symptoms. The antihypertensive drug was started and continued as per SOPs of the department. If blood pressure is normal or controlled on antihypertensives, woman was discharged on Day 5 from the hospital. She was asked to record blood pressure on Day 10, Day 15, Day 30, Day 45 and Day 60 of hospital discharge or earlier if she develops warning sign & symptoms. She was made aware about the date and time of BP recording. If her BP was $< 140/90$ mm of Hg, she was advised to reduce the dose of antihypertensives. If her BP reading was $< 130/80$ mm of Hg, antihypertensives was stopped with frequent BP recording on daily basis for 2 days. If her BP reading was $> 150/100$ mm of

Hg, antihypertensive dose was increased. If her BP was between 140–150/100–90 of Hg, the same dose of antihypertensive continued [10]. Women with warning signs and symptoms were directed to come for the hospital admission & further evaluation. Each participant completed a routine 12-week postpartum clinic visit, which was the study endpoint. The dimensions of the questions covered were perception of quality of care received, ease of getting blood pressure checked up, ease of use/ease to learn the teleconsultation, and problems encountered while participating in the study. The survey utilized a variety of question formats including Likert scales with response ranging from 1 to 5. Regarding economic concerns, this study requires the use of a ‘digital BP apparatus’ which is available for a moderate price and a phone or digital application like ‘WhatsApp’ which entails a minimum amount only.

The feasibility of blood pressure monitoring in postpartum women by teleconsultation in Covid pandemic situation was measured by recruitment and retention through 12 weeks postpartum. The feasibility of anti-hypertensive dose adjustment through telephonic consultation was measured by the number of women requiring hospital visit for uncontrolled blood pressure or warning signs and symptoms. All data were analyzed using SAS version 9.4 with appropriate statistical test.

Observations

Amongst 4948 women who underwent delivery during the study period, 156 women with HDP were approached for the study participation. Out of them, 63 women agreed to participate in the study, resulting in a consent rate of 40.38%. Out of 63 women, three women opted out of the study before 90 days. One woman opted out on day 15 of follow-up due to NICU admission of the baby and two women opted out at day 30 of follow-up due to lack of support from their families. The feasibility of blood pressure monitoring in postpartum women by teleconsultation was 95.23% (Fig. 1).

Baseline demographics and clinical characteristics of the participants are summarized in Table 1.

During follow-up, the antihypertensive drug dose was required to be increased in three women. Not a single woman required hospital visit or hospital readmission due to either uncontrolled hypertension or warning signs/symptoms. This indicates that the feasibility of anti-hypertensive dose adjustment by teleconsultation was good (Table 2).

Majority of women (57, 95%) stopped requiring antihypertensives by day 30 of follow-up (Table 3).

Out of 60 women who completed the total follow-up, 50 (83.3%) were satisfied with home monitoring of blood pressure by teleconsultation. Not a single woman was unsatisfied with teleconsultation (Table 4).

Discussion

In the wake of COVID-19 pandemic, the Ministry of Health and Family Welfare has recently come forth with Telemedicine Practice Guidelines that clearly states the role and limitations of teleconsultations [11].

The new guidelines by ACOG replace the 6-week postpartum visit with 12 weeks of ongoing support, tailored to the needs of each individual woman. For patients who prefer to receive care at home, require continual monitoring, or live in rural or underserved areas, telehealth is a great option [12].

By utilizing teleconsultations, we were able to provide appropriate care and counselling, while reducing the surge of outpatient visits. The limitation of the study was the sample selection is purposive. Our study was an effort to show the feasibility of teleconsultation in home monitoring of blood pressure in postpartum period to prevent maternal morbidity as well as overcrowding and cross infection. Our study also demonstrated the feasibility of teleconsultation for home monitoring of blood pressure was around 95% and not a single woman required hospital readmission or had any complication due to uncontrolled hypertension. A recent non-randomized control trial found that telehealth with remote monitoring allowed for earlier detection and significant reduction of hospital readmission among postpartum patients with hypertension [13].

Telemedicine has provided us the opportunity to manage women health problems and pregnancy concerns during this pandemic of COVID-19, except a few instances where face-to-face consultation or hospital visit is must. If we implement the triage pathway, we can minimize the risk of exposure for both patients and healthcare teams during COVID-19 pandemic [14].

Telehealth identified hypertension complications prior to the recommended follow-up time, and that participant preferred home monitoring over clinic monitoring. This single cohort feasibility study consisting of 55 participants, evaluated postpartum telehealth intervention for blood pressure management after discharge. There were no hospital readmissions during the study period [4].

Teleconsultation is one solution to improve the access barrier that many women experience. By making the woman and her companion aware and educated about postpartum blood pressure monitoring by digital blood pressure along with warning signs and symptoms, postpartum women can receive quality health care regardless of location.

Our Satisfaction survey developed for evaluation of the participants experience utilizing this specific teleconsultation also reported that women were satisfied with teleconsultation.

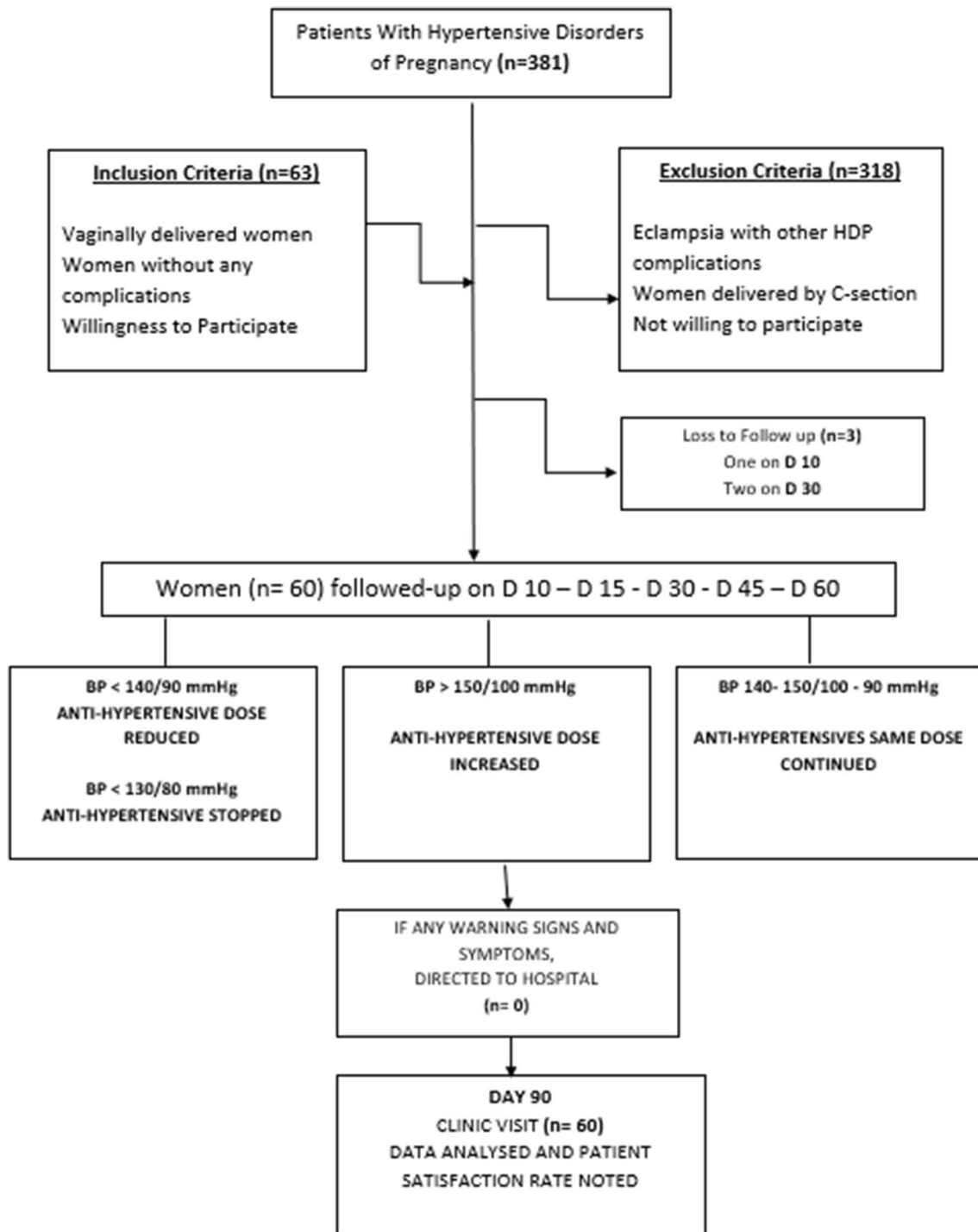


Fig. 1 Methodology for feasibility of BP monitoring in postpartum women by teleconsultation

Conclusions

We demonstrated feasibility and over all good satisfaction rate of BP Monitoring in postpartum women by teleconsultation in COVID 19 pandemic situation and found that teleconsultation is a boon in management for postpartum hypertension to

reduce readmissions and decrease maternal morbidity while ensuring social distancing and minimizing viral exposure. We recommend teleconsultation as a quality improvement initiative in maternity care minimizing viral exposure. We recommend teleconsultation as a quality improvement initiative in maternity care.

Table 1 Baseline characteristics of study participants

Characteristics		Frequency <i>n</i> = 63	Percentage
Age (in years)	Mean ± SD	25.74 ± 5.68	–
	Range	19–42	–
Parity	Primipara	42	66.64
	Multipara	21	33.36
Socioeconomic status	Class 3	43	68.26
	Class 4	20	31.74
Type of HDP	Severe pre-eclampsia	16	25.40
	Gestational hypertension	47	74.60

Table 2 Feasibility of antihypertensive drug dose adjustment

Follow up day/total number of women	Same dose maintained	Dose reduced	Dose increased	Dose stopped
10 (<i>n</i> = 63)	29	31	3	0
15 (<i>n</i> = 62)	5	26	0	31
30 (<i>n</i> = 29)	1	2	0	26
45 (<i>n</i> = 3)	0	1	0	2
60 (<i>n</i> = 1)	0	0	0	1

Table 3 Pattern of normalization of blood pressure

Day of Stoppage of antihypertensives	Frequency <i>n</i> = 60	Percentage %
10	0	0
15	31	51.66
30	26	43.33
45	2	3.40
60	1	1.66

Table 4 Satisfaction rate with home monitoring of blood pressure by teleconsultation

	Frequency	Percentage <i>n</i> = 60
1. (Very unsatisfied)	0	0
2. (Unsatisfied)	0	0
3. (Neutral)	10	16.7
4. (Satisfied)	22	36.6
5. (Very satisfied)	28	46.7

Declarations

Conflict of interest The authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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