

Delivery Outcomes for women using Home Blood Pressure Monitoring

Dr Roisin Devlin ST2, Dr Jess Gomersall Consultant

INTRODUCTION

The unprecedented Covid-19 pandemic has presented challenges to maternity services; but has also provided us with the opportunity to change the conventional models of care and introduce service improvements with innovative adaptations, as we endeavour to improve our standards of care. One of these adaptations has been how we monitor blood pressure in at risk women, typically those with essential or gestational hypertension.

At the outset of the pandemic, the Royal College of Obstetricians and Gynaecologists (RCOG) released guidelines introducing self-monitoring of blood pressure for this cohort of women. The Royal Jubilee Maternity Service (RJMS) was the first in the province to implement these guidelines. Women who met the aforementioned criteria and were deemed suitable were loaned a home blood pressure monitor (HBPM) and educated on using it, as well as self testing their urine for protein, negating the need for repeat hospital attendances. They were taught to record their blood pressure on charts, and provided with an individualised care plan with a colour coded flow chart on who to contact if the blood pressure reading was outwith the target range.

AIMS

The aim of these retrospective audits was to compare clinical outcomes between women who used home blood pressure monitoring, and a retrospective group of those who would have been eligible to use the HBPM service had it been available, based on parameters set out in previously existing literature.

METHODS

We based our study on the aforementioned guidance from the RCOG; but also on Dr Asma Khalil's recent publications on monitoring blood pressure in pregnancy. A proforma was drawn up assessing a number of different parameters regarding delivery outcomes. Retrospective data collection was carried out on two separate cohorts of patients; 1 cohort from April – June 2020 when HBPM was introduced for 3 months, and one from the same time frame in 2019 to avoid any seasonal variation, prior to the introduction of HBPM. There were 40 patients identified in each cohort. The patients to be included in the study were identified using a record book of HBPM users kept in the Day Obstetric Unit (DOU), and by generating a NIMATS search using the keywords "hypertension", "gestational hypertension", "essential hypertension", "pre-eclampsia" and "pregnancy induced hypertension". ECR was used to find the relevant information once the cohorts had been identified.

RESULTS

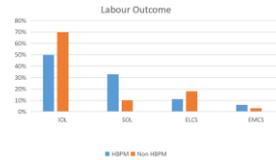
80 patients were included in the audit – 40 in each cohort. Our data breakdown is as follows;



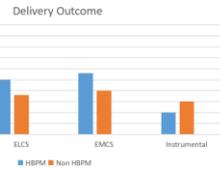
CONTACT

Roisin Devlin
Belfast Health and Social Care Trust
Roisin.devlin@belfasttrust.hscni.net

The HBPM group has a higher incidence of delivering at 39+ weeks.



There is a clear difference in induction of labour (IOL) rates between the two cohorts – 70% vs 50%; showing a clear reduction in IOL if the HBPM service was used. Of those induced; 28 were induced for PIH in the non HBPM group, which is the sole indication in this group, compared to 11 in the HBPM group, (just over half of the total number of inductions within this cohort).



There was a higher rate of a NVD in the cohort of women who did not use the HBPM service, and a higher number of women underwent an emergency c/s in the HBPM group compared to the non service users.

20% of babies in the non HBPM group were admitted to NNU compared to just 5% in the HBPM group. (Chart 1)

There is a clear difference in the diagnosis of Pre eclampsia (PET) – 35% compared to just 13% – a possible indication that HBPM can detect PET at earlier stages in pregnancy. (Chart 2)

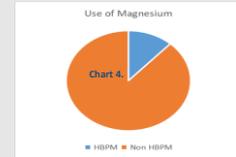
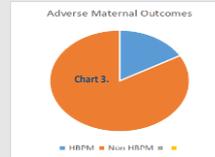
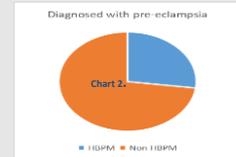
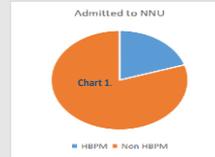
Antenatal admissions and durations of these appear broadly similar across both cohorts; in the HBPM service user group 30 patients had no antenatal admissions compared to 28 with no antenatal admissions in the non HBPM group. The limitations of data collection methods have meant it is not possible to differentiate the indication for antenatal admission.

There does appear to be a slight reduction in the length of postnatal stay in the HBPM service user group.

There was a lower incidence of adverse outcomes for mothers in the HBPM user group – 5% compared to 25% in the non service user group (Chart 3). Examples of adverse events included, PPH, sepsis and one case of abruption in the non HBPM user cohort.

The abruption occurred in a patient with severe pre eclampsia who was admitted at 36+5/40 – she was given MgSO4 for this reason. There was fetal compromise on an abnormal CTG, and was delivered via EMCS.

The most notable adverse outcome for the baby was in the non HBPM cohort; very sadly this was an IUD. The placental histopathology of this baby showed a haemodynamic compromise with a nuchal cord and a true cord knot. There was evidence of fetal thrombotic vasculopathy and mild chorioamnionitis. This patient had been on Labetalol since 28/40 due to PIH and high dose aspirin since booking.



DISCUSSION

This audit supports the literature that demonstrates HBPM reduces the incidence of IOL and diagnosis of pre eclampsia. There was a halving of number of IOL for hypertensive disease. The anticipated reduction in antenatal admissions from the published literature was not demonstrated; possible explanations were the limitations of our data collection methodology and the small size of the cohort. The anticipated next phase of this project is to extend the remit of home blood pressure monitoring into the postnatal period. The challenges of bridging the overlap of responsibility between primary and secondary care may be overcome with the continuity of care model of midwifery care, extended hours of DOU, electronic prescribing and digital communication developments in progress. Home blood pressure monitoring in pregnancy is a safe and effective choice for women. The reduction in unnecessary hospital and primary care attendances have clear benefits for women in reducing time and travel expenditure and promoting autonomy in managing their own condition as well as financial & logistical benefits to the services.

REFERENCES

- Self monitoring of blood pressure in pregnancy: information for health professionals. London: Royal College of Obstetricians & Gynaecologists; 2005. Available at: https://www.rcog.org.uk/guidance/documents/fulltextpdf/pdf/pdf/monitoring_blood_pressure_in_pregnancy.pdf. Accessed December 20, 2020.
- Kaplan E, Levin E, Ehrlich A, Thirugottanar B, et al. Pregnancy outcomes following home blood pressure monitoring in pre-eclampsia. *Hypertension Pregnancy*. 2015; 34:18-25. doi: 10.1002/hp.2013.03026
- Fang H, Shewhan L, Thirugottanar B, et al. 2018. Home blood pressure monitoring in a hypertensive pregnant population. *Ultrasound Obstet Gynecol*. 51: 529-530. <https://doi.org/10.1002/ug.9927>
- Lawrence S, Vandenbroucke I, et al. Remote Monitoring of Hypertension in Pregnancy: A Pilot Study. *ARR Obstet Gynecol*. 2017 Nov 6;5(2):45. doi: 10.2196/arrw.002. PMID: 29279968. PMCID: PMC5364241.