

Outcomes of Outpatient and Home Blood Pressure Monitoring in High-Risk Antenatal Women

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BACKGROUND AND AIMS

Hypertension, a leading cause of maternal long-term consequences and death in the UK¹ has also been associated with adverse foetal outcomes such as disruption of neurodevelopment². Home blood-pressure monitoring (HBPM), a practice introduced during COVID pandemic, has the potential for prompt recognition of hypertensive disorders and reduce additional antenatal visits.

Studies regarding HPBM during pregnancy in high-risk patients showed no significant difference in maternal or foetal outcomes compared to clinical monitoring, however, a preference was noted in favour of self-monitoring due to ease of use, self-empowerment and reduced anxiety³. As there are limited studies available regarding the maternal and foetal outcomes associated with HBPM compared with clinic monitoring, further research to explore the safety and efficacy of self-monitoring is warranted.

AIMS:

The aim of the study is to compare the maternal and fetal outcomes of women at high risk of pre-eclampsia who received home BP monitoring (during COVID) and those who received clinic-based monitoring (pre-COVID).

METHODS

Demographics and outcomes were recorded via BadgerNet from Epsom and St Helier University hospitals. Women were identified according to NICE guidelines; those with 1 high risk factor or >1 moderate risk factor for pre-eclampsia were recruited⁴. **103** patients were identified as high risk for pre-eclampsia pre-COVID (before March 2020, **outpatient group**) and **142** patients were identified as high-risk for pre-eclampsia during the COVID period (March 2020-February 2021, **HBPM group**).

Maternal outcomes focused on:

- pregnancy and adverse maternal outcomes
 - eclampsia, placental abruption, maternal morbidity (including serious CNS, cardiorespiratory, hepatic, renal or haematological morbidity)
- time taken to first raised BP reading (>140/90mmHg)
- number of extra antenatal hospital visits and length of post-natal hospital stay

Demographics and incidence of small for gestational age (SGA) neonates were compared between ethnicities. **Foetal outcomes** included preterm delivery, perinatal mortality, neonatal death, serious neonatal morbidity, SGA (<10th centile), and intrapartum or antepartum death.

RESULTS

Characteristics	HBPM (n = 142, %)	Outpatient (n=103, %)
Average Maternal Age (years)	35.3 (19-50)	33 (19-48)
Average Body Mass Index (kg/m2)	29.5 (18.06-50.6)	29.9 (19.85-47.46)
Average Parity	2 (1-6)	2.33 (1-7)
Ethnicity		
British	105 (73.9)	70 (67.9)
Afro-Caribbean	6 (4.2)	1 (1)
South Asian	7 (4.9)	9 (8.7)
Mixed	5 (3.5)	5 (4.9)
White - Other	14 (9.8)	10 (9.7)
Asian - Other	3 (2.1)	4 (3.9)
Other	2 (1.4)	4 (3.9)
Intial diagnosis (prior to HBPM)		
Chronic Hypertension	19 (13.3)	20 (19.4)
White-coat hypertension	2 (1.4)	1 (1)
History of pre-eclampsia	36 (25.4)	40 (38.8)
Pregnancy induced hypertension	17 (12.0)	30 (29.1)
Final Diagnosis		
Chronic Hypertension	20 (14.1)	7 (6.8)
White-coat hypertension	0	0
Pre-eclampsia	10 (7.0)	23 (22.3)
Pregnancy induced hypertension	22 (15.5)	10 (9.7)
Normotensive	78 (54.9)	63 (61.2)

Figure 1: Table comparing patient demographics and maternal outcomes between patients in HBPM group and outpatient monitoring groups.

More than twice as many patients developed pre-eclampsia in the outpatient group (22.3% vs 7.0%, *Figure 1*). There was no difference in other demographics or incidence of adverse maternal outcomes between the HBPM and outpatient group (*Figure 1*).

16.9% of the HBPM group had an SGA baby compared to 11.6% in the outpatient group; there were no associations between ethnicities.

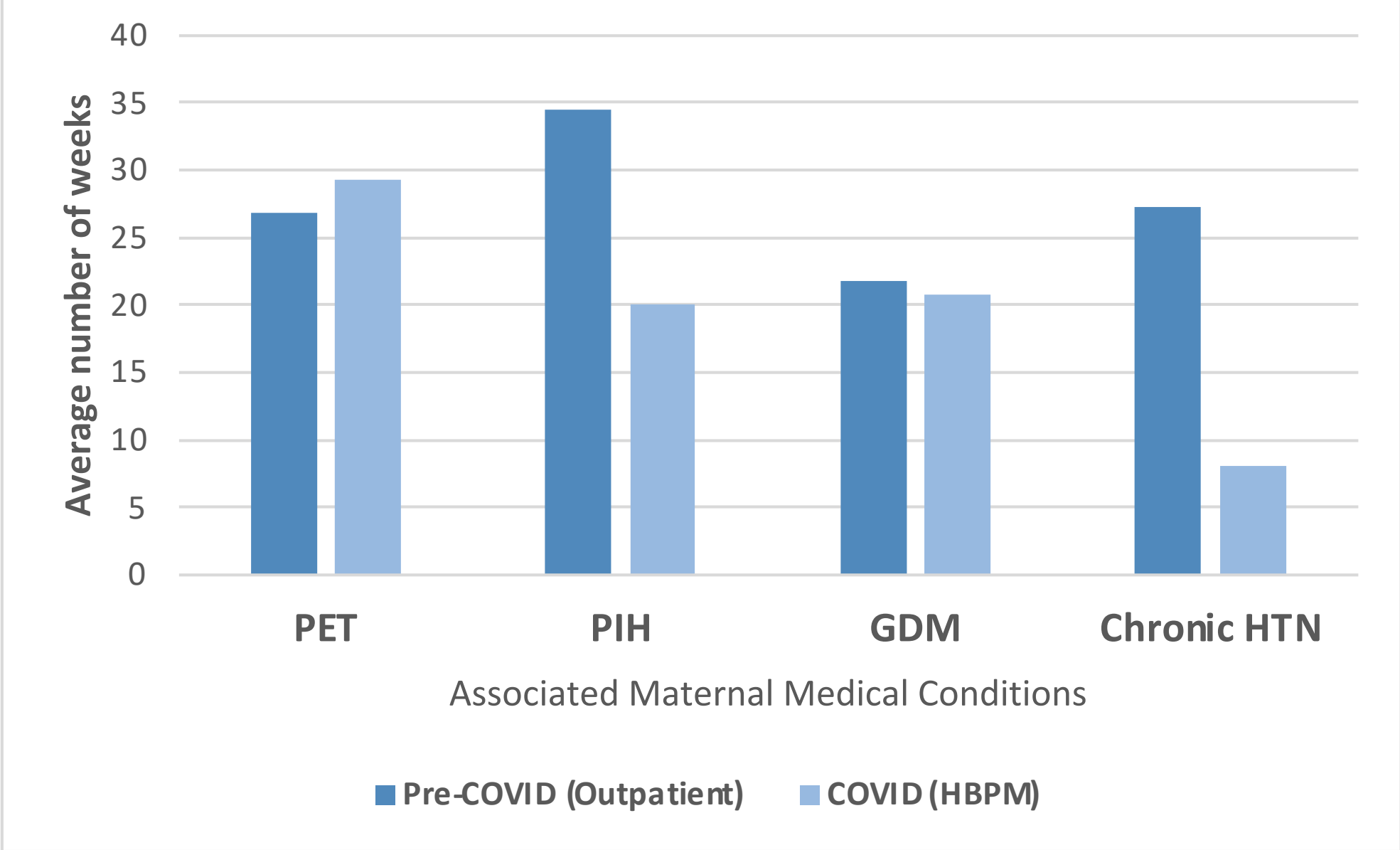


Figure 2: Graph comparing adverse maternal outcomes and time taken to raised BP (weeks) between HBPM and outpatient monitoring groups.

It took an average of 14.45 weeks longer in the outpatient group to recognise an initial rise in BP compared to HBPM in those with a final diagnosis of pregnancy-induced-hypertension (34.5 vs 20.05 weeks, *Figure 2*).

The HBPM group had fewer extra antenatal hospital visits compared to outpatient monitoring (1.87 vs 3.91 visits). There was no difference in the length of post-natal hospital stay between the two groups (*Figure 3*).

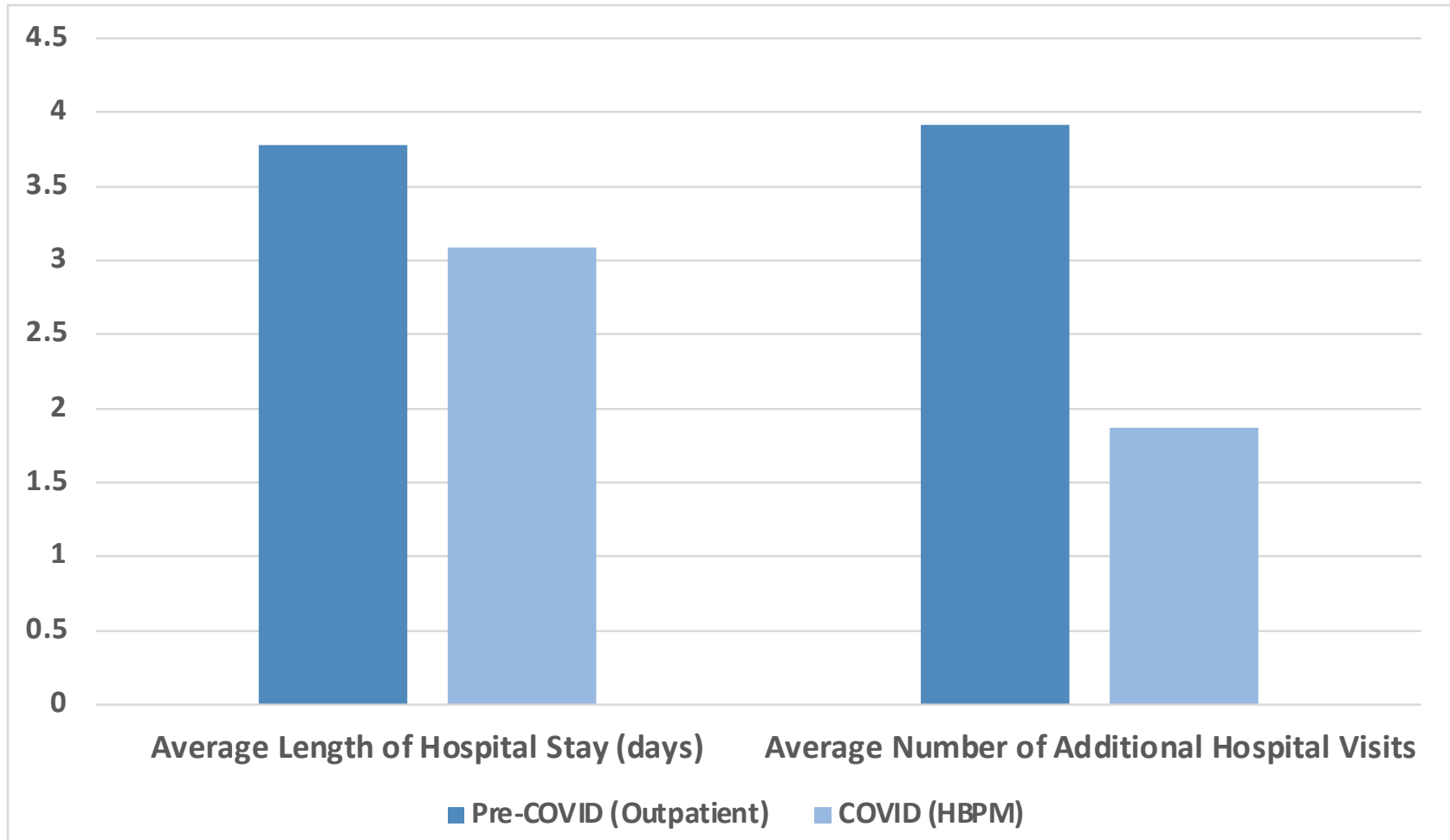


Figure 3: Graph comparing average length of post-natal hospital stay and additional antenatal appointments (due to reduced foetal movements, raised BP, and symptoms of pre-eclampsia) between HBPM and outpatient monitoring groups.

DISCUSSION & CONCLUSION

In the HBPM group, an initial rise in BP was recognised earlier than the outpatient group. Detection of high BP earlier on in pregnancy could result in fewer patients developing pre-eclampsia, as reflected in our study. Previous studies showed a reduction in health-associated anxiety when using HBPM³. This is especially pertinent following the COVID pandemic as an increase in missed appointments has been seen¹. A shift towards HBPM would somewhat mitigate this whilst still ensuring regular BP monitoring, potentially resulting in fewer extra antenatal hospital visits, as shown in our study. A higher incidence of SGA babies in the HBPM group warrants further studies exploring the impact of HBPM on foetal complications.

Limitations:

A larger sample size will improve the validity of the findings. There may not be optimal patient education, technique, and compliance which may have confounded our data. Awareness of early warning signs may also affect HBPM measurements.

Further research is required for successful implementation of HBPM and to address unresolved issues such as the confounding variables mentioned above as well as monitoring schedules and target values⁶.

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