Original Research Article

SAGE Open Medicine

SAGE Open Medicine
Volume 9: 1–10

DOI: 10.1177/20503121211032480
journals.sagepub.com/home/smo
SAGE

'I wish my body was stronger': A qualitative study of attitudes and behaviours regarding treatment of hypertensive disorders of pregnancy

Amyna Helou[1], Kay Stewart[1], Kath Ryan[2] and Johnson George[1]

Abstract

Objectives: To investigate pregnant women's attitudes and behaviours towards hypertensive disorders of pregnancy and their treatment.

Methods: Face-to-face, in-depth interviews were undertaken with 27 pregnant women diagnosed with and being treated for hypertensive disorders of pregnancy to investigate attitudes and behaviours regarding the conditions and their treatment. Written consent was obtained individually from each participant, and the interviews ranged from 16 to 54 minutes. Data collection was continued until thematic saturation was reached. Thematic analysis was employed to interpret the data.

Results: Four major themes emerged around beliefs and behaviours of pregnant women regarding treatment of their hypertension: understanding of hypertensive disorders of pregnancy and their implications, risks versus benefits of antihypertensive medication during pregnancy, trust in medical professionals and adherence to medication. The women's level of understanding of hypertensive disorders of pregnancy and their implications determined whether they were able to make informed decisions about their treatment. Prior experiences and concern for preservation of the pregnancy played major roles in the perception of the risk/benefit balance of using antihypertensive medication during pregnancy. The degree of trust in the treating medical professionals varied according to the perception of their confidence and knowledge.

Conclusions: Sound understanding of the condition, a positive risk/benefit balance regarding antihypertensive medication use during pregnancy, and trust in medical professionals contributed to adherence to medication. Good communication with healthcare professionals is important to achieve optimal treatment.

Keywords

Hypertension, pregnancy, obstetrics/gynaecology

Date received: 28 January 2021; accepted: 24 June 2021

Introduction

Hypertensive disorders of pregnancy (HDP) affect 10% of pregnancies in Australia[1] and are a leading contributor to maternal mortality and major morbidity worldwide.[2]

There are three main subtypes of HDP:[1] chronic hypertension, which is diagnosed either prior to pregnancy or before 20 weeks gestation. This can be either primary (no known cause) hypertension or secondary (known cause) hypertension; gestational hypertension which is diagnosed after 20 weeks gestation and preeclampsia which is defined as a multi-organ gestational disorder involving hypertension that can occur as a stand-alone disorder or superimposed on chronic hypertension. This can be either mild or severe. HELLP (Haemolysis, Elevated Liver enzymes, Low Platelet count) syndrome presents in a subset of women with severe preeclampsia with or without other preeclamptic features.

[1]Centre for Medicine Use and Safety, Faculty of Pharmacy and Pharmaceutical Sciences, Monash University, Melbourne, VIC, Australia
[2]School of Pharmacy, University of Reading, Reading, UK

Corresponding author:
Dr Johnson George, Centre for Medicine Use and Safety, Faculty of Pharmacy and Pharmaceutical Sciences, Monash University, Melbourne, VIC 3052, Australia.
Email: johnson.george@monash.edu.

Eclampsia is a rare and serious extension of preeclampsia involving maternal convulsions.[1]

Studies exploring the experiences, attitudes and behaviours of pregnant women with HDP during pregnancy have been scarce. The aspects that have been investigated include experiences of hospitalization,[3] knowledge of preeclampsia, experiences with gestational hypertension and preeclampsia, recommendations for optimal management[4,5] and the use of aspirin for the prevention of preeclampsia with a focus on good healthcare professional and patient communication.[6] Despite providing insight into these specific aspects, none of these studies were undertaken during pregnancy. There is also a paucity of studies of attitudes and behaviours regarding the use of antihypertensive medication in this population. Fear of adverse effects on the baby has been reported as a factor for medication hesitance in several studies.[7,8] Patient, socioeconomic, therapy and condition characteristics[9] all contribute to nonadherence to antihypertensives in the general adult population.[10]

Although some similarities may be drawn between the general adult population with hypertension and pregnant women, the nature of risk of uncontrolled hypertension during pregnancy is potentially a lot more imminent as it can be detrimental to the lives of both the mother and the fetus. Antihypertensive treatment is only prescribed during the pregnancy in the case of gestational hypertension/preeclampsia and is often initiated or modified during pregnancy for women with chronic hypertension.[11] It is for this reason that the experiences, behaviours and attitudes of pregnant women with HDP need separate investigation.

Our aim in this article is to investigate pregnant women's attitudes and behaviours towards HDP and their treatment. We focused on the attitudes and behaviours of pregnant women who were diagnosed with HDP and being treated with antihypertensive medication, for whom optimal adherence to medication is considered important in effective management.

Method

Study design

Qualitative in-depth interviews were conducted face-to-face with 27 pregnant women in either the second or third trimester of pregnancy, recruited from the antenatal outpatient clinics of two large tertiary maternity hospitals in Melbourne, Australia, over a 10-month period (January–October 2013).

Ethical approval

Ethical approval was obtained from Mercy Health Human Research Ethics Committee Heidelberg-Melbourne (R12/62) 08/01/2013, The Royal Women's Hospital Research and Human Research Ethics Committee Parkville-Melbourne (R13/18) 12/07/2013 and Monash University Human Research Ethics Committee Clayton-Melbourne (CF13/117) 18/01/2013.

Study sample

Participants were sourced via a larger mixed-methods study, which included 100 pregnant women with HDP. Eligible participants were identified by one researcher (A.H.) who reviewed the medical records of pregnant women attending antenatal clinics. A.H. then approached potential participants individually. Participants in the larger study responded to a questionnaire, where, on completion, they were asked to indicate their interest in undertaking an interview. Of the 98 women who responded to the questionnaire, 65 expressed interest in being interviewed. Combined convenience and purposive sampling was conducted among these 65 women to seek a breadth of views. Informed written consent was obtained prior to interview, which included permission to audio record and for quotations to be anonymously used in the reporting and publication of results. No participants dropped out of the study nor refused participation.

Participants all had a diagnosis of HDP and were prescribed antihypertensive medication. Interviews occurred during pregnancy except for one, which happened 1 day post-partum. All participants were aged 18 years or over and were fluent in English.

Data collection

Interviews were conducted by a single researcher A.H. a female Pharmacist who was a PhD candidate and had received training in in-depth interviewing prior to the commencement of the study as part of the PhD programme. The interviews were conducted using an interview guide that was based on literature[8,12] and agreed upon by the all of the authors (Box 1). As the interviewer had met the participants during the larger study, some rapport had been established prior to the interview. Participants were aware that the interviews were about their experiences with HDP. Interviews were conducted in a private room near the hospital outpatient department. Interview duration averaged 35 minutes (range 16–54 minutes).

Family members were present for some interviews but none of them participated in the interview or made comments. Socio-demographic and self-reported medical information was collected from participants through the questionnaire. Medical information was verified, with written consent, through medical records. Field notes were taken by the interviewer during the interviews. All interviews were audio-recorded, transcribed verbatim and de-identified. Interviews continued until data saturation was reached, that is, no more new information was discernible. The transcripts were not returned to the participants for comments or correction. No repeat interviews were conducted.

Box 1. Interview topic guide.

Topic one: Their hypertension
Explore the women's health beliefs surrounding their diagnosis of hypertension, e.g. when it was diagnosed and how they felt about it. Exploration into their beliefs regarding causation may also occur.
Topic two: Antihypertensive medication use during pregnancy
Explore concerns and experiences associated with the safety of using specific antihypertensive medications during pregnancy and thoughts on the importance of continuing them through pregnancy.
Investigate whether there was decreased or increased use of any particular medication and why, and factors contributing to compliance. Ask participants to compare the use of blood pressure medications to other medications during pregnancy.
Topic three: Medication beliefs
Explore the women's general medication beliefs related to the use of other medications during the current pregnancy, including over-the-counter medications, vitamins and alternative therapies, their perceived safety and benefits.

Data analysis

Data analysis occurred concurrently with the interviews. Initial coding was completed by A.H. using qualitative data management software QSR NVivo 10.[13] Inductive codes were generated systematically for the entire data set. Line-by-line analysis was then performed and nodes were created within NVivo. To ensure reliability, a random selection of 20% of the transcripts were coded independently by another member of the research team (K.S.). K.S. and K.R. read all the transcripts and differences were discussed among all three to reach consensus. The researchers were all pharmacists; K.S. and K.R. had extensive experience in conducting qualitative research. Transcripts were reread by A.H. and K.S. to ensure that coding was accurate and all relevant data were included.

Thematic analysis was employed.[14] This was done across all HDP subtypes and severities to obtain a wide breadth of views. When a pattern was seen within a certain subtype the coding was grouped specifically for that subgroup. Codes were arranged into potential themes. Themes were reviewed, refined and prepared into a final set; sub-themes were also identified within this process. In reporting, quotes are provided to illustrate the themes and the varied views of the participants. These quotes are presented in italics. The participants did not provide feedback on the findings.

Results

Participants

Twenty-seven women were interviewed to reach data saturation. Their demographics, clinical and obstetric characteristics are shown in Table 1.

Eight participants were primigravidae, the remainder were multigravidae, including six who had previous miscarriages. One participant had an assisted pregnancy (*in vitro* fertilization). Twelve were also prescribed aspirin for the prevention of preeclampsia. Participants ranged in age from 26 to 42 years.

Eighteen participants had chronic hypertension which was diagnosed before pregnancy; four of whom had secondary hypertension due to kidney disease or congenital heart disease. Nine women with chronic hypertension had their current antihypertensive regimen started during the pregnancy. Three participants had their hypertension diagnosed before 20 weeks gestation and were also classified as having chronic hypertension. Six women with chronic hypertension had developed preeclampsia superimposed on chronic hypertension at the time of the interview including one with severe preeclampsia and one with preeclampsia superimposed on secondary hypertension. Six women had gestational hypertension. All but one had developed preeclampsia at the time of interview; two of whom had developed severe preeclampsia. In total, twenty women had mild-moderate hypertensive disease whist seven had severe hypertensive disease at the time of the interview.

Interview themes

Four major themes emerged around beliefs and behaviours of pregnant women regarding treatment of their hypertension:

- Understanding of HDP and their implications;
- Risks versus benefits of antihypertensive medication during pregnancy;
- Trust in medical professionals; and
- Adherence to medication.

Understanding of HDP and their implications. Understanding of HDP as a condition varied among participants from different HDP subtypes as well as different gravidities. Some women knew a lot, others did not know but tried to find out, while others neither knew nor wanted to know.

Understanding of HDP as a condition often came from prior experience or family members' history:

> She [Obstetrician] said to me 'Go ahead with another pregnancy, because I wouldn't be that worried because your blood pressure went up at the end of the [previous] pregnancy'. . . I'm just keeping an eye on [the blood pressure potentially increasing in the third trimester]. . . because I know that that could happen. (#11, 33 years, 2nd pregnancy, second trimester, chronic hypertension)

> My Mum had high blood pressure when she had me and my brother, so I suppose it must run in the family. Wasn't really a shock. (#99, 34 years, 1st pregnancy, third trimester, late onset preeclampsia)

Table 1. Participant characteristics ($N = 27$).

Characteristics	*N*
Country of birth	
Australia	18
Other (India, Philippines, Nigeria, Malaysia, Indonesia, United Kingdom)	9
Ethnicity	
European	19
Asian	4
Middle-eastern	2
South-Asian	1
African	1
Co-morbid conditions	
None	16
Kidney disease	4
Depression	3
Type 2 diabetes	1
Congenital heart disease	1
Carpal tunnel syndrome	1
Rheumatoid arthritis	1
Gestational stage at interview	
Second trimester	6
Third trimester (32–34 weeks)	5
Third trimester (35–37 weeks)	6
Third trimester (⩾37 weeks)	9
1 day postpartum	1
Gestational trimester of hypertension diagnosis	
Pre-pregnancy	18
➢ Current antihypertensive regimen started during pregnancy	9
During pregnancy <20 weeks	3
At 20 weeks	0
During pregnancy >20 week	6
Subtype of hypertension[a]	
Gestational hypertension	3
Preeclampsia	3
Severe preeclampsia	2
Chronic hypertension	10
Secondary hypertension	3
Preeclampsia superimposed on chronic hypertension	4
Severe preeclampsia superimposed on chronic hypertension	1
Preeclampsia superimposed on secondary hypertension	1
Severity of hypertensive disease[a]	
Mild-moderate	20
Severe	7
Antihypertensive medication*	
Methyldopa	11
Labetalol	15
Atenolol	1
Nifedipine	1
Oxprenolol	1
Phenoxybenzamine	1

[a]Classification according to the Society of Obstetric Medicine of Australia and New Zealand (SOMANZ) guidelines 2014(1).
*Eight participants were prescribed more than one antihypertensive medication.

Sound knowledge about HDP led to more informed decisions and preparedness whereas lack of knowledge led to apprehension and lack of comprehension of the seriousness of the condition. Several women with chronic hypertension were not informed of the potential implications of their hypertension during pregnancy. Some even avoided asking questions to remain oblivious to the potential implications of HDP:

> I just want to be aware, so that if I do develop full preeclampsia I know what I am in for. . . because I read how. . . when you have the baby, it can turn into eclampsia. . . I want to be able to make an informed decision. (#32, 42 years, 3rd pregnancy, third trimester, severe early onset preeclampsia)

> I didn't even hear about it [preeclampsia] to tell you the truth, I couldn't even pronounce the word when they told me [at 21 weeks gestation], what is it, I didn't know. (#71, 37 years, 2nd pregnancy, third trimester, severe early onset preeclampsia superimposed on chronic hypertension)

> No, I didn't [ask questions], no, I'm not into reading books and anything like that. . . just read little bits and pieces and just leave it up to the doctor, he can just tell me. Sometimes it's sort of like best not to know. (#22, 37 years, 3rd pregnancy, third trimester, chronic hypertension)

The perceived implications of HDP included development of preeclampsia, premature birth and intra-uterine growth restriction. The understanding of preeclampsia varied among the women. Those who understood the implications of preeclampsia were more prepared for what may happen than those who did not:

> You've just got to be prepared, I guess. I prefer to know about it [preeclampsia] than to not know about it and if there is something I could do to maybe prevent it, then best to have it [medicine]. (#2, 30 years, 1st pregnancy, third trimester, secondary chronic hypertension)

> It's an unknown so that's why it does worry me. . . I know of people who have had preeclampsia and they have had to have their babies really early, which is less stressful for me. . . going back to 30 weeks kind of was a worry that if that did happen to me, something could go wrong and then I would have to bring the baby on early and. . . all the complications that come with that. (#19, 26 years, 1st pregnancy, third trimester, chronic hypertension)

Many women did not have a sound understanding of the risk of premature birth. Some were surprised to be told that they would potentially need to be delivered earlier than full term, while others had to find their own information:

> I guess I was like a little bit sort of surprised at the time [when the obstetrician mentioned it] to think, oh gee, I really might not go full term. (#21, 35 years, 1st pregnancy, second trimester, chronic hypertension)

> After I did my research I stumbled across the preeclampsia. . . I was reading that if you do develop preeclampsia that the baby may need to be induced quite early. . . because it is a risk for the baby if you do develop that. It's a risk to the mother as well, because you can actually go into a coma. (#24, 35 years, 1st pregnancy, third trimester, chronic hypertension diagnosed during pregnancy before 20 weeks gestation)

The potential for intra-uterine growth restriction was mostly understood. Some exhibited fear while others considered it as a matter of fact:

> What I am afraid of, if I develop preeclampsia, is that the blood flow through the placenta doesn't get affected so that the baby doesn't get affected. (# 21, 35 years, 1st pregnancy, second trimester, chronic hypertension)

> I had a scan on Thursday and the baby is. . . not growing at the same rate it should, so it's gone from 50, 35 to 20th percentile. . . it's because [of the] blood pressure. . . the blood doesn't pass through your placenta properly. (#74, 36 years, 2nd pregnancy, third trimester, chronic hypertension)

Some women felt overwhelmed by the volume of information that they received from the treating team and often needed more time to process it before being able to ask any questions. Others felt confused and resorted to using the Internet as a source of information:

> So. . . it took me a while to get my head around being in hospital. There I was. . . on the labetalol straight away and then all blood tests and neuro tests and steroids and it was all just bang, bang, bang, happening quite fast. . . then it was after, when I went home and I was able to rest. . . that I could think about more questions that I wanted to ask. (#32, 42 years, 3rd pregnancy, third trimester, severe early onset preeclampsia)

> I often get very confused when I'm in seeing the doctors and I get a bit overwhelmed and I don't ask a lot of questions, and then I kind of come away thinking 'I wish I'd asked that question and really pushed the answer'. And then usually I take to Googling it, which is always the worst. (#41, 34 years, 1st pregnancy, third trimester, late onset preeclampsia superimposed on secondary chronic hypertension)

Conflicting information from various medical professionals often led to confusion:

> I saw someone different every time I went. . . and it was all real higgledy, piggledy information. I never got the same information from the same person, which was really, really hard. (#74, 36 years, 2nd pregnancy, third trimester, chronic hypertension)

> They said it [aspirin] helps with blood pressure, and they said that I had to start taking them. . . but the thing is that one doctor told me to take it this many weeks and then another one told me to take it this many weeks, and supposedly I started taking it too late. So, I don't know. . . I kind of rounded it off in the middle and it was wrong. (#90, 35 years, 7th pregnancy, third trimester, chronic hypertension)

Risks versus benefits of antihypertensive medication during pregnancy. After being prescribed antihypertensive treatment during pregnancy, many women assessed the risk versus benefit balance in the context of the baby being their priority. For some, taking the medication was perceived as preserving the pregnancy and allowing longer gestation time. The short-term nature of antihypertensive use in gestational hypertension also positively affected their decision to take the medication:

> I mean, emotionally you feel pretty bad taking medication. . . I've often felt really bad for her [the baby]. Like I've always said, I've been a terrible vessel for her. . . I wish I was better. . . I wish my body was stronger to be able to do it for her, but. . . at the same time, the medication has gotten me through so that I can have her so, you know, it's a weigh up. (#41, 34 years, 1st pregnancy, third trimester, late onset preeclampsia superimposed on secondary chronic hypertension)

> I have only ever thought 'Oh it's only for a short time'. I can do it because it's only for such a short time. . . I can do it. It's just like 10, 12 weeks or so. I can do this'. (#6, 28 years, 4th pregnancy, 1 day postpartum, gestational hypertension)

Others had concerns about the effect of antihypertensive medications on the baby and feared a potentially negative impact. Some were prescribed a medication that was not safe during early pregnancy but wanted to avoid uneasiness and were content with oblivion:

> I asked the midwife and even the doctor. . . 'will it [the antihypertensive] affect my baby, because I am very concerned taking so many hypertensive drugs, and I am just afraid that something might happen to my baby'. And then they said 'No, no nothing will happen to your baby. because those drugs have been given [safely]. . . for pregnant women'. (#14, 40 years, 2nd pregnancy, second trimester, severe early onset preeclampsia)

> I wonder actually [about the potential effect of atenolol during the first trimester]. . . but I don't want to stress myself also because I'm scared that if I ask this kind of question and then they start telling me about 'Oh the baby might have this might have that'. . . in the end I will get stressed and. . . I won't be able to continue my pregnancy. . . in a relaxed condition. So sometimes I find that oblivious can be quite a good [thing]. (#59, 34 years, 1st pregnancy, second trimester, chronic hypertension)

The Internet was a source of information for many of the women regarding the risk versus benefit balance of antihypertensives during pregnancy. Women were mostly vigilant in finding the most appropriate Internet source while others were less cautious. The consumer medicines information leaflets (CMI) for the antihypertensives were another source of information. Concerns were voiced about the CMI for

labetalol,[15] as it contained information conflicting with other sources of information. One participant expressed her concern of the baby coming out 'green and glowing':

> Just have a look which ones are good ones [internet sites], you know reputable. . . whether it's by. . . a government agency, whether it's got actual medical. . . people speaking on there, where their references come from. If you cross check it against other sites and they say similar things. If there's someone, or an agency or a body that you've heard of that you think would be. . . one that you could trust. (#99, 34 years, 1st pregnancy, third trimester, late onset preeclampsia)

> [The labetalol CMI] was really concerning because it says let your doctor know if you're pregnant. . . there's not that much information out there on Google about it [so next time I saw the doctors I asked] is there any side effects with the labetalol and they said no, none whatsoever, so I had to just trust in that. (#32, 42 years, 3rd pregnancy, third trimester, severe early onset preeclampsia)

Prior experience with HDP also influenced opinion of the risk versus benefit balance. Fears of a sudden increase in blood pressure, even when it was low, gestational timing of taking the medication and previous uncontrolled blood pressure and preeclampsia brought back undesirable memories:

> My only worry is that, with my first pregnancy, I started the tablets when the baby was all developed and ready to come out, and this time I'm taking the tablets from the beginning of the pregnancy. (#11, 33 years, 2nd pregnancy, second trimester, chronic hypertension)

> Ooh, I don't want medicine but I was like 'Ooh medicine/neonatal intensive care unit?; medicine/neonatal intensive care unit? – I decide medicine'. . . It wasn't really a big hard decision. I mean, I'd been in the neonatal intensive care unit with [third child] and [visited] our friend's little girl. . . I didn't want to go back there. (#6, 28 years, 4th pregnancy, 1 day postpartum, gestational hypertension)

Trust in medical professionals. Many women expressed trust in their treating doctors. The doctor's medical knowledge and professional experience were given as reasons to trust them and not question further. Some participants briefly questioned the need for medications but trust in the doctor led them to take the medication:

> I didn't do any research only because I trust, I had trust in the doctors. . . it's confidence. . . that they know obviously what they're doing. They've had their medical certificates for many, many years. (#8, 36 years, 2nd pregnancy, third trimester, chronic hypertension)

> You would trust that doctors aren't going to put you on anything that is going to harm the baby and that you are seeing the specialists who know what you can and can't have. (#5, 38 years, 5th pregnancy, third trimester, gestational hypertension)

Women differentiated between doctors on their perception of the professional's level of experience when it came to the prescribing of the antihypertensive. Differing medical opinions sometimes caused lack of confidence in a doctor's advice and at times, lack of trust. This was sometimes linked to the woman's unfamiliarity with a doctor, when multiple doctors are involved in the patient's care. An impression that the doctor was not confident also resulted in lack of trust:

> He [physician] said 'At this stage your reading is okay. . . however, you know you may need to go on blood pressure tablets later on during the pregnancy'. [then] I was having a baby monitoring test. . . and a doctor that I didn't know. . . came in and, because of the blood pressure readings, decided that I should go on the medication. . . I hesitated at first. . . because of the fact that the physician who specializes in blood pressure ruled it out at that stage. I felt a little bit uncomfortable with a doctor I didn't know saying I should go on them. (# 24, 35 years, 1st pregnancy, third trimester, chronic hypertension diagnosed during pregnancy)

> I went down to the Emergency section and then they had my file but they kept asking me 'Oh, ok so you don't have any blood pressure problems?' and I am like 'No you've got my file in front of you and it says I have got blood pressure problems and I am on pills'. . . I don't know. . . I just wasn't confident in what she said and I wasn't sure really that doubling it [the antihypertensive dose] was [a good idea]. . . she just kept asking me the same thing. . . I just wanted to talk to someone who was going to say 'Doubling is what you should do'. (#2, 30 years, 1st pregnancy, third trimester, secondary chronic hypertension)

Community pharmacists were a valuable source of information for some women. Others, however, had found that pharmacists were not confident with their knowledge regarding medication use during pregnancy:

> I was told not to [look at the Internet] and I always ask the chemist or I ask my doctor what else I could take and I couldn't take anything. (# 1, 39 years, 2nd pregnancy, third trimester, secondary chronic hypertension)

> I find out if you're asking something, the pharmacist – you do ask them. . . and they're good, but some of them they keep searching on the internet forever. It's better if you search on the internet [yourself]. (#81, 34 years, 1st pregnancy, second trimester, chronic hypertension)

Adherence to medication. Women with chronic hypertension who were complacent about taking antihypertensives before pregnancy started to improve adherence to their medication for the safety of the baby. Some women with gestational hypertension believed that they had no choice but to take the prescribed treatment. Worsening of blood pressure was also an incentive to take the antihypertensive medication. Safety concerns, however, resulted in intentional nonadherence to aspirin by some women:

> I took it straight away because it was for blood pressure. . . if something happens inside or he gets taken out early, either way I don't really have much of a choice. . . but it wasn't the doctors saying I don't have a choice, it was my head telling me I don't have a choice. (#6, 28 years, 4th pregnancy, 1 day postpartum, gestational hypertension)

> I really worried about taking the aspirin, and they had prescribed it to me before my 12 weeks and had told me to start taking it. . . I refused to take it; I just didn't tell them. I just stopped – wouldn't take it until I was 12 weeks. I was really worried about taking it before the 12 weeks. (#41, 34 years, 1st pregnancy, third trimester, late onset preeclampsia superimposed on secondary chronic hypertension)

Adverse effects from the antihypertensives resulted in intentional nonadherence by some women. Others were hesitant to stop taking the antihypertensive despite adverse effects:

> I took it [methyldopa]. . . it made me sick, so I stopped taking it. (#90, 35 years, 7th pregnancy, third trimester, chronic hypertension)

> They weaned me off that [oxprenolol] very early. I am thinking by about 20 weeks I was off it. . . I didn't need to take it basically. . . My heart rate was very low and they didn't want my heart rate to be that low. . . No. I never thought of just stopping it. I asked the specialist and she said I couldn't just stop it like that. (#1, 39 years, 2nd pregnancy, third trimester, secondary chronic hypertension)

Some women perceived taking the antihypertensive as an interference to their lifestyle. There were those who could not see how to incorporate the antihypertensive regimen into their daily routine and others who were resistant to change:

> Because now, after I got pregnant, the doctor changed the medicine to oxprenolol, and oxprenolol is twice a day. Atenolol is once a day. . . I always remember before I sleep I would take one. . . But normally in the morning, I'm busy – tidy house, breakfast, watch TV. That's already one o'clock, then I already miss a time, so I skip them again. I would just take the night [dose]. (#59, 34 years, 1st pregnancy, second trimester, chronic hypertension)

> I didn't know what kind of medication and what kind of changes I would have to make. . . I didn't want to change my lifestyle. I love my lifestyle, I love food. . . it was more that I didn't want to change that. (#18, 35 years, 2nd pregnancy, second trimester, chronic hypertension)

Significant others were a source of encouragement in several cases, whereas some significant others would challenge the woman to re-evaluate her need for the medication:

> It's alright, get up in the morning – because I've got two kids I'm home anyway – so I'm usually up in the morning. So whatever time I get up, on average about 8 o'clock is usually when I take it, and then lunchtime about 3 or 4, before I go to bed about 11. So, we space it out so it's like an eight-hour gap in between each one. . . and if I forget my husband reminds me. (#64, 30 years, 3rd pregnancy, third trimester, chronic hypertension)

> Well I think my partner put it perfectly. . . he said 'I don't know if I like you taking the medication because it's sort of tricking your body into doing something'. . . just after taking it, within those first couple of hours I have got a lot of energy. And he said 'You know, is it really that good that you are taking it?' Isn't it better that they see the true picture, you know, because often I will come in here, only a couple of hours after taking the tablet, and the blood pressure is down. (#5, 38 years, 5th pregnancy, third trimester, gestational hypertension)

Unintentional nonadherence in the form of forgetting to take the medication was seen in many women. Some would ask for advice when they forgot a dose. Others used adherence aids like pill boxes to help them:

> I have breakfast, and try taking them at night before I go to bed, and lunch time. . . but I forget sometimes. . . you get busy through the day. . . and I forget, especially when I'm at work. . . and even this morning, I normally take them with breakfast, but then I took my daughter to the childcare and I'm like 'Oh I haven't taken any of my med.'. . . Oh well, I took them when I got home. But it's just. . . life isn't it? (#74, 36 years, 2nd pregnancy, third trimester, chronic hypertension)

> I think the chemist doctor person would have, like, enough knowledge to give me an educated description of what to do [after I forgot to take the dose]. (#6, 28 years, 4th pregnancy, 1 day postpartum, gestational hypertension)

> Pillbox. Otherwise I don't remember. I do them at the same time every day, as soon as I wake up in the morning take the blood pressure and then take the pill, at dinner take the pill, take the blood pressure take the pill, so try and remember. (#2, 30 years, 1st pregnancy, third trimester, secondary chronic hypertension)

Discussion

This study is the first to explore pregnant women's attitudes and behaviours towards their HDP and its treatment during pregnancy using in-depth interviews and to be analysed from a pharmacist perspective.

Previous HDP, family history and obtaining information from a healthcare professional or the Internet facilitated understanding of the implications of HDP. This is similar to a study which found that higher literacy, multiparity, history of preeclampsia and receipt of information about preeclampsia from a clinician or another information source (e.g. the Internet, television, books or friends) were factors associated with a greater proportion of correct answers on a survey of 25 questions assessing knowledge of preeclampsia; however, patients only answered an average of 43% correctly.[4]

Those with sound knowledge were more prepared for the possibility of the progression of the HDP and emergence of implications, namely preeclampsia, premature birth and intra-uterine growth restriction. This allowed them to make more confident decisions when it came to treatment of HDP and to plan for the care of children they already had. In our study, those who were not aware of the implications of HDP on the baby had not been offered information about the risks, nor did they ask or search for any information. This was mainly seen in those with pre-existing chronic hypertension. Women only became aware of the risks when their blood pressure was already high or when they were showing signs of preeclampsia. In contrast, those who had secondary chronic hypertension were well-informed and prepared for the potential complications of HDP. This may imply that the latter group were informed of the risks prior to pregnancy by their treating doctors, whereas those with primary chronic hypertension were not.

The volume of available information at the time of diagnosis of gestational hypertension/preeclampsia was deemed overwhelming at times. This information was often given verbally by the treating team thus not allowing the patient to review the advice at a later date nor reference the information when being faced with conflicting advice from different healthcare professionals. Many women did not know that low-dose aspirin was prescribed to prevent preeclampsia and assumed that it was for blood pressure. This led to some intentional nonadherence due to safety fears during the first trimester. Since the time of patient recruitment to this study, one of the research sites has produced a fact sheet explaining preeclampsia and the use of low-dose aspirin in prevention.[16] Although it is not yet known how this has impacted patient understanding, it would be expected to yield some reassurance for women at risk of developing preeclampsia, thus allowing them to make more informed decisions about their treatment.

The balance of risk versus benefit regarding antihypertensive medication during pregnancy was related to the patient's understanding of the information that she had access to, as well as her previous experiences. As previously mentioned, some women felt overwhelmed by the volume of information or were confused by differing advice from various doctors. This limited the woman's ability to make a sound risk versus benefit decision but trust in the treating doctor encouraged most women to take the antihypertensive. Previous experiences with HDP facilitated the balance of risk versus benefit often resulting in the decision to take the medication as prescribed. The severity of the hypertension/preeclampsia as well as the stage of pregnancy at the time of the interview also impacted on the women's decision. Those who understood the risk of early premature birth also had a better grasp of this balance. A recent study of health beliefs about medicines in pregnancy found that nearly half of the women were worried about the effects of a medication when they used it for a long period.[17] In our study, women with gestational hypertension who had a shortened length of antihypertensive treatment perceived this as an incentive to take the medication as prescribed. Women with gestational hypertension who were prescribed the antihypertensive after 20 weeks gestation also did not have the burden of first trimester medication safety concerns.[7]

The consumer medicine information leaflet for labetalol caused understandable angst among some women because of the statement 'Do not take this medicine if you are pregnant'.[15] This deterred some women from taking it until they were able to clarify with their treating doctor, whereas others were confused by conflicting advice and decided not to take the medication. Both clinical and community pharmacists have a role to play in the clarification of this perplexity. Community pharmacists, in particular, are readily accessible for advice. Similarly, the treating doctor is in a position to explain the reason for the warning in the CMI but reassure the patient about the safety of labetalol. A strong healthcare professional/patient partnership can facilitate patient understanding and allow clarification of concerns to provide assurance around the safety and role of antihypertensive medications in the treatment of HDP.[6]

Trust in the treating doctor was expressed by many of the women and it convinced most women to take their antihypertensive. This was observed at a higher rate than may have been expected given the age of the participants and the influence of the Internet on the decision-making process. It should be remembered that many participants were experiencing a high-risk pregnancy, with the possibility of sudden negative changes to their state of health and that of their baby at any time during the pregnancy.[1] Some, especially those with gestational hypertension or preeclampsia, also had to cope with a new diagnosis of an urgent serious condition, often with little or no immediate symptoms.[1,3] This has previously been reported in patients who were informed of a cancer diagnosis. Patients diagnosed with pancreatic cancer reported that they perceived themselves as having no choice in treatment of the condition in light of the new, urgent and life-threatening situation, but that trust in the treating doctor was paramount.[18] The self-reported trusting nature of some of our participants supported their decision to take the antihypertensive medication as prescribed, without feeling the need to search for other sources of information for reassurance.

Lack of confidence in the doctor's advice was observed when there were conflicting medical opinions. This resulted in confusion for the patient with some taking the advice of the treating doctor and others waiting to see the initial treating doctor before making the decision to take the medication. Similarly, some of the women were later treated by unfamiliar doctors, resulting in a lack of trust. Seniority in terms of their experience engendered trust in the treating doctor; thus, when a doctor showed lack of confidence in the treatment of the patient, this was followed by lack of trust. In an Australian qualitative study by midwives on the experiences of women who had gestational hypertension or preeclampsia during pregnancy the authors argued that a

multidisciplinary, collaborative, continuity of care model should be provided to women in a high-risk pregnancy such as gestational hypertension and preeclampsia.[5] Furthermore, improved continuity of care has been found to result in higher medication adherence in the general adult population in conditions such as type 2 diabetes.[19]

Community pharmacists were a valuable source of information for some women. Others, however, found that pharmacists were not confident with their knowledge regarding hypertension in pregnancy. This can result in conflicting advice as observed in a study of adherence to aspirin in the prevention of preeclampsia.[6]

The decision of each woman to adhere to antihypertensive medication was influenced by her individual understanding of HDP and its implications, her risk versus benefit analysis and her trust or lack thereof in her treating doctor. These themes are largely consistent with those identified in the World Health Organization (WHO) publication 'Adherence to Long-term therapies: Evidence for Action', namely: patient (20%), socioeconomic status (20%), condition (20%), therapy (20%) and healthcare team/healthcare system (20%).[9] The women who had a sound understanding of the risks were aware that adherence to the antihypertensive would be of benefit to both themselves and their unborn babies. There were, however, others who did not want to take their antihypertensive medication as they were not aware that consistently high blood pressure could be harmful for the baby. Improved understanding of the risks of uncontrolled blood pressure during pregnancy and good communication between the patient and the healthcare team can promote adherence in this group of women. Partner support during pregnancy has been well documented as having a pivotal role in social and psychological support.[20] A partner with limited knowledge about potential risks of HDP may not recognize warning signs of the condition and may not pursue care for his pregnant partner in a timely manner.[21] In this regard, it may be valuable to involve the partner in the discussion of the potential risks of HDP. Similarly, involving the partner in the discussion around treatment of HDP can potentially assist the woman if she is overwhelmed with information and also to clarify any questions/misconceptions that the partner may have surrounding the HDP. This may enable the patient to have a clearer understanding of the risks of HDP and risks versus benefits in taking the medication, thus facilitating better adherence. Significant others were also seen as facilitators for adherence when reminding women to take the antihypertensive when they might have forgotten a dose.

Adverse effects, which were the cause of medication discontinuation in some women, could be discussed with the treating team in an open way. Good communication between the patient and the healthcare team increases trust,[6] facilitating the conversation with the doctor to potentially alter the medication to a more suitable agent, thus helping adherence. Community pharmacists can also assist with supplying adherence aids to those who are on multiple medications and have unintentional nonadherence.

In closing, we recommend that women of child bearing age with chronic hypertension be informed by their general practitioner of the risks of chronic hypertension during pregnancy, including an increased risk of preeclampsia. They should also be advised that their antihypertensive be changed to a safer one when planning pregnancy or as early as possible in the pregnancy. Community pharmacists can assist in initiating the conversation of switching to a safer antihypertensive if pregnancy is being planned. Pharmacists may also help to reassure women of the safety of labetalol during pregnancy by going through the consumer medicine information with them during counselling. Pharmacists are in a unique position, as accessible first line health professionals, to be a trusted source of information for women with HDP but might have limited experience in the field and require further training. Training should also be provided to emergency department doctors in maternity hospitals regarding the relevant treatment protocols followed by physicians and obstetricians for managing HDP. This could assist in providing a unified approach to treatment for such women, thus facilitating trust and adherence.

Our study included women with all forms of HDP except HELLP and eclampsia, as the interviews were done when the women were in a comfortable, non-emergency situation. Recruitment was from two major public maternity referral hospitals in Melbourne with a widespread combined catchment including metropolitan, regional and rural areas. Participants varied in gestation stage, subtype of HDP, severity of HDP, ethnicity and socioeconomic status allowing for a wide range of views. The interviews and analyses were conducted by researchers from a pharmacy background and all had extensive experience working in interdisciplinary teams. The interviews were conducted during pregnancy thus reducing recall bias. This is in contrast to other qualitative studies which explored aspects of HDP in retrospect.[3,5,6]

Limitations of the study. Participants did not include those in the first trimester of pregnancy, as most were scheduled to attend the antenatal clinics after 12 weeks gestation. Views of women with chronic hypertension during the first trimester of pregnancy may vary from those in the second and third trimesters. Women with poor English skills were excluded from the study, therefore, caution should be taken in the extrapolation of our findings to women from non-English speaking backgrounds. Having both sites in only one city was, however, a limitation to extrapolating the results beyond Melbourne.

Conclusion

Pregnant women with HDP have varied understanding of the condition and the need for treatment. Good communication with healthcare professionals may help build trust contributing to conversations that result in better understanding. Attention needs to be paid to the concerns of the patient, both in terms of the condition and its risks as well as concerns around treatment. Obstetricians, midwives, general practitioners and community

pharmacists can help bridge the knowledge gap and offer counselling to resolve concerns hindering adherence to HDP treatment.

Acknowledgements

We would like to thank the staff at both the Mercy Hospital for Women and the Royal Women's Hospital for their help with this study. We would also like to thank all the women who participated in this study.

Author contributions

All authors contributed to the conception and design of the study. Patient recruitment and in-depth interviews were undertaken by A.H.. Data analyses and interpretation were performed by A.H., K.S. and K.R.. The manuscript was written by A.H. and critically reviewed by all authors. All authors read and approved the final manuscript.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical approval

Ethical approval for this study was obtained from Mercy Health Human Research Ethics Committee Heidelberg-Melbourne (R12/62), The Royal Women's Hospital Research and Human Research Ethics Committee Parkville-Melbourne (R13/18) and Monash University Human Research Ethics Committee Clayton-Melbourne (CF13/117).

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Informed consent

Written informed consent was obtained from all subjects before the study.

ORCID iDs

Amyna Helou https://orcid.org/0000-0002-4162-0711

Johnson George https://orcid.org/0000-0002-0326-0495

References

1. Lowe SA, Bowyer L, Lust K, et al. SOMANZ guidelines for the management of hypertensive disorders of pregnancy 2014. *Aust NZ J Obstet Gyn* 2015; 55(5): e1–e29.
2. World Health Organisation. *The World Health Report 2005: Make every mother and child count*. 2005, https://www.who.int/whr/2005/en/ (accessed 6 November 2020).
3. Barlow JH, Hainsworth J and Thornton S. Women's experiences of hospitalisation with hypertension during pregnancy: feeling a fraud. *J Reprod Infant Psyc* 2008; 26(3): 157–167.
4. You WB, Wolf M, Bailey SC, et al. Factors associated with patient understanding of preeclampsia. *Hypertens Pregnancy* 2012; 31(3): 341–349.
5. Roberts LM, Davis GK and Homer CS. Pregnancy with gestational hypertension or preeclampsia: a qualitative exploration of women's experiences. *Midwifery* 2017; 46: 17–23.
6. Shanmugalingam R, Mengesha Z, Notaras S, et al. Factors that influence adherence to aspirin therapy in the prevention of preeclampsia amongst high-risk pregnant women: a mixed method analysis. *PLoS ONE* 2020; 15(2): e0229622.
7. Nordeng H, Ystrom E and Einarson A. Perception of risk regarding the use of medications and other exposures during pregnancy. *Eur J Clin Pharmacol* 2010; 66(2): 207–214.
8. Lim AS, Stewart K, Abramson MJ, et al. Asthma during pregnancy: the experiences, concerns and views of pregnant women with asthma. *J Asthma* 2012; 49(5): 474–479.
9. Sabate E (ed.) *Adherence to long-term therapies: evidence for action*. Geneva: World Health Organization, https://www.who.int/chp/knowledge/publications/adherence_full_report.pdf (accessed 20 September 2020).
10. Burnier M and Egan BM. Adherence in hypertension a review of prevalence, risk factors, impact, and management. *Circ Res* 2019; 124(7): 1124–1140.
11. Helou A, Walker S, Stewart K, et al. Management of pregnancies complicated by hypertensive disorders of pregnancy: could we do better? *Australia New Zealand J Obstetric Gynaecol* 2017; 57(3): 253–259.
12. Sawicki E, Stewart K, Wong S, et al. Medication use for chronic health conditions by pregnant women attending an Australian maternity hospital. *Aust N Z J Obstet Gynaecol* 2011; 51(4): 333–338.
13. Microsoft Windows NVivo 10, http://help-nv10.qsrinternational.com/desktop/concepts/about_nodes.htm (accessed 21 February 2020).
14. Braun VCV. Using thematic analysis in psychology. *Qual Res Psychol* 2006; 3(2): 77–101.
15. NPS Medicine Wise. Presolol (Labetalol) Consumer Medicines Information leaflet (CMI), https://www.nps.org.au/medicine-finder/presolol-tablets (accessed 15 August 2020).
16. The Royal Womens Hospital. Explaining Preeclampsia 2018, https://thewomens.r.worldssl.net/images/uploads/fact-sheets/Preeclampsia-2018.pdf (accessed 14 July 2020).
17. Nugraheni G, Sulistyarini A and Zairina E. Beliefs about medicines in pregnancy: a survey using the beliefs about medicines questionnaire in Indonesia. *Int J Clin Pharm* 2020; 42(1): 57–64.
18. Schildmann J, Ritter P, Salloch S, et al. 'One also needs a bit of trust in the doctor . . .': a qualitative interview study with pancreatic cancer patients about their perceptions and views on information and treatment decision-making. *Ann Oncol* 2013; 24(9): 2444–2449.
19. Chen C, Tseng C and Cheng S. Continuity of care, medication adherence, and health care outcomes among patients with newly diagnosed Type 2 diabetes A longitudinal analysis. *Med Care* 2013; 51(3): 231–237.
20. Kotelchuck M and Lu M. Father's role in preconception health. *Matern Child Health J* 2017; 21(11): 2025–2039.
21. Mellon M, Schiller A, Nelson AL, et al. Awareness of pregnancy-associated health risks among pregnant women and male partners surveyed in a prenatal clinic. *J Womens Health* 2020; 29(3): 376–382.