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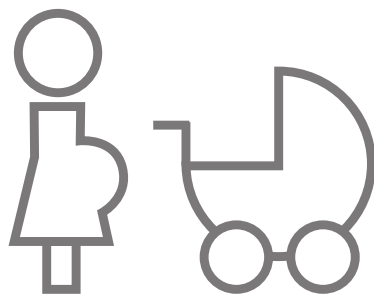
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# CHAPTER

# 7

Counseling and management of  
cardiovascular risk factors  
after preeclampsia

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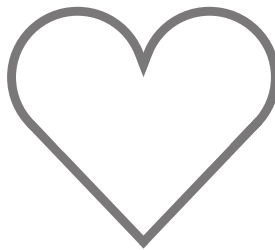
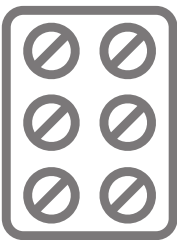
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## ABSTRACT

**Background:** Women with a history of preeclampsia have an increased risk of cardiovascular disease. Gynaecologists have an important role in the counseling and management of cardiovascular risk factors after preeclampsia. We aimed to assess the role of gynaecologists in informing women on interventions and risk factor follow-up after *early* and *late* preeclampsia.

**Methods:** In 2011 and 2014 all gynaecologists in the Netherlands were invited for a questionnaire.

**Results:** In 2011 the questionnaire was answered by 244 and in 2014 by 167 gynaecologists. After *early* preeclampsia, in 2011, 53% advised yearly blood pressure measurements; this increased to 65% in 2014. Over the years there was an increase in respondents advising an increased physical activity of 35% in 2011 to 56% in 2014. After *late* preeclampsia, in 2011, 36% advised yearly blood pressure measurements; this increased to 46% in 2014 and there was an increase in gynaecologists advising increased activity (32% in 2011 to 56% in 2014). In both *early* and *late* preeclampsia, smoking cessation and weigh loss were advised often (70-80%); glucose ad lipid screening were advised rarely (6-20%).

**Conclusion:** Although there is still a considerable scope for improvement, an increasing number of gynaecologists advise women after preeclampsia on preventive interventions to decrease risks of cardiovascular disease.

## INTRODUCTION

Hypertensive disorders are common complications of pregnancy and a major cause of maternal and neonatal mortality and morbidity [1]. Hypertensive pregnancy disorders include a spectrum of clinically challenging conditions, including preeclampsia. Preeclampsia is a pregnancy specific disease with clinical signs of hypertension and proteinuria. Not only during pregnancy women with preeclampsia suffer harmful effects; after delivery health risks remain. Compared to women with a history of uncomplicated pregnancy, women with history of preeclampsia exhibit more cardiovascular risk factors later in life [2-6]. Therefore pregnancy complicated by preeclampsia reveals important information about women's future health risks [7, 8]. Preeclampsia can be perceived as an opportunity to detect women with higher cardiovascular disease risk. Early recognition of cardiovascular risk factors allows for timely interventions to reduce these risks. Preventive interventions directly after pregnancy are potentially effective in decreasing morbidity and mortality [9]. Ideally, postnatal caregivers should inform women about the increased risk of cardiovascular disease and give guidance to additional tailored made preventive interventions, which might be effective in reducing cardiovascular risk in this relatively young population. Gynaecologists have an important role in this process since they are the gatekeeper for identification of these women. Adequate counseling and management of the risk factors by gynaecologists will help to establish durable care by general practitioners and could create a safety net for lifelong prevention and care.

In recent years the attention on preeclampsia as a risk factor for cardiovascular disease increased. Guidelines have been adapted to include new-gained insights [10-12]. A review of guidelines described that any advice on 'counseling about long-term health risks' was present in five national guidelines on hypertensive pregnancy disorders [13]. These guidelines paid attention on the association of hypertensive pregnancy disorders and future health risks and suggested lifestyle counseling. It is unknown if gynaecologists adapted their postpartum advices on these new-gained insights. Therefore the aim of this study was to assess the role of gynaecologists in the counseling and management of cardiovascular risk factors after *early* and *late* preeclampsia. In line with the increased attention in guidelines, we compared the advices of gynaecologists on this topic in 2011 and 2014.

## METHODS

### Study population

To analyse role of gynaecologists in the counseling and management of cardiovascular risk factors after preeclampsia, we composed a web-based questionnaire. We invited all 834 gynaecologists in the Netherlands as registered in 2011, according to the Dutch Society of Obstetrics and Gynaecology (NVOG). Residents were excluded. We created an online survey account and sent an e-mail with a link to the web-based questionnaire to the gynaecologists. The questionnaires were filled in anonymously. After one month we sent a reminder. In 2011, all gynaecologists were asked what advices they gave at the postpartum checkup to women who experienced *early* or

*late* preeclampsia in their pregnancy. Questions regarded interventions aimed at follow-up of risk factors and prevention of cardiovascular disease. These included the advices on blood pressure measurements postpartum, laboratory screening on coagulation, glucose and lipid profile and lifestyle changes as increasing physical activity, smoking cessation and weight loss (**addendum 1**). Three years later, in November 2014, an identical questionnaire was sent to the same e-mail addresses used in 2011.

### Definitions

Preeclampsia was defined as hypertension (blood pressure  $\geq 140/90$  mmHg) and proteinuria ( $\geq 0.3$ gr/24 hrs.), with an onset after 20 weeks of gestation. *Early* onset preeclampsia resulted in labor before 34 (complete) weeks of gestation. *Late* onset preeclampsia consequently resulted in labor after 34 weeks of gestation [14].

### Statistical analyses

Data were analysed using SPSS (version 21.0). We used the independent sample t-test and chi-square test for comparison of the unpaired data of 2011 and 2014. A p value  $< 0.05$  was defined statistically significant.

## RESULTS

In 2011, 244 of the registered gynaecologists in the Netherlands responded to our survey (29%). Three years later, in 2014, 167 gynaecologists from the similar group answered the questionnaire (20%). Baseline characteristics of the respondents are given in **table 1**.

In 2011 respondents took care for a mean of 4.6 ( $\pm 5.3$  SD) patients with early onset preeclampsia each month in their clinic, in 2014 this was 4.1 ( $\pm 5.1$  SD) patients were consulted each month ( $p=0.40$ ). As expected, respondents consulted considerably more patients with late onset preeclampsia; in 2011 12.4 ( $\pm 10.2$  SD) in 2014 10.9 ( $\pm 11.7$  SD) patients per month ( $p=0.23$ ).

### Early onset preeclampsia

The postpartum advices of gynaecologists to women with early onset preeclampsia are reported in **table 2**. There was a significant increase in respondents advising women with early onset preeclampsia to yearly check their blood pressure (respectively 53% in 2011 vs. 65% in 2014,  $p=0.023$ ). Laboratory testing for glucose or lipid profile was advised by approximately 15% of the respondents, with no significant increase over the time points (**table 2**). In 2011, increasing physical activity was only advised by 35% of the respondents while in 2014, 56% advised women to increase activity ( $p<0.001$ ). Smoking cessation, weight loss and testing for coagulation disorders were advised by more than half of the gynaecologists in 2011 as well as in 2014.

### Late onset preeclampsia

Advices of respondents to postpartum women with late onset preeclampsia are described in **table 3**. There was a non-significant increase in the advice on a yearly blood pressure check; in 2011 36% of the respondents advised yearly blood pressure checks versus 46% in 2014 ( $p=0.063$ ).

**Table 1.** Baseline characteristics of respondents to the questionnaire, percentage of respondents

Characteristics	2011 (n =244)	2014 (n=167)	P-value
Gender, female	62% (n = 150)	56% (n=90) <sup>3</sup>	0.235
Working in university hospital	21% (n=51) <sup>1</sup>	15% (n=25) <sup>2</sup>	0.139
Working in teaching hospital	71% (n=172) <sup>1</sup>	66% (n=109) <sup>2</sup>	0.323
Respondents with registered perinatology sub-specialization	24% (n =59) <sup>1</sup>	28% (n=47) <sup>1</sup>	0.354

**Table 2.** Postpartum advices gynaecologists to women with *early* onset preeclampsia

Advice	2011 (n =244)	2014 (n=167)	P-value
Blood pressure, yearly check	53% (n=107) <sup>7</sup>	65% (n=89) <sup>1</sup>	0.023
Coagulation test	67% (n=136) <sup>5</sup>	58% (n=77) <sup>4</sup>	0.103
Glucose measurement	21% (n=43) <sup>8</sup>	24% (n=32) <sup>4</sup>	0.567
Lipid profile	17% (n=34) <sup>8</sup>	16% (n=22) <sup>3</sup>	0.905
Increase physical activity	35% (n=69) <sup>4</sup>	56% (n=75) <sup>9</sup>	<0.001
Smoking cessation	81% (n=163) <sup>7</sup>	84% (n=113) <sup>2</sup>	0.482
Weight loss	77% (n=157) <sup>6</sup>	68% (n=92) <sup>1</sup>	0.048

**Table 3.** Postpartum advices gynaecologists to women with *late* onset preeclampsia

Advice	2011 (n =244)	2014 (n=167)	P-value
Blood pressure, yearly check	36% (n=68) <sup>7</sup>	46% (n=60) <sup>1</sup>	0.063
Coagulation test	9% (n=17) <sup>5</sup>	9% (n=11) <sup>3</sup>	0.936
Glucose measurement	10% (n=19) <sup>8</sup>	9% (n=12) <sup>3</sup>	0.830
Lipid profile	3% (n=6) <sup>6</sup>	6% (n=8) <sup>1</sup>	0.195
Increase physical activity	32% (n=62) <sup>6</sup>	56% (n=72) <sup>2</sup>	<0.001
Smoking cessation	80% (n=153) <sup>6</sup>	77% (n=100) <sup>1</sup>	0.493
Weight loss	71% (n=137) <sup>5</sup>	67% (n=126) <sup>4</sup>	0.375

Laboratory testing for abnormalities in coagulation, glucose or lipid profiles were all advised by up to 10% of the respondents, with no significant increase on these recommendations over time (**table 3**). Increasing physical activity was significantly more often advised over time ( $p < 0.001$ ). Smoking cessation and weight loss were advised by more than half of the gynaecologists.

## DISCUSSION

In this study, we found that after preeclampsia an increasing number of gynaecologists advise women to yearly check their blood pressure and increase physical activity. In addition a large majority advise on smoking cessation and postpartum weight loss. Although these results sound promising there is a considerable scope for improvement; the most recent questionnaire of 2014 reveals that a small majority advise blood pressure measurements to women after *early* preeclampsia (65%) and increasing activity in both *early* and *late* preeclampsia (56%) while a bit less than half of the gynaecologists advise on blood pressure checks after *late* preeclampsia. This

indicates that almost half of the gynaecologists still miss an opportunity for counseling and management to reduce cardiovascular disease risks in this young population.

Early in life counseling of the women at risk for cardiovascular disease is important to create awareness on reducing risks and improving healthy lifestyle. Mosca et al. demonstrated that in women with increased risk of cardiovascular disease, education on prevention and creating awareness is essential for lifestyle and health improvements [15]. After preeclampsia this awareness can be created by gynaecologists through adequate advices directly postpartum. To fulfill this role, at first gynaecologists their selves have to be aware of the risks and the necessity of counseling and management. Only if they are sufficiently aware, they can adequately counsel and create awareness among these young women.

Most likely the awareness of postnatal caregivers can be improved by detailed guidelines on the subject of cardiovascular disease risk after hypertensive pregnancy disorders. Until recently, the guideline of the Dutch Society of Obstetrics and Gynaecology (NVOG) did not state any specific advice in follow up after hypertensive pregnancy disorders. Therefore at time of our questionnaires among Dutch gynecologists, there was a wide variety of postpartum advisement. In December 2014, but after the assessment for this study, the NVOG accepted the guideline on cardiovascular risk management after reproductive complications including preeclampsia (CVRM guideline) [16]. This guideline contains specific recommendations on follow up strategies for women with a complicated pregnancy. This new guideline may lead to further improvement of the role of gynaecologists in counseling and management for cardiovascular disease risks after preeclampsia with the ultimate goal to establish durable care for these women at risk.

Unfortunately there is little evidence of the best preventive strategies for women at risk for cardiovascular disease [17]. Most studies performed on preventive interventions include male subjects and could therefore not be directly applied to women. Furthermore, in the specific group of women with a history of preeclampsia, no research is performed, although these women might even experience a different reaction to the preventive interventions for cardiovascular disease [18]. Therefore, we propose a large randomized control trial on preventive interventions and the timing of these interventions in women who have had hypertensive complications in pregnancy.

To our knowledge, this is the first study to describe the role of gynaecologists in counseling and management of cardiovascular disease risks after preeclampsia. Previously Young et al. studied the awareness for preeclampsia as an independent risk factor for cardiovascular disease among residents internal medicine (n=118) and obstetrics-gynaecology (n=53). A minority of the residents stated that they included preeclampsia when asking a woman about the medical history (5% of the internists and 42% of the obstetric-gynaecology residents) and counseled women thereafter on their increased risk for cardiovascular disease (9% of the internists and 38% of the obstetric-gynaecology) [19]. These results implicate that a majority of these young doctors already miss the opportunity on early in life health improvements. In addition Nijdam et al. demonstrated that cardiovascular follow up of women after preeclampsia in primary care by general practitioners in the Netherlands was insufficient. Blood pressure measurements within three months postpartum were performed in 57% of women with a history of preeclampsia and checks for glucose or cholesterol levels in 3-9% of these women [20]. This indicates that there is a risk that women who are



not counseled properly by their gynaecologist postpartum, are lost to follow up and might miss an opportunity for healthy aging. Together with the findings in our study, still much progress on this subject can be made.

There are a few limitations to our study. First, there might be a response bias since in 2011 29% and in 2014 20% of the registered gynaecologists in the Netherlands responded to our survey request despite the fact that we sent a reminder. We assume that gynaecologists with interest in this topic more often returned the questionnaires on this subject, which might result in an overrating of awareness in gynaecologists. However, we asked gynaecologists if they were registered perinatology sub-specialization. In our study, 25% of the gynaecologists stated to have a perinatology sub-specialization which is consistent with the gynaecologist population in the Netherlands. Second there might be a bias due to social desirability on answers in our questionnaire. This could contribute to a higher assumed awareness on cardiovascular disease after pregnancy complicated by hypertensive in this study than in real time. Thirdly, due to the anonymous character of our study we could not assume we received results from identical respondents in 2011 and 2014. This impaired the possibility of paired analyses on our results and therefore the possibility to receive information on individual awareness improvement.

## CONCLUSION

An overall increasing number of gynaecologists advise women after preeclampsia on cardiovascular risk factor follow up. However there is a considerable scope for improvement since almost half of the gynaecologists still miss an opportunity for counseling and management to reduce cardiovascular disease risks in this young population.

**Addendum** – Questionnaires on intervention and follow-up after preeclampsia

In what type of hospital do you work?

Academically / Teaching hospital / Non-teaching hospital

Is your subspecialty in perinatology?

Yes / No

How many patients with *early* preeclampsia are treated at your ward monthly? And how many patients with *late* preeclampsia?

- number -

Which of these advises do you give post partum to women with *early* preeclampsia? And which advise to women with *late* preeclampsia?

Coagulation test

Glucose screening

Lipid profile

Yearly blood pressure measurements

Life style advise; increasing physical activity, smoking cessation, weight reduction

## REFERENCES

1. Bouvier-Colle MH, Mohangoo AD, Gissler M, Novak-Antolic Z, Vutuc C, Szamotulska K, et al. What about the mothers? An analysis of maternal mortality and morbidity in perinatal health surveillance systems in Europe. *Bjog*, 2012. 119(7): p. 880-9; discussion 890.
2. Bellamy L, Casas JP, Hingorani AD, Williams DJ. Pre-eclampsia and risk of cardiovascular disease and cancer in later life: systematic review and meta-analysis. *Bmj*, 2007. 335(7627): p. 974.
3. McDonald SD, Malinowski A, Zhou Q, Yusuf S, Devereaux PJ. Cardiovascular sequelae of pre-eclampsia/eclampsia: a systematic review and meta-analyses. *Am Heart J*, 2008. 156(5): p. 918-30.
4. Ray JG, Vermeulen MJ, Schull MJ, Redelmeier DA. Cardiovascular health after maternal placental syndromes (CHAMPS): population-based retrospective cohort study. *Lancet*, 2005. 366(9499): p. 1797-803.
5. Sattar N, Greer IA. Pregnancy complications and maternal cardiovascular risk: opportunities for intervention and screening?. *Bmj*, 2002. 325(7356): p. 157-60.
6. Smith GC, Pell JP, Walsh D. Pregnancy complications and maternal risk of ischaemic heart disease: a retrospective cohort study of 129,290 births. *Lancet*, 2001. 357(9273): p. 2002-6.
7. Jacobs AK, Eckel RH. Evaluating and managing cardiovascular disease in women: understanding a woman's heart. *Circulation*, 2005. 111(4): p. 383-4.
8. Organisation NAWH. Non-Communicable Diseases: A Priority for Women's Health and Development. 2011.
9. Nicklas JM, Zera CA, England LJ, Rosner BA, Horton E, Levkoff SE, et al. A web-based lifestyle intervention for women with recent gestational diabetes mellitus: a randomized controlled trial. *Obstet Gynecol*. 2014 Sep;124(3):563-70.
10. Mosca L, Benjamin EJ, Berra K, Bezanson JL, Dolor RJ, Lloyd-Jones DM, et al. Effectiveness-based guidelines for the prevention of cardiovascular disease in women--2011 update: a guideline from the American heart association. *Circulation*, 2011. 123(11): p. 1243-62.
11. American College of Obstetricians and Gynecologists; Task Force on Hypertension in Pregnancy. Hypertension in pregnancy. Report of the American College of Obstetricians and Gynecologists' Task Force on Hypertension in Pregnancy. *Obstet Gynecol*, 2013. 122(5): p. 1122-31.
12. ACOG guideline; hypertensive disorders in pregnancy, 2013, cited 2014; Available from: [https://www.health.ny.gov/professionals/protocols\\_and\\_guidelines](https://www.health.ny.gov/professionals/protocols_and_guidelines) 2010
13. Gillon TE, Pels A, von Dadelszen P, MacDonell K, Magee LA. Hypertensive disorders of pregnancy: a systematic review of international clinical practice guidelines. *PLoS One*, 2014. Dec 1;9(12):e113715.

14. Tranquilli AL, Dekker G, Magee L, Roberts J, Sibai BM, Steyn W, Zeeman GG, Brown MA. The classification, diagnosis and management of the hypertensive disorders of pregnancy: A revised statement from the ISSHP, 2014. *Pregnancy Hypertension*, 2014. Volume 4, Issue 2, Pages 97–104.
15. Mosca L, Mochari H, Christian A, Berra K, Taubert K, Mills T, et al. National study of women's awareness, preventive action, and barriers to cardiovascular health. *Circulation*, 2006. 113(4): p. 525-34.
16. Guideline on Cardiovascular Risk Management after Reproductive Disease by the Dutch Society of Obstetrics and Gynaecology (NVOG), available at [www.nvog.nl](http://www.nvog.nl).
17. Mosca L, Benjamin EJ, Berra K, Bezanson JL, Dolor RJ, Lloyd-Jones DM, et al. Effectiveness-based guidelines for the prevention of cardiovascular disease in women--2011 update: a guideline from the American Heart Association. *Circulation*, 2011. 123(11): p. 1243-62.
18. Abramson BL, Melvin RG. Cardiovascular risk in women: focus on hypertension. *Can J Cardiol*. 2014 May;30(5):553-9.
19. Young B, Hacker MR, Rana S. Physicians' knowledge of future vascular disease in women with preeclampsia. *Hypertens Pregnancy*, 2012. 31(1): p. 50-8.
20. Nijdam ME, Timmerman MR, Franx A. Cardiovascular risk factor assessment after pre-eclampsia in primary care. *BMC Fam Pract*, 2009. 10: p. 77.