

評価対象論文リスト(要因:妊娠中に妊娠高血圧症候群があった人、アウトカム:循環器病)

評価判定日:2025/5/29

①既存の系統的レビュー・メタ解析・統合解析

1	Montgomery KS, Hensley C, Winseman A, Marshall C, Robles A. A Systematic Review of Complications Following Pre-eclampsia. <i>Matern Child Health J.</i> 2024;28(11):1876-1885. doi:10.1007/s10995-024-03999-z
2	Atkinson J, Simpson G, Walker SP, Tong S, Hastie R, Lindquist A. The long-term risk of cardiovascular disease among women with a history of hypertensive disorders of pregnancy: a systematic review of clinical practice guidelines. <i>BMC Cardiovasc Disord.</i> 2023;23(1):443. Published 2023 Sep 9.
3	Al-Huda F, Shapiro GD, Davenport MH, Bertagnolli M, Dayan N. Association between Cardiorespiratory Fitness and Hypertensive Disorders of Pregnancy: A Systematic Review and Meta-Analysis. <i>J Clin Med.</i> 2022;11(15):4364. Published 2022 Jul 27. doi:10.3390/jcm11154364
4	Okoth K, Chandan JS, Marshall T, et al. Association between the reproductive health of young women and cardiovascular disease in later life: umbrella review [published correction appears in <i>BMJ.</i> 2020 Oct 14;371:m3963. doi: 10.1136/bmj.m3963.]. <i>BMJ.</i> 2020;371:m3502. Published 2020 Oct 7.
5	Lo CCW, Lo ACQ, Leow SH, et al. Future Cardiovascular Disease Risk for Women With Gestational Hypertension: A Systematic Review and Meta-Analysis. <i>J Am Heart Assoc.</i> 2020;9(13):e013991. doi:10.1161/JAHA.119.013991
6	Wu R, Wang T, Gu R, et al. Hypertensive Disorders of Pregnancy and Risk of Cardiovascular Disease-Related Morbidity and Mortality: A Systematic Review and Meta-Analysis. <i>Cardiology.</i> 2020;145(10):633-647. doi:10.1159/000508036
7	Grandi SM, Filion KB, Yoon S, et al. Cardiovascular Disease-Related Morbidity and Mortality in Women With a History of Pregnancy Complications [published correction appears in <i>Circulation.</i> 2019 Aug 27;140(9):e544. doi: 10.1161/CIR.0000000000000718.]. <i>Circulation.</i> 2019;139(8):1069-1079.
8	Stuart JJ, Bairey Merz CN, Berga SL, et al. Maternal recall of hypertensive disorders in pregnancy: a systematic review. <i>J Womens Health (Larchmt).</i> 2013;22(1):37-47. doi:10.1089/jwh.2012.3740
9	Brohan MP, Daly FP, Kelly L, et al. Hypertensive disorders of pregnancy and long-term risk of maternal stroke-a systematic review and meta-analysis. <i>Am J Obstet Gynecol.</i> 2023;229(3):248-268. doi:10.1016/j.ajog.2023.03.034

②日本人集団の個別疫学研究

10	Watanabe M, Sairenchi T, Nishida K, et al. Gestational Hypertension as Risk Factor of Hypertension in Middle-Aged and Older Women. <i>Int J Environ Res Public Health.</i> 2020;17(11):4052. Published 2020 Jun 5. doi:10.3390/ijerph17114052
11	Watanabe K, Kimura C, Iwasaki A, et al. Pregnancy-induced hypertension is associated with an increase in the prevalence of cardiovascular disease risk factors in Japanese women. <i>Menopause.</i> 2015;22(6):656-659. doi:10.1097/GME.0000000000000361
12	Kurabayashi T, Mizunuma H, Kubota T, Kiyohara Y, Nagai K, Hayashi K. Pregnancy-induced hypertension is associated with maternal history and a risk of cardiovascular disease in later life: Japanese cross-sectional study. <i>Maturitas.</i> 2013;75(3):227-231. doi:10.1016/j.maturitas.2013.04.002

■メタ解析、系統的レビュー

Reference			Include study					Design	Category	Relative risk (95% CI or p)	Weight	Magnitude of association	
Author	Title	Year	Ref No.	First author	Year	Study period	Study location	Event (*Definition)					
Lo CCW, Lo ACQ, Leow SH, Fisher G, Corker B, Batho O, Morris B, Chowaniec M, Vladutiu CJ, Fraser A, Oliver-Williams C.	Future Cardiovascular Disease Risk for Women With Gestational Hypertension: A Systematic Review and Meta-Analysis	2020											
			Cardiovascular Disease										
								Events/Participants (N)					
			Luoto 2008					2008 Mean 44 years	98/4,000	1.17 (0.98, 1.40)			
			Cirillo 2015					2015 Range 44-52 years	9,000/13,640	1.28 (0.94, 1.74)			
			Andolf 2017					2017 Mean 35 years	18,191/278,591	1.28 (1.17, 1.40)			
			Yeh 2014					2014 Median 5.8 years	182/13,640	2.00 (1.26, 3.18)			
			Theilen 2016					2016 Max 73 years	NG/150,234	2.39 (1.78, 3.21)			
			Schmiegelow 2008					2008 Median 4.5 years	374/273,101	2.77 (1.47, 5.21)			
			Tooher 2007					2007 Median 20 years	NG/31,656	2.78 (1.87, 4.13)			
			Kestenbaum 2003					2003 Mean 7.8 years	83/103,589	2.80 (1.62, 4.85)			
			Subtotal							1.81 (1.42, 2.32)		↑↑	
			Coronary Heart Disease										
			Andolf 2017					2017 Mean 35 years	10,755/278,591	1.26 (1.13, 1.40)		NG indicates not given	
			Mannisto 2013					2013 Mean 39.4 years	1,225/7,543	1.44 (1.24, 1.68)			
			Theilen 2016					2016 Max 73 years	NG/150,234	2.77 (1.63, 4.72)			
			Tooher 2007					2007 Median 20 years	NG/31,656	3.19 (2.11, 4.83)			
			Subtotal (I-squared = 88% (72-95%), p<0.001)							1.83 (1.33, 2.51)		↑↑	
			Stroke										
			Tooher 2017					2017 Median 20 years	NG/27,887	0.57 (0.14, 2.32)			
			Andolf 2017					2017 Mean 35 years	7,426/278,591	1.30 (1.14, 1.48)			
			Theilen 2016					2016 Max 73 years	NG/150234	2.97 (1.49, 5.92)			
			Subtotal (I-squared = 70% (0-91%), p=0.035)							1.50 (0.75, 2.99)		↑	
			Heart Failure										
			Andolf 2017					2017 Mean 35 years	3,165/278,591	1.52 (1.28, 1.80)			
			Mannisto 2013					2013 Mean 39.4 years	486/963,263	1.79 (1.44, 2.23)			
			Behrens 2016					2016 Mean 17.9 years	3581/150,234	2.07 (1.70, 2.52)			
			Subtotal (I-squared = 63.4%, p=0.065)							1.77 (1.47, 2.13)		↑↑	
Grandi SM, Filion KB, Yoon S, Ayele HT, Doyle CM, Hutcheon JA, Smith GN, Gore GC, Ray JG, Nerenberg K, Platt RW.	Cardiovascular Disease-Related Morbidity and Mortality in Women With a History of Pregnancy Complications	2019											
			Cardiovascular-related morbidity*										
			(*Including coronary artery disease, myocardial infarction, coronary revascularization, peripheral arterial disease, transient ischemic attack, and stroke)										
								Gestational Hypertention	No Gestational Hypertention	OR (95% CI)			
								Cases	Controls	Cases	Controls		
			Bhattacharya et al. 2012					32,828	397	8,494	972	1.28 (1.08, 1.50)	
			Behrens et al. 2016					1,034,508	30	11,187	1,152	1.83 (1.12, 2.99)	
			Cain et al. 2016					283,825	178	17,674	2,269	0.99 (0.83, 1.18)	
			Kestenbaum et al. 2003					103,589	19	10,508	64	2.80 (1.41, 3.06)	
			Lykke et al. 2010					748,461	NR	NR	NR	2.47 (1.59, 3.83)	
			McDonald et al. 2016					289	21	22	75	1.11 (0.41, 2.99)	
			Ray et al. 2005					989,283	NR	NR	NR	1.80 (1.36, 2.39)	
			Wikstrom et al. 2005					5,765	97	7,039	2,306	1.60 (1.22, 2.09)	
			Yeh et al. 2014					5,765	NR	NR	NR	2.00 (1.12, 3.56)	
			Random Effects Summary									1.67 (1.28, 2.19)	↑
			Cerebrovascular-related morbidity										
								Gestational Diabetes	No Gestational Diabetes	OR (95% CI)			
								Cases	Controls	Cases	Controls		
			Bhattacharya et al. 2012					32,828	117	8,774	266	1.28 (0.98, 1.68)	
			Lin et al. 2016					1,20,774	13	7,377	60	3.72 (3.61, 3.83)	
			Lykke et al. 2009					748,461	147	7,302	8,240	1.51 (1.20, 1.89)	
			Wilson et al. 2003					740	22	423	13	1.53 (0.60, 3.93)	
			Random Effects Summary									1.83 (0.79, 4.22)	↑

Brohan MP, Daly FP, Kelly L, McCarthy FP, Khashan AS, Kublickiene K, Barrett PM.	Hypertensive disorders of pregnancy and long-term risk of maternal stroke-a systematic review and meta-analysis	2023	Exposure: hypertensive disorders of pregnancy			
			Outcome	Number of studies	Number of part	Pooled RR (95% CI)
			Any stroke			
			Crude	5	1,557,939	2.00 (1.42-2.82)
			Adjusted	8	2,830,171	1.74 (1.45-2.10)
			Ischemic stroke 虚血性			
			Crude	1	1,303,365	2.25 (1.85-2.73)
			Adjusted	2	2,539,215	1.65 (1.44-1.88)
			Hemorrhagic stroke 出血性			
			Crude	1	1,303,365	1.85 (1.34-2.55)
			Adjusted	2	2,539,215	2.26 (1.32-3.87)
			Exposure: gestational hypertension			
			Outcome	Number of studies	Number of participants	Pooled RR (95% CI)
			Any stroke			
Crude	2	1,140,422	1.18 (1.14-1.21)			
Adjusted	5	2,411,521	1.23 (1.20-1.26)			
Ischemic stroke 虚血性						
Crude	2	1,115,882	1.53 (1.01-2.32)			
Adjusted	3	2,351,732	1.35 (1.19-1.53)			
Hemorrhagic stroke 出血性						
Crude	1	1,105,568	1.04 (0.98-1.10)			
Adjusted	3	2,483,148	2.66 (1.02-6.98)			

■ ケースコントロール研究

Watanabe M, Sairenchi T, Nishida K, et al. Gestational Hypertension as Risk Factor of Hypertension in Middle-Aged and Older Women. *Int J Environ Res Public Health*. 2020;17(11):4052. Published 2020 Jun 5. doi:10.3390/ijerph17114052

Age at recruitment, mean (SD), years 63.1 (8.4) 57.7 (9.4)

Case Hypertension (+) (systolic blood pressure 140 mmHg and/or diastolic blood pressure 90 mmHg)

(Table 2より作成: Risk of hypertension according to HDP subtypes)

HDP	No. of Cases/Controls	Crude OR (95% CI)	Crude p-Value	Model 1 ¹ OR (95% CI)	Model 1 p-Value	Model 2 ² OR (95% CI)	Model 2 p-Value
No	42/69	1.00		1.00		1.00	
Yes							
GH	14/3	7.7 (2.1–28.3)	0.002	4.8 (1.2–18.9)	0.024	4.2 (1.0–17.5)	0.051
PE	0/1						
Another type	6/2	4.9 (1.0–25.6)	0.058	3.7 (0.7–19.9)	0.132	3.2 (0.5–20.1)	0.22

CI, confidence interval; GH, gestational hypertension; HDP, hypertensive disorders of pregnancy;

OR, odds ratio; PE, pre-eclampsia.

¹ Adjusted for age and body-mass index at recruitment.

² Adjusted for age and body-mass index at recruitment, age at delivery, and prepregnancy body-mass index.