Léčba neplodnosti, komplikace těhotenství a následné KV riziko

Renata Cífková

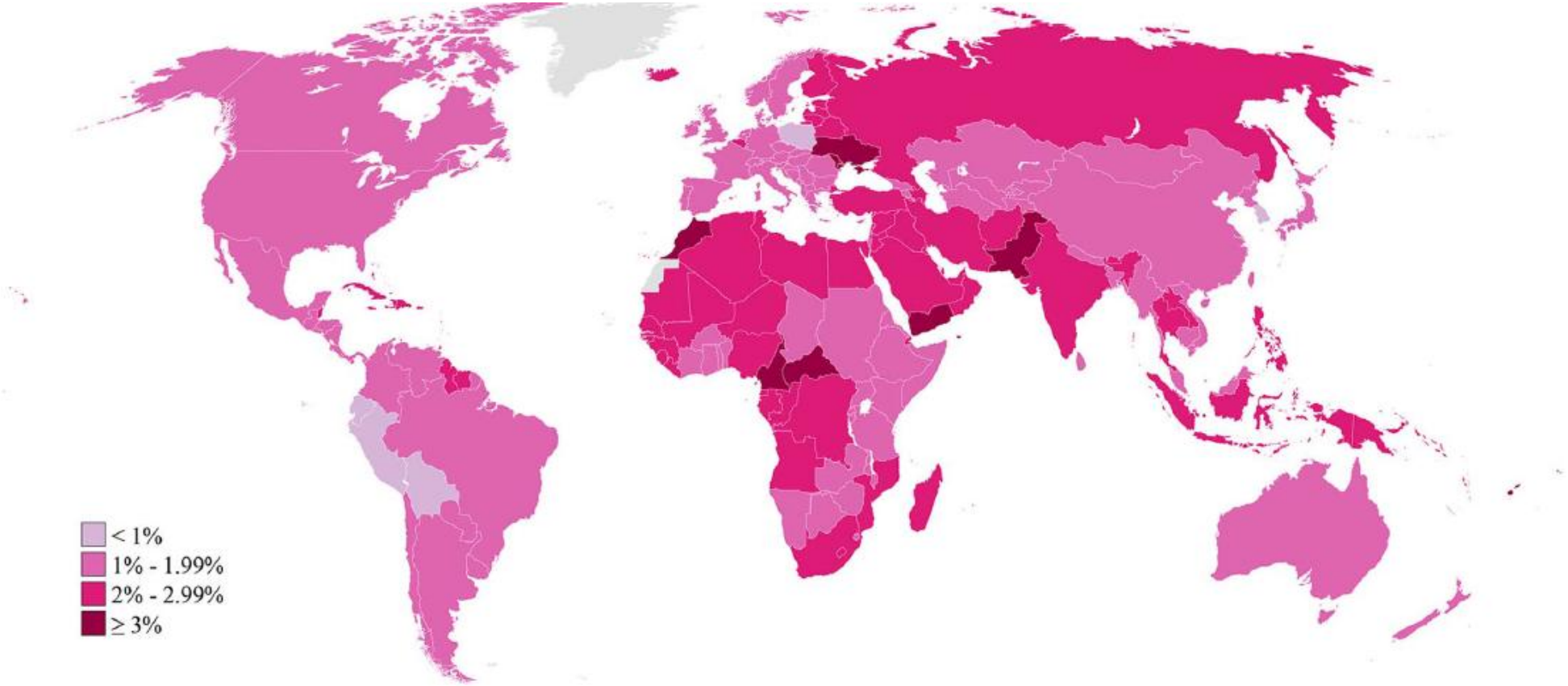
Centrum kardiovaskulární prevence 1. LF UK a TN

II. interní klinika 1. LF UK a VFN

Praha

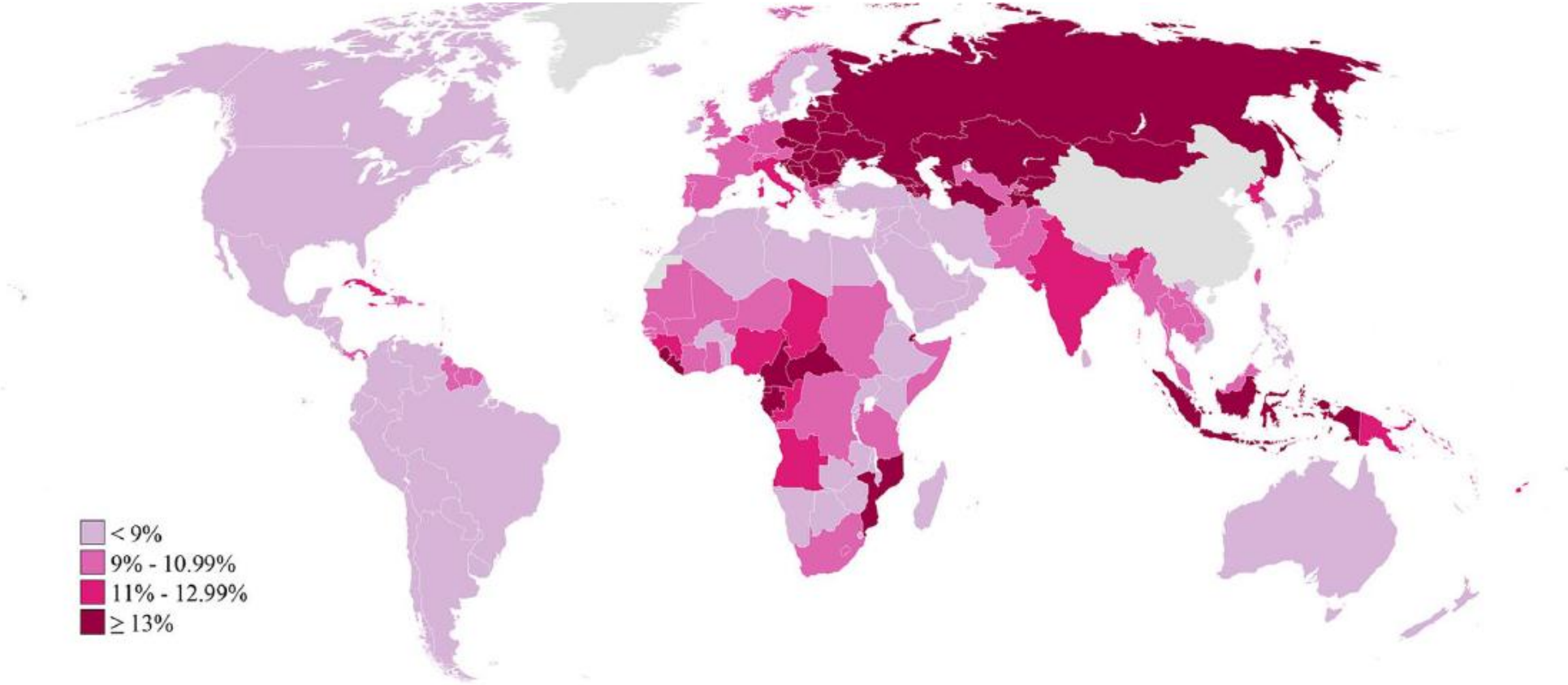
XXXI. VÝROČNÍ SJEZD ČESKÉ KARDIOLOGICKÉ SPOLEČNOSTI

Prevalence primární infertility u žen ve věku 20-44 let 2010



PLoS Med. 2012;9(12):e1001356. doi:10.1371/journal.pmed.1001356.

Prevalence sekundární infertility u žen ve věku 20-44 let 2010



PLoS Med. 2012;9(12):e1001356
doi:10.1371/journal.pmed.1001356

Metody asistované reprodukce

Asistovaná reprodukce

Assisted reproductive technology, ART

- 2-6 % dětí v zemích s vysokými příjmy
- > 8 mil. dětí

Infertility, fertility treatment, and risk of hypertension

Leslie V. Farland, Sc.M.,[a] Francine Grodstein, Sc.D.,[a,b] Serene S. Srouji, M.D.,[c] John P. Forman, M.D., M.Sc.,[b,d] Janet Rich-Edwards, Sc.D.,[a,b,e] Jorge E. Chavarro, M.D., Sc.D.,[a,d,f] and Stacey A. Missmer, Sc.D.[a,b,c]

[a] Department of Epidemiology, Harvard School of Public Health; [b] Channing Division of Network Medicine and [c] Department of Obstetrics, Gynecology, and Reproductive Biology, Brigham and Women's Hospital; [d] Renal Division, Brigham and Women's Hospital and Harvard Medical School; [e] Connors Center for Women's Health and Gender Biology, Brigham and Women's Hospital; and [f] Department of Nutrition, Harvard School of Public Health, Boston, Massachusetts

Nurses´ Health Study

- **Design**: prospektivní kohortová studie
- **Pacienti**: 116 430 zdravotních sester; FU 1993–2011
- **Závěry**: bez zvýšeného rizika rozvoje hypertenze u žen, které byly dříve léčeny pro infertilitu.

Fertil Steril 2015;104:391-7

Increased incidence of gestational hypertension and preeclampsia after assisted reproductive technology treatment

Yueping A. Wang, Ph.D.,[a,b] Abrar A. Chughtai, Ph.D.,[b] Cynthia M. Farquhar, M.D.,[c] Wendy Pollock, Ph.D.,[d] Kei Lui, M.D.,[b] and Elizabeth A. Sullivan, M.D.[a,b]

[a] Faculty of Health, University of Technology Sydney, Ultimo and [b] School of Women's and Children's Health, University of New South Wales, Sydney, New South Wales, Australia; [c] Department of Obstetrics and Gynaecology, University of Auckland, Auckland, New Zealand; and [d] Mercy Hospital for Women, La Trobe University, Melbourne, Victoria, Australia

- Design: retrospektivní populační studie
- Pacienti: 596 520 matek (3,6 % asist. reprodukce), které porodily 2007–2011
- Závěr: *Mnohočetná těhotenství* po asistované reprodukci jsou nejpravděpodobnějším vysvětlením pro zvýšenou incidenci gestační hypertenze a preeklampsie u matek, které se podrobily asistované reprodukci.

Wang YA et al., Fertil Steril 2016

Received: 12 May 2016 | Revised: 7 July 2016 | Accepted: 23 July 2016
DOI: 10.1111/jch.12945

ORIGINAL PAPER

WILEY

Risk of hypertensive disorders in pregnancy following assisted reproductive technology: overview and meta-analysis

Costas Thomopoulos MD[1] | George Salamalekis MD[2] | Konstantinos Kintis MD[3] | Iliana Andrianopoulou BDN[1] | Helena Michalopoulou MD[1] | George Skalis MD[1] | Stefanos Archontakis MD[1] | Ourania Argyri MD[1] | Costas Tsioufis MD[3] | Thomas K. Makris MD[1] | Emmanuel Salamalekis MD[2]

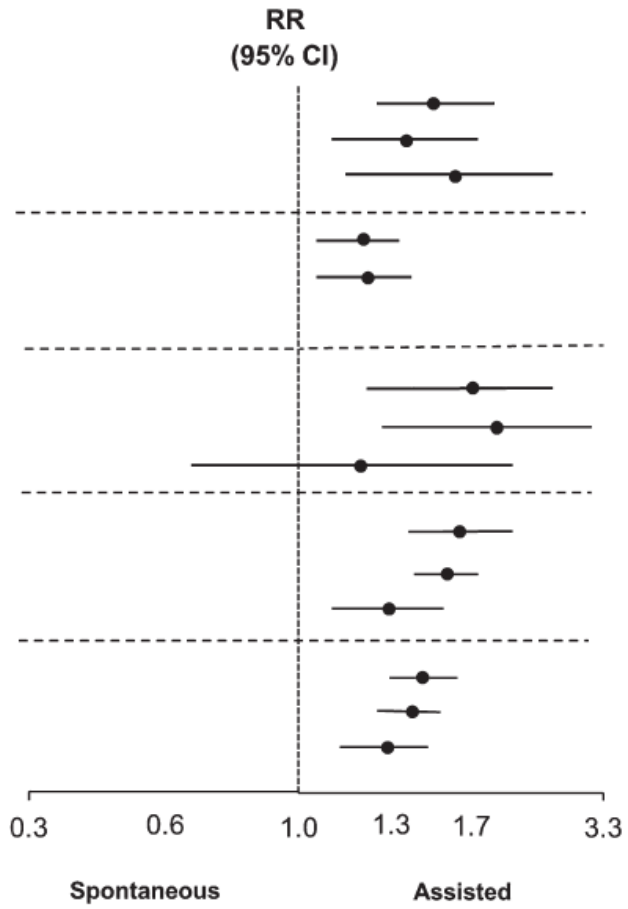
- **66 longitudinálních studií;** 7 038 029 těhotenství
  203 375 po asistované reprodukci

- **Závěry:** Všechny formy hypertenze v těhotenství byly po asistované reprodukci významně zvýšeny, nezávisle na pořadí těhotenství:
  - gestační hypertenze +79 % 95% CI, 24 %–157 %)
  - preeklampsie +75 % (95% CI, 50 %– 103 %)
  - PHD +54 % (95% CI, 39 %–70 %)

J Clin Hypertens 2017; 19: 173–183

Hypertenze v těhotenství po asistované reprodukci

Intervention/Outcome	N of studies	Heterogeneity	Events (n/participants) Assisted	Events (n/participants) Spontaneous	RR (95% CI)	P value
A. OI/PE						
All orders	7	44%, 0.095	332/5209	9623/212965	1.56 (1.27-1.91)	
Singletons	4	71%, 0.017	296/4619	9559/210804	1.48 (1.12-1.96)	.47
Nonsingletons	2	0%, 0.93	33/168	53/503	1.78 (1.19-2.65)	
B. OI/PHD						
All orders	3	0%, 0.39	144/1557	2905/39503	1.24 (1.05-1.45)	
Singletons	2	19%, 0.27	138/1485	2893/39382	1.26 (1.04-1.52)	NA
Nonsingletons	1	NA	-	-	-	
C. Invasive ART/GH						
All orders	8	76%, <0.001	202/2639	2757/68955	1.79 (1.24-2.57)	
Singletons	5	78%, 0.001	129/1764	2348/54685	2.06 (1.30-3.26)	.18
Non-singletons	4	40%, 0.21	51/375	85/700	1.22 (0.67-2.23)	
D. Invasive ART/PE						
All orders	35	95%, <0.001	5030 / 97394	134630 / 4943930	1.75 (1.50-2.03)	
Singletons	17	44%, 0.026	2987 / 72794	75958 / 2888454	1.65 (1.53-1.77)	.005
Nonsingletons	14	67%, <0.001	927 / 10198	2400 / 30555	1.34 (1.10-1.65)	
E. Invasive ART/PHD						
All orders	40	86%, <0.001	9232 / 126494	78695 / 1792440	1.54 (1.39-1.70)	
Singletons	25	76%, 0.001	6083 / 99229	69399 / 1686337	1.47 (1.35-1.61)	.081
Nonsingletons	23	70%, <0.001	3069 / 26180	8446 / 86409	1.33 (1.17-1.51)	



J Clin Hypertens 2017; 19: 173–183

RESEARCH Open Access

Assisted reproductive technology and hypertensive disorders of pregnancy: systematic review and meta-analyses

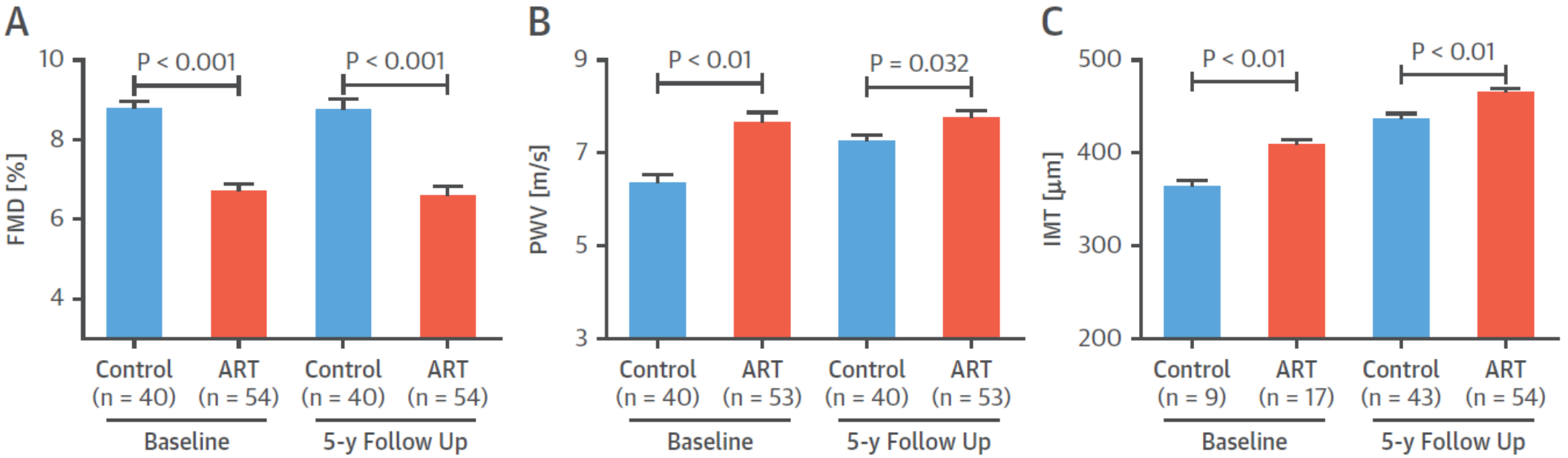
Hui Ju Chih[1], Flavia T. S. Elias[1,2], Laura Gaudet[1] and Maria P. Velez[1,3*]

- 85 studií; 405 920 IVF/ICSI těhotenství a 8 122 210 spontánně počatých těhotenství
- IVF/ICSI OR 1,70 (1,60-1,80) u jednočetných těhotenství
  OR 1,34 (1.20-1.50) u mnohočetných těhotenství

- **Závěr**: ***ART těhotenství jsou spojena s vyšším rizikem rozvoje hypertenze v těhotenství a preeklampsie***, zvl. vysoké riziko při transferu zmraženého embrya nebo v případě darování vajíček

BMC Pregnancy Childbirth 2021;21: 449

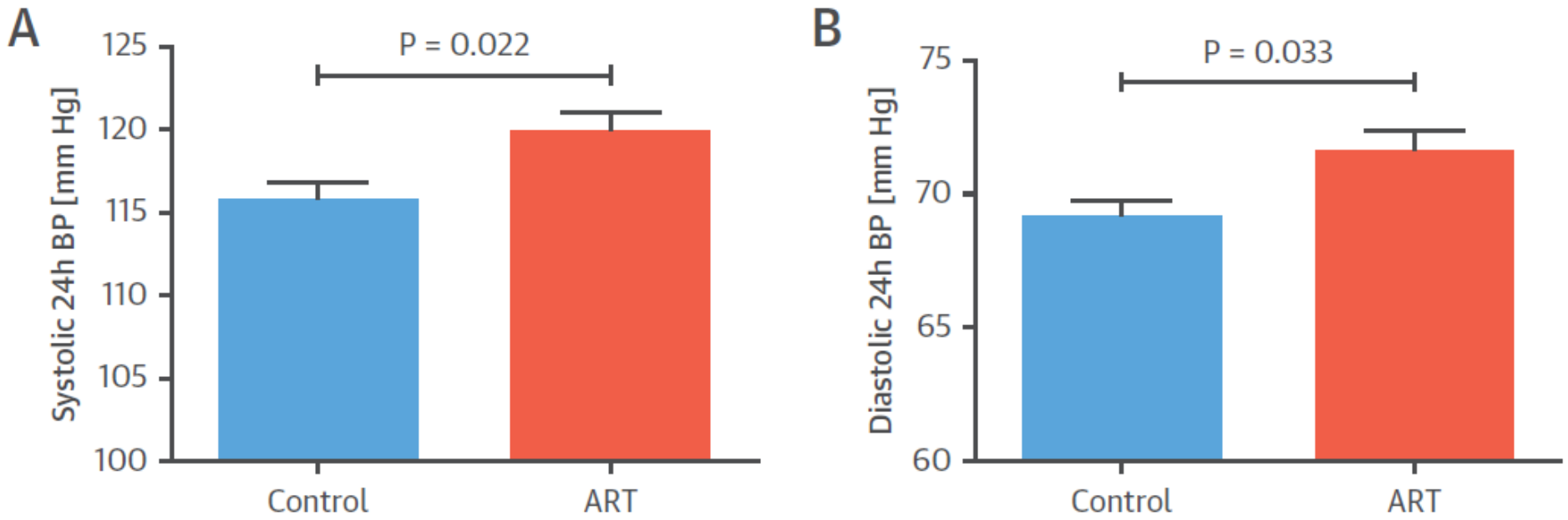
Předčasné stárnutí cév dětí počatých asistovanou reprodukcí přetrvává do období adolescence



(A) Flow-mediated dilation (FMD, **(B)** pulse wave velocity (PVW), and **(C)** intima-media thickness (IMT) at baseline (mean ± SD age, control 11.8 ± 2.2 years; assisted reproductive technologies [ART] 10.9 ± 2.4 years) and at 5-year follow-up (mean age; control 17.6 ± 2.7 years; assisted reproductive technologies 16.6 ± 2.4 year) in subjects conceived through assisted reproductive technologies and naturally conceived control subjects. Premature vascular aging, as evidenced by impaired flow-mediated dilation and by increased pulse wave velocity and intima-media thickness, persists at 5-years follow up in subjects conceived through assisted reproductive technologies. Data are shown as mean ± SD.

JACC 2018; 72:1267-1274

24hod. monitorace TK u osob počatých asistovanou reprodukcí a kontrolních osob



(A) Systolic and **(B)** diastolic 24-h ambulatory blood pressure (BP) was significantly higher in subjects conceived through assisted reproductive technologies (ART) (n = 52) than in control subjects (n = 43). Data are shown as mean ± SD.

JACC 2018; 72:1267-1274

JAMA Network Open

Original Investigation | Cardiology

Assessment of Cardiovascular Health of Children Ages 6 to 10 Years Conceived by Assisted Reproductive Technology

Linlin Cui, MD, PhD; Min Zhao, PhD; Zhirong Zhang, MD, PhD; Wei Zhou, MD, PhD; Jianan Lv, MD; Jingmei Hu, MD, PhD; Jinlong Ma, MD, PhD; Mei Fang, MS; Lili Yang, MS; Costan G. Magnussen, PhD; Bo Xi, PhD; Zi-Jiang Chen, MD, PhD

- 764 dětí ve věku 6-10 let
  - 382 ART
  - 382 spontánní početí

- Závěry: Děti počaté asistovanou reprodukcí měly vyšší hodnoty TK a méně příznivé echokardiografické parametry.

JAMA Network Open. 2021;4(11):e2132602.
doi:10.1001/jamanetworkopen.2021.32602

Opakované spontánní potraty

- Všechny samovolné potraty od početí do 24. týdne těhotenství
- ≥ 2 po sobě následující těhotenství
- 1-2% žen v reprodukčním věku

OPEN ACCESS

Miscarriage and future maternal cardiovascular disease: a systematic review and meta-analysis

Clare Teresa Oliver-Williams,[1] Emma E Heydon,[1] Gordon C S Smith,[2] Angela M Wood[1]

[1]Department of Public Health and Primary Care, University of Cambridge, Cambridge, UK
[2]Department of Obstetrics and Gynaecology, University of Cambridge, Cambridge, UK

Correspondence to
Clare Teresa Oliver-Williams, Cardiovascular Epidemiology Unit, Department of Public

ABSTRACT

Context The 2011 American Heart Association guidelines identified pregnancy complications as a risk factor for cardiovascular disease in women. However, miscarriage was not mentioned within the guidelines, and there is no consensus on the association between miscarriage and future risk of cardiovascular disease.

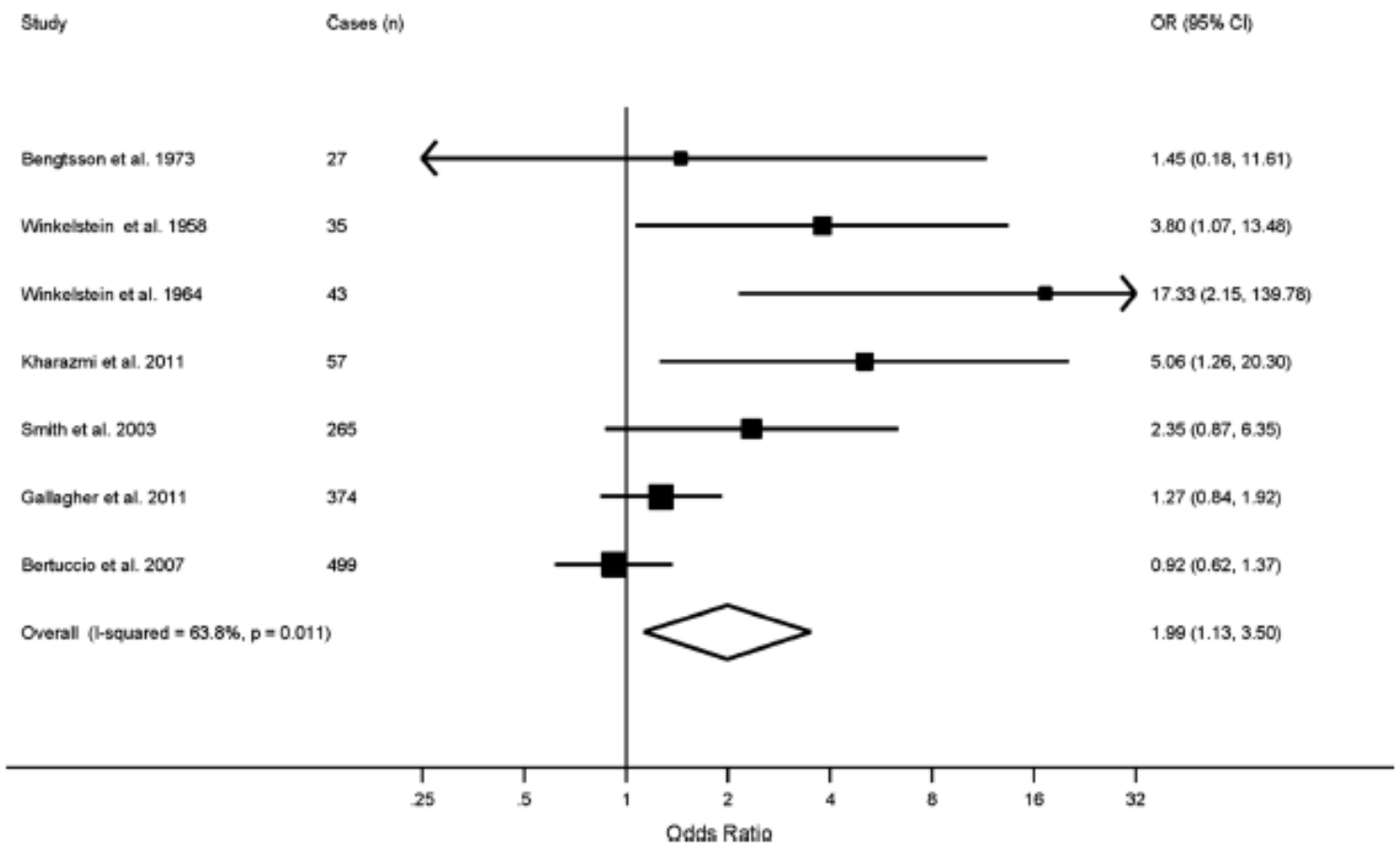
Objective To confirm or refute the association, a meta-analysis of published papers was conducted.

pregnancy can improve risk prediction was recently acknowledged in the 2011 American Heart Association guidelines, which incorporated obstetric complications in the classification of cardiovascular disease (CVD) risk in women.[2] The cardiovascular impact of a range of obstetric complications was discussed, including pre-eclampsia,[3–5] preterm birth[4 6 7] and gestational diabetes.[8 9] However, the long-term cardiovascular implications

- 10 studies with 517 504 women for CHD meta-analysis
- 134 461 women for cerebrovascular disease meta-analysis

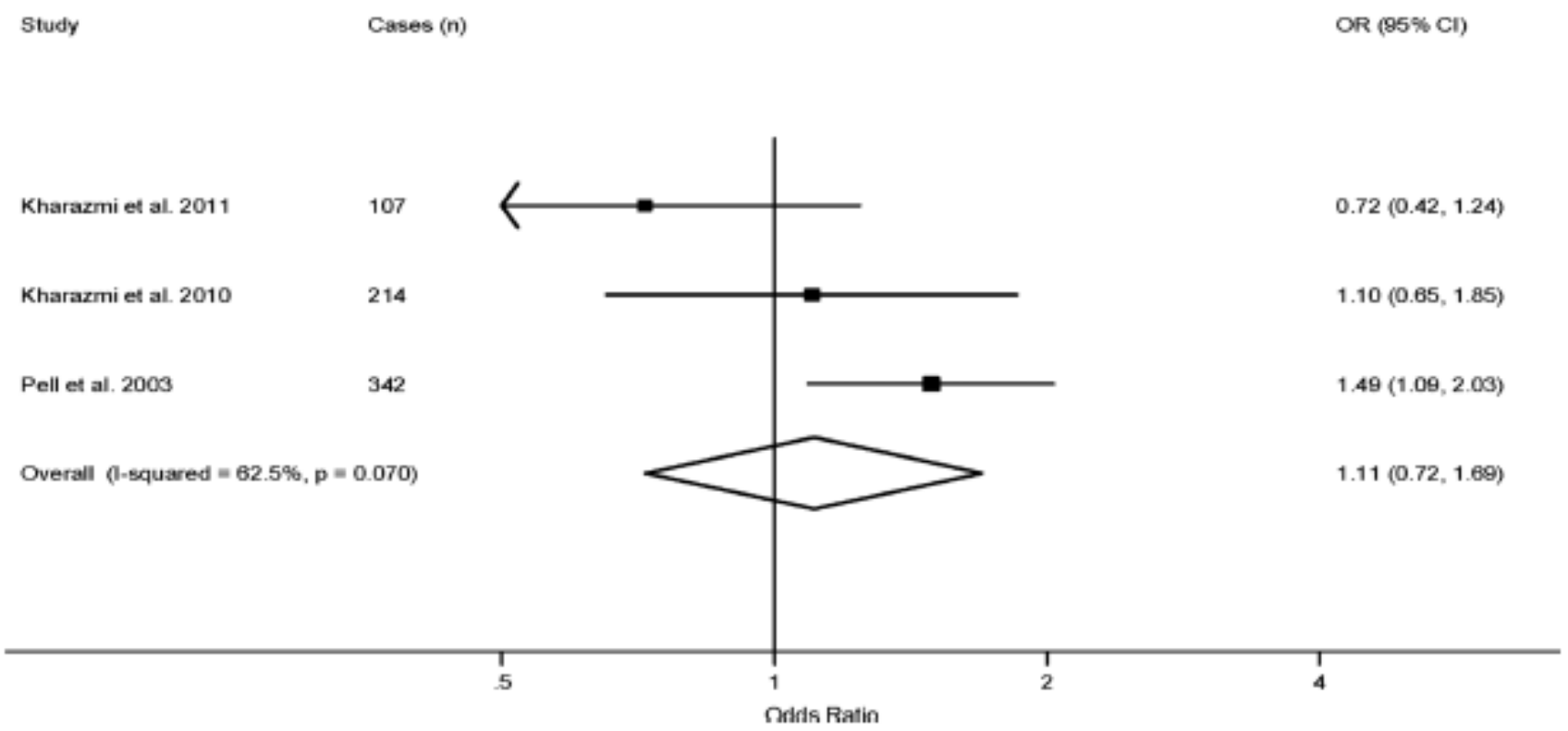
Heart 2013;99:1636-1644

Recurrent miscarriage and CHD



Heart 2013;99:1636-1644

History of miscarriage and cerebrovascular disease



Heart 2013;99:1636-1644

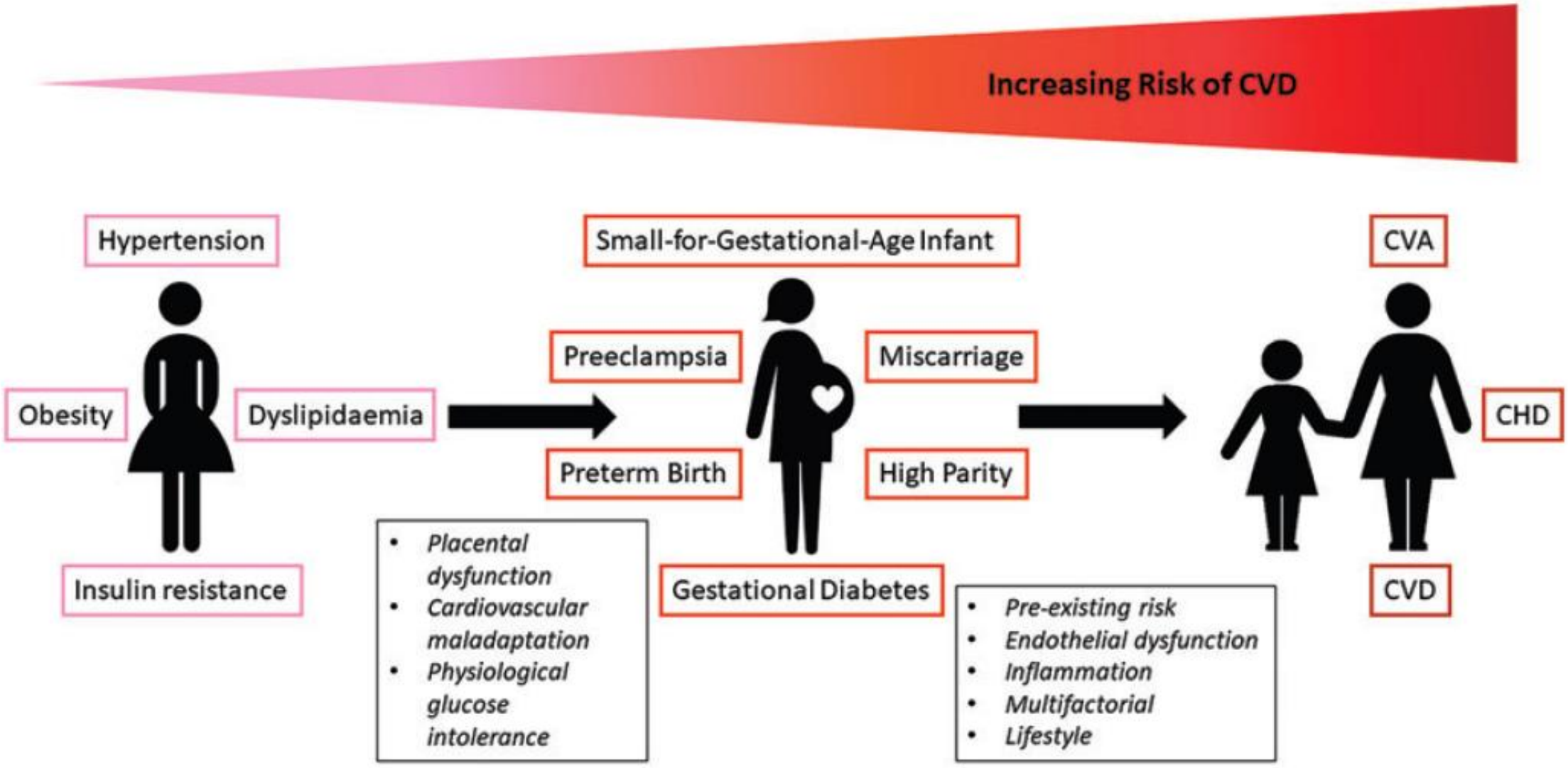
Komplikace těhotenství

Adverse pregnancy outcomes

Jedna nebo několik komplikací u matky nebo plodu: 10-15%

- Hypertenze v těhotenství (preeklampsie, gestační hypertenze)
- Gestační diabetes
- Předčasný porod – po 20. týdnu a před ukončením 37. týdne
- Růstová restrikce plodu
- Nízká porodní hmotnost - < 2 500 g
- Small for gestational age - < 10. percentil referenčních hodnot
- Large for gestational age - > 90. percentil referenčních hodnot

Association between adverse pregnancy outcomes and CVD risk



J Wom Health 2019;28: 1037-1050

Komplikace těhotenství a KVO

Pregnancy outcome/ reproductive risk factors	Outcome association	Strength of Evidence*
Hypertensive disorders of pregnancy (preeclampsia, gestational hypertension)	↑ Atherosclerotic CVD (including coronary heart disease, peripheral vascular disease, and ischemic stroke)	A
	↑ Hemorrhagic stroke	B
	↑ Heart failure	B
GD	↑ Atherosclerotic CVD	A
Preterm delivery	↑ Atherosclerotic CVD	A
SGA	↑ Atherosclerotic CVD	A
Large for gestational age	↑ Atherosclerotic CVD	B
Placental abruption	↑ Atherosclerotic CVD	A
Miscarriages/stillbirths	↑ Atherosclerotic CVD	A

Circulation 2021;143: e902-e916

Předčasný porod

- Porod před ukončením 37. týdne těhotenství
- 5-6% těhotenství v Evropě
  10% těhotenství v USA
- 30-35% předčasných porodů je indikováno lékařem, nejčastěji pro preeklampsii a růstovou restrikci plodu

Preterm Delivery and Maternal Cardiovascular Disease in Young and Middle-Aged Adult Women

Nurses´ Health Study II

- women who deliver their first child preterm (< 37 weeks) experience a 40% increased risk of CVD

- women with a very preterm first birth (< 32 weeks) have double the risk, after adj. for prepregnancy cardiometabolic factors

Circulation 2017;135: 578-589

European Journal of Preventive Cardiology

Review

Cardiovascular disease risk in women with a history of spontaneous preterm delivery: A systematic review and meta-analysis

Karst Y Heida[1,2], Birgitta K Velthuis[3], Martijn A Oudijk[1], Johannes B Reitsma[2], Michiel L Bots[2], Arie Franx[1], and Frederique M van Dunné[4] on behalf of the Dutch Guideline Development Group on Cardiovascular Risk Management after Reproductive Disorders

European Journal of Preventive Cardiology
2016, Vol. 23(3) 253–263
© The European Society of Cardiology 2014
Reprints and permissions:
sagepub.co.uk/journalsPermissions.nav
DOI: 10.1177/2047487314566758
ejpc.sagepub.com
SAGE

- 10 cohort studies (sample sizes 3706 – 923 686 women), FU 12-35 years
- Conclusion: **Spontaneous preterm delivery is an independent risk factor for the development of IHD, stroke and overall CVD.**

Eur J Prev Cardiol 2016;23:253-263

Hypertenze v těhotenství

- Nejčastější komplikace v těhotenství

- Výskyt ~10 % těhotenství:

  1-5 % preexistující hypertenze
  5-6 % gestační hypertenze
  1-4 % preeklampsie

Hypertenze v těhotenství je hlavní příčinou:

- mateřské
- fetální
- novorozenecké *morbidity a mortality*

Klasifikace hypertenze v těhotenství

- preexistující hypertenze
- gestační hypertenze
- preexistující hypertenze a naroubovaná gestační hypertenze s proteinurií
- hypertenze neklasifikovatelná před narozením

Preeklampsie

Gestační hypertenze provázená *významnou proteinurií*

- 300 mg/l *nebo*
- 500 mg/24 hod. *nebo*
- ++ papírkovou metodou
- albumin/kreatinin > 30 mg/mmol

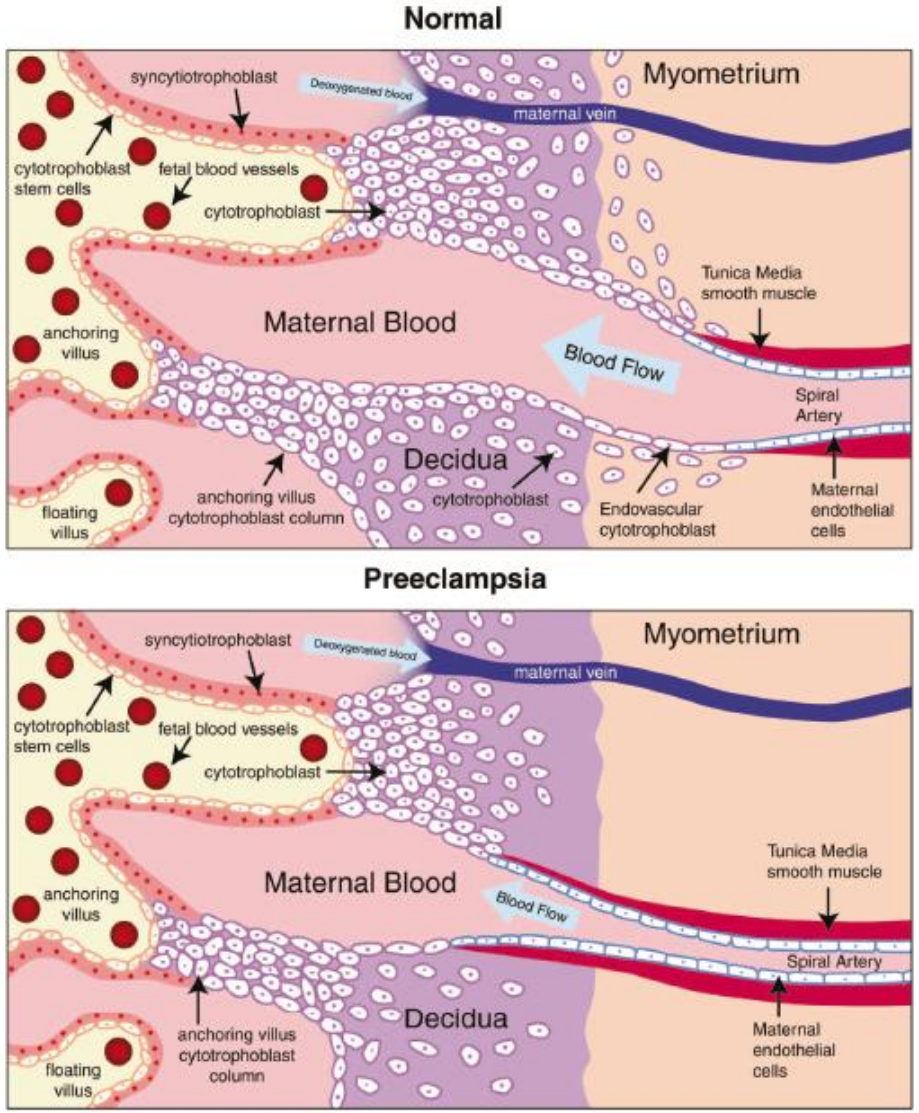
Špatné prokrvení orgánů

Definice preeklampsie podle ISSHP

Gestační hypertenze provázená proteinurií a/nebo dysfunkcí jiného orgánu matky:

- akutní poškození ledvin (kreatinin ≥ 90 μmol/l)
- poškození jater (zvýšení ALT nebo AST > 40 IU/l +/- bolest v pravém horním kvadrantu břicha nebo v epigastriu)
- neurologické komplikace (eklampsie, změna duševního stavu, oslepnutí, CMP nebo častěji hyperreflexie provázená klonickými křečemi, silnými bolestmi hlavy a přetrvávajícími scotomy)
- hematologické komplikace (trombocytopenie – počet destiček < 150 000/μl, diseminovaná intravaskulární koagulace, hemolýza)
- uteroplacentární dysfunkce (restrikce růstu plodu, abnormální Dopplerovské signály v umbilikální tepně nebo odumření plodu).

Placentation

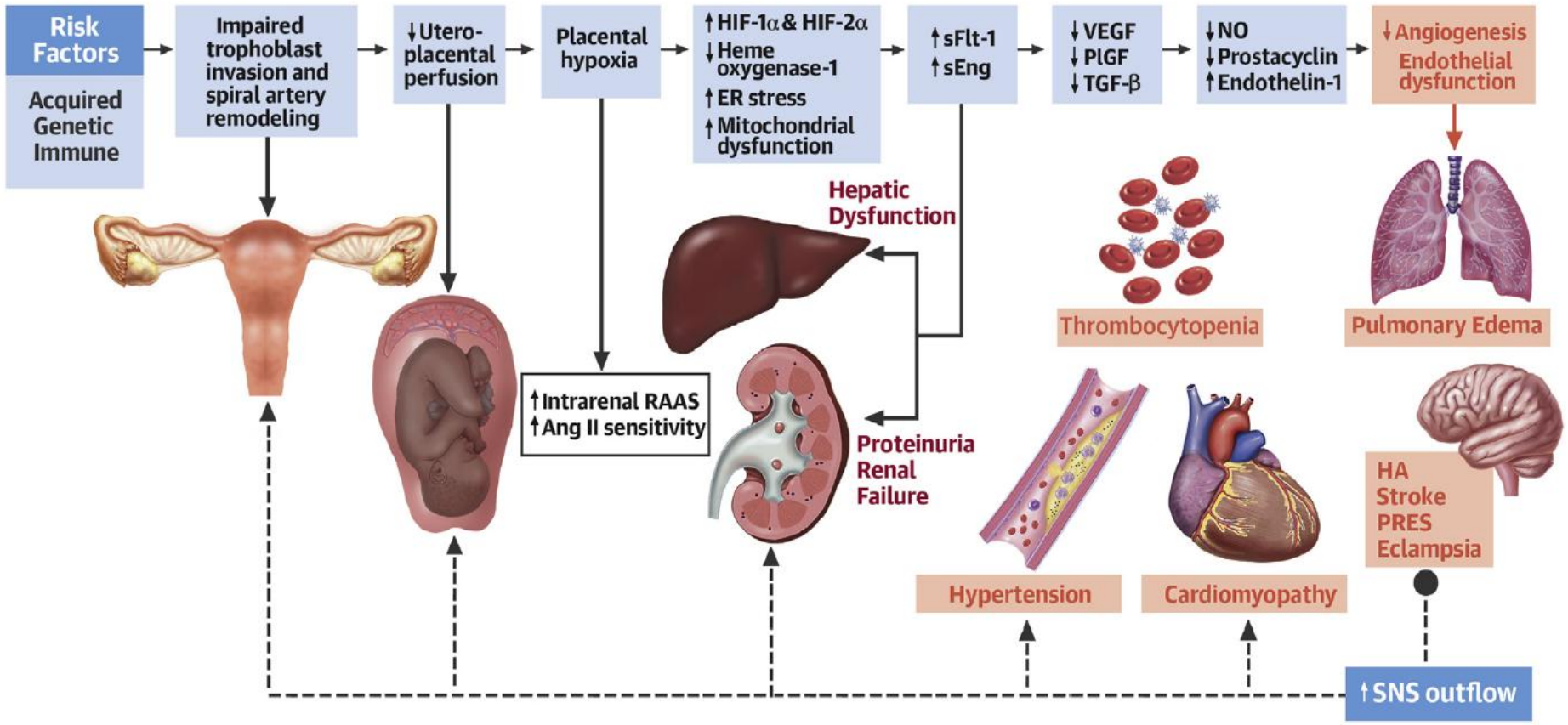


In normal placental development, invasive cytotrophoblasts of fetal origin invade the maternal spiral arteries, transforming them from small-caliber resistance vessels to high-caliber capacitance vessels capable of providing placental perfusion adequate to sustain the growing fetus.

In preeclampsia, invasion of spiral arteries is shallow, and remain small- caliber resistence vessels

Circulation 2011;123:2856 –2869

Pathogenesis of Preeclampsia



JACC 2020;76:1690-1702

Pregnancy complications

Swedish Medical Birth Register, 1992-1998

	Normotensive		*Chronic hypertension*	
	n	*per 1000*	*n*	*per 1000*
Preclampsia, total	18 573	27.4	393	116.5
Preclampsia, mild	13 060	19.3	247	73.2
Preclampsia, severe	5 555	8.2	146	43.3
Gestational diabetes	5 328	7.9	79	23.4
Abruptio placentae	3 331	4.9	38	11.3

Acta Obstet Gynecol Scand 2005;84:419-424

Antiplatelet drugs for prevention of pre-eclampsia and its consequences: systematic review

Lelia Duley, David Henderson-Smart, Marian Knight, James King

39 trials; 30 563 women

- 15% RR of pre-eclampsia
- 8% RR preterm birth
- 14% RR fetal or neonatal death

BMJ 2001;322:329-33

Prevention of Preeclampsia and Intrauterine Growth Restriction With Aspirin Started in Early Pregnancy

A Meta-Analysis

Emmanuel Bujold, MD, MSc, Stéphanie Roberge, MSc, Yves Lacasse, MD, MSc, Marc Bureau, MD, François Audibert, MD, MSc, Sylvie Marcoux, MD, PhD, Jean-Claude Forest, MD, PhD, and Yves Giguère, MD, PhD

27 studies; 11 348 women

- 53% RR of pre-eclampsia
- 56% RR IUGR

Obstet Gynecol 2010;116:402-14

2018 ESC Guidelines for the management of CVD in pregnancy

Recommendations	Class	Level
Low-dose aspirin (100–150 mg daily) is recommended in women at high or moderate risk of pre-eclampsia from week 12 to weeks 36-37.	I	A
In women with gestational hypertension or pre-existing hypertension superimposed by gestational hypertension, or with hypertension and sub-clinical organ damage or symptoms, initiation of drug treatment is recommended at SBP >140 mmHg or DBP >90 mmHg. In all other cases, initiation of drug treatment is recommended if SBP ≥150 mmHg or DBP ≥95 mmHg.	I	C
SBP ≥170 mmHg or DBP ≥110 mmHg in a pregnant woman is an emergency, and hospitalization is recommended.	I	C
Methyldopa, labetalol, and calcium antagonists are recommended for the treatment of hypertension in pregnancy.	I	B

COMMENTARY

Hypertension in Pregnancy: A Potential Window into Long-Term Cardiovascular Risk in Women

ELLEN W. SEELY*

Endocrine-Hypertension Division, Department of Medicine, Brigham and Women's Hospital and Harvard Medical School, Boston, Massachusetts 02115

Hypertensive disorders of pregnancy affect approximately 6–8% of pregnancies and are the second leading cause of maternal mortality in the United States. They are also a leading cause of maternal and neonatal morbidity (1). Despite the frequency of these disorders, their cause is unknown and their treatment is inadequate. Hypertension in pregnancy is a gender specific condition by definition. As with many other disorders that affect women, hypertension in pregnancy involves the overlap of the fields of internal medicine and obstetrics. Whereas most essential hypertension is managed by internists, when a pregnant woman is hypertensive, the care of the hypertension is managed primarily by obstetricians. This leads to an interesting potential duality in the focus and approach of each specialty. In general, hypertension in pregnancy has been viewed as an obstetrical disorder and has not been an area of investigation for most internists. For the obstetrician, the disorder is one of pregnancy itself, and the focus is on the outcome of the individual pregnancy. On the other hand, for the internist an emerging focus is on the potential implications of hypertension and resolving postpartum. Preeclampsia differs from tional hypertension due to its multisystem involvement as proteinuria as described below. When a women preexisting hypertension develops an exacerbation c hypertension during pregnancy accompanied by protei or other systemic signs, this is termed hypertension superimposed preeclampsia.

Diagnosis and clinical course

When a woman presents with hypertension in pregn the first step is to establish whether it is of new onset preexisting. With more women delaying child bearing later ages, pregnancies are occurring more frequently age when women have already developed essential h tension. Essential hypertension carries with it an exc prognosis in pregnancy unless superimposed preeclar develops. Two major areas of difference in manage between hypertension during pregnancy *vs.* hyperte outside of pregnancy are in the choice of antihyperte and the goal of treatment.

J Clin Endocrinology Metabol 1999;84:1858-1861

- U žen, které mají gestační hypertenzi bez proteinurie, je vyšší pravděpodobnost rozvoje chronické hypertenze v pozdější fázi života než u žen, které mají hypertenzi a významnou proteinurii v těhotenství

- Ženy, u kterých je *TK normální po všechna těhotenství, mají menší pravděpodobnost rozvoje hypertenze v pozdější fázi života* než ženy z běžné populace.

N Engl J Med 2001;344:925-6

Pre-eclampsia and risk of cardiovascular disease and cancer in later life: systematic review and meta-analysis

Leanne Bellamy, medical student,[1] Juan-Pablo Casas, clinical lecturer,[2] Aroon D Hingorani, reader,[3] David J Williams, consultant obstetric physician[4]

[1]Imperial College School of Medicine, London

[2]Department of Epidemiology and Population Health, London School of Hygiene and Tropical Medicine

[3]British Heart Foundation Laboratories, Department of Medicine, University College London

[4]Institute for Women's Health, Elizabeth Garrett Anderson Obstetric Hospital, University College London, London WC1E 6DH

Correspondence to: D J Williams
d.williams@ucth.nhs.uk

doi:10.1136/bmj.39335.385301.BE

ABSTRACT

Objective To quantify the risk of future cardiovascular diseases, cancer, and mortality after pre-eclampsia.

Design Systematic review and meta-analysis.

Data sources Embase and Medline without language restrictions, including papers published between 1960 and December 2006, and hand searching of reference lists of relevant articles and reviews for additional reports.

Review methods Prospective and retrospective cohort studies were included, providing a dataset of 3 488 160 women, with 198 252 affected by pre-eclampsia (exposure group) and 29 495 episodes of cardiovascular disease and cancer (study outcomes).

Results After pre-eclampsia women have an increased risk of vascular disease. The relative risks (95% confidence intervals) for hypertension were 3.70 (2.70 to 5.05) after 14.1 years weighted mean follow-up, for ischaemic heart disease 2.16 (1.86 to 2.52) after 11.7 years, for stroke 1.81 (1.45 to 2.27) after 10.4 years, and for venous thromboembolism 1.79 (1.37 to 2.33) after 4.7 years. No increase in risk of any cancer was found (0.96, 0.73 to 1.27), including breast cancer (1.04, 0.78 to 1.39) 17 years after pre-eclampsia. Overall mortality after pre-eclampsia was increased: 1.49 (1.05 to 2.14) after 14.5 years.

Conclusions A history of pre-eclampsia should be considered when evaluating risk of cardiovascular

and some are also features of the "metabolic syndrome" a "risk factor" for cardiovascular disease.[10] It is possible that pre-eclampsia increases risk of later cardiovascular disease,[11] either because of a shared cause or because subclinical vascular damage occurs during pre-eclampsia.

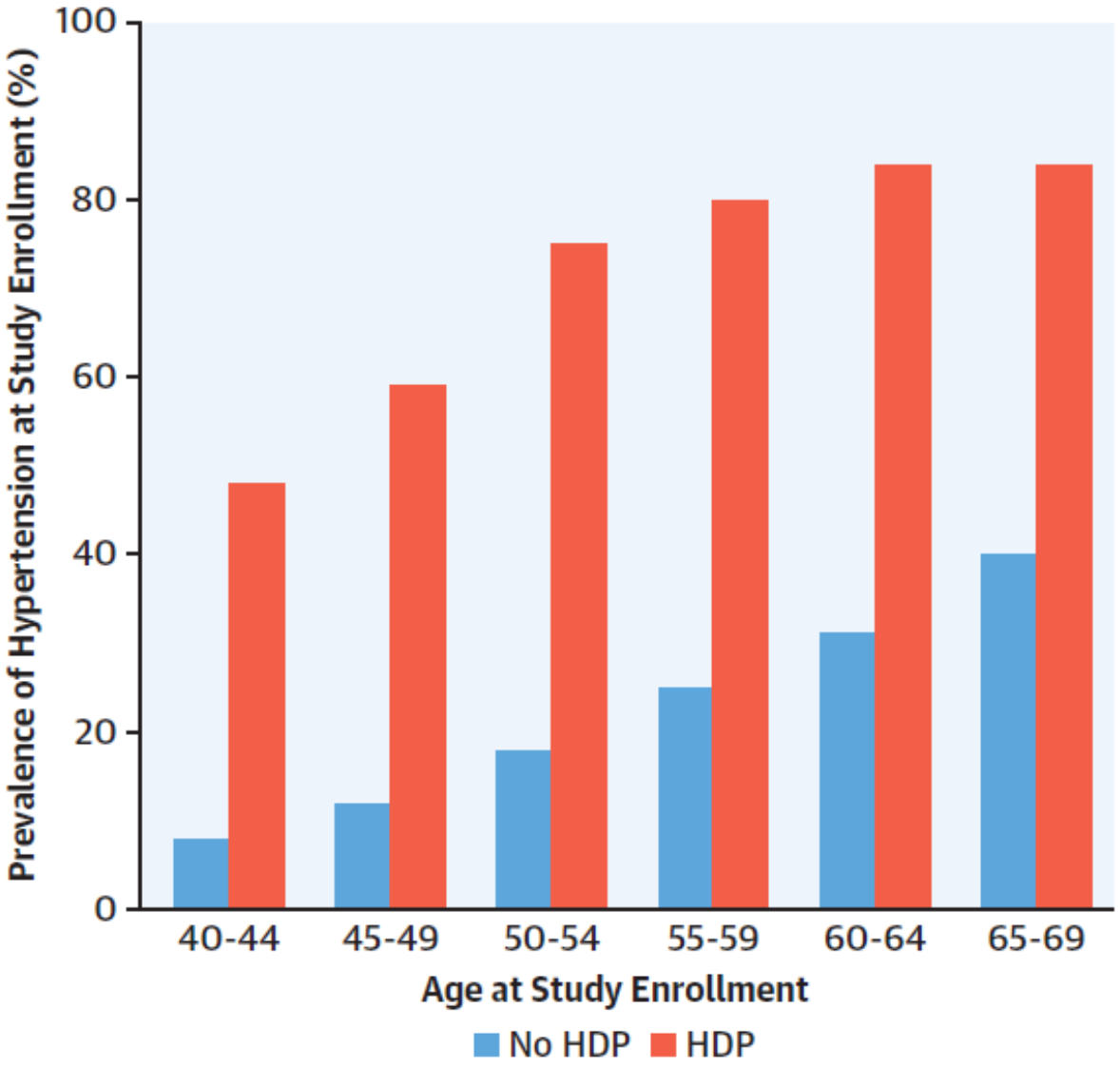
If a history of pre-eclampsia exerts an independent risk for future cardiovascular disease it may increase the risk of cardiovascular disease in mid-life in affected women, which would render them eligible for preventive therapies at an earlier age than usual. To investigate the association between pre-eclampsia and atherosclerosis in later life we carried out a systematic review and meta-analysis of studies that had estimated the risk of arterial and venous diseases after pre-eclampsia. We also evaluated the risk of future cancer after pre-eclampsia, in particular breast cancer, one of the commonest causes of death in middle aged women.[13,14] Finally we investigated mortality from any cause after a pregnancy affected by pre-eclampsia.

METHODS

We searched Medline and Embase with no language restrictions up to December 2006. Additional eligible studies were sought by a hand search of reference lists from primary articles and relevant reviews. (See bmj.com for search terms and combinations).

Prevalence hypertenze u žen s hypertenzí v těhotenství

UK Biobank



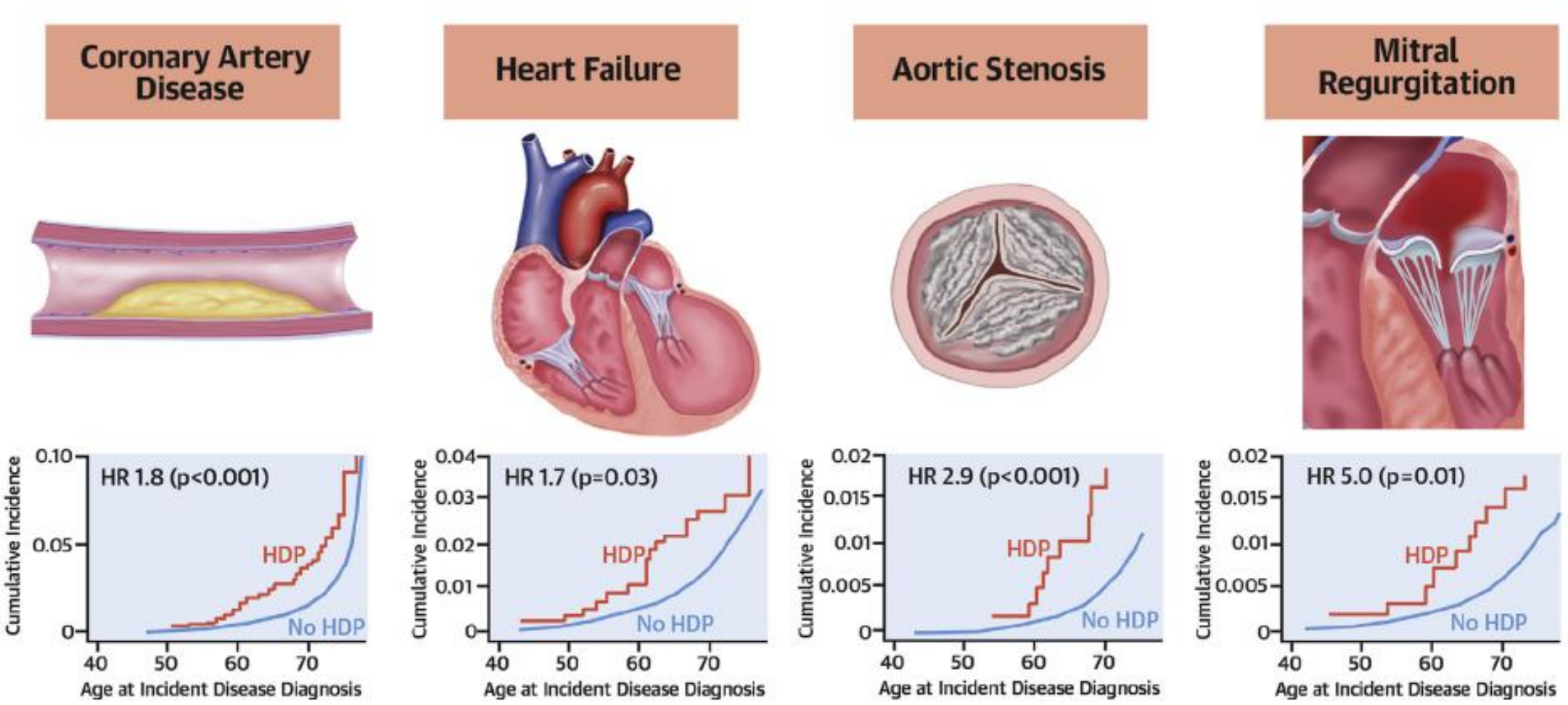
- 220 024 žen
- 40-69 let
- ≥ 1 živě narozeného dítěte

- 2 808 žen s HT v těhotenství

JACC 2019;74:2743-54

Hypertenze v těhotenství a dlouhodobé riziko KVO

UK Biobank



JACC 2019;74:2743-54

Circulation

RESEARCH LETTER

Prevalence of Subclinical Coronary Artery Disease Assessed by Coronary Computed Tomography Angiography in 45- to 55-Year-Old Women With a History of Preeclampsia

Gerbrand A. Zoet, MD, PhD
Laura Benschop, MD

Preeclampsia is associated with an increased risk of coronary artery disease (CAD), although evidence on premature CAD development after preeclampsia is limited.[1] A cross-sectional study among 491 postmeno-

- 164 asymptomatic women with a history of preeclampsia
- 31% CACS > 0

Circulation 2018;137:877-879

OPEN ACCESS

Check for updates

Pre-eclampsia and risk of dementia later in life: nationwide cohort study

Saima Basit, Jan Wohlfahrt, Heather A Boyd

- *Design:* Nationwide register based cohort study
- *Setting:* Denmark, 1978 - 2015
- *Population:* 1 178 005 women with at least 1 pregnancy lasting 20 weeks or longer
- *Results:* Women with a history of pre-eclampsia had increased risk for vascular dementia
  HR 3.46 (CI 1.97-6.10), stronger association for late onset disease

BMJ 2018;363:k4109

AHA Guideline

Effectiveness-Based Guidelines for the Prevention of Cardiovascular Disease in Women—2011 Update

A Guideline From the American Heart Association

EXECUTIVE WRITING COMMITTEE

Lori Mosca, MD, MPH, PhD, FAHA, Chair; Emelia J. Benjamin, MD, ScM, FAHA; Kathy Berra, MSN, NP; Judy L. Bezanson, DSN, CNS, RN; Rowena J. Dolor, MD, MHS; Donald M. Lloyd-Jones, MD, ScM; L. Kristin Newby, MD, MHS; Ileana L. Piña, MD, MPH, FAHA; Véronique L. Roger, MD, MPH; Leslee J. Shaw, PhD; Dong Zhao, MD, PhD

- Pregnancy provides a unique opportunity to estimate a woman´s lifetime risk

- Preeclampsia may be an early indicator of CVD risk

Circulation 2011;123:DOI:10.1161/CIR.0b013e31820faaf8

European Heart Journal (2016) **37**, 2315–2381
doi:10.1093/eurheartj/ehw106

2016 European Guidelines on cardiovascular disease prevention in clinical practice

The Sixth Joint Task Force of the European Society of Cardiology and Other Societies on Cardiovascular Disease Prevention in Clinical Practice (constituted by representatives of 10 societies and by invited experts)

Developed with the special contribution of the European Association for Cardiovascular Prevention & Rehabilitation (EACPR)

Authors/Task Force Members: Massimo F. Piepoli* (Chairperson) (Italy), Arno W. Hoes* (Co-Chairperson) (The Netherlands), Stefan Agewall (Norway)[1], Christian Albus (Germany)[9], Carlos Brotons (Spain)[10], Alberico L. Catapano (Italy)[3], Marie-Therese Cooney (Ireland)[1], Ugo Corrà (Italy)[1], Bernard Cosyns (Belgium)[1], Christi Deaton (UK)[1], Ian Graham (Ireland)[1], Michael Stephen Hall (UK)[7], F. D. Richard Hobbs (UK)[10], Maja-Lisa Løchen (Norway)[1], Herbert Löllgen (Germany)[8], Pedro Marques-Vidal (Switzerland)[1], Joep Perk (Sweden)[1], Eva Prescott (Denmark)[1], Josep Redon (Spain)[5], Dimitrios J. Richter (Greece)[1], Naveed Sattar (UK)[2], Yvo Smulders (The Netherlands)[1], Monica Tiberi (Italy)[1], H. Bart van der Worp (The Netherlands)[6], Ineke van Dis (The Netherlands)[4], W. M. Monique Verschuren (The Netherlands)[1]

Additional Contributor: Simone Binno (Italy)

Female-specific conditions

- In women with a history of pre-eclampsia or pregnancy-induced hypertension, periodic screening for hypertension and diabetes should be considered,
- In women with a history of polycystic ovary syndrome or gestational diabetes, periodic screening for DM should be considered,
- In women with a history of giving premature birth, periodic screening for hypertension and DM may be considered

European Journal of Preventive Cardiology

Review

Cardiovascular risk management after reproductive and pregnancy-related disorders: A Dutch multidisciplinary evidence-based guideline

Karst Y Heida[1,2], Michiel L Bots[2], Christianne JM de Groot[3], Frederique M van Dunné[4], Nurah M Hammoud[1], Annemiek Hoek[5], Joop SE Laven[6], Angela HEM Maas[7], Jeanine E Roeters van Lennep[8], Birgitta K Velthuis[9] and Arie Franx[1]

European Journal of Preventive Cardiology
2016, Vol. 23(17) 1863–1879
© The European Society of Cardiology 2016
Reprints and permissions:
sagepub.co.uk/journalsPermissions.nav
DOI: 10.1177/2047487316659573
ejpc.sagepub.com
SAGE

Downloaded

Cardiovascular risk management after reproductive and pregnancy-related disorders: A Dutch multidisciplinary evidence-based guideline

Conclusions: Based on the current available evidence, follow-up is only recommended for women with a history of preeclampsia. For all reproductive and pregnancy-related disorders optimisation of modifiable cardiovascular risk factors is recommended to reduce the risk of future CVD.

Eur J Prev Cardiol 2016;23:1863-1879

Original Research

Duration of Lactation and Risk Factors for Maternal Cardiovascular Disease

Eleanor Bimla Schwarz, MD, MS, Roberta M. Ray, MS, Alison M. Stuebe, MD, MSc, Matthew A. Allison, MD, MPH, Roberta B. Ness, MD, MPH, Matthew S. Freiberg, MD, MSc, and Jane A. Cauley, DrPH

OBJECTIVE: To examine dose–response relationships between the cumulative number of months women lactated and postmenopausal risk factors for cardiovascular disease.

more than 12 months of lactation were less likely to have hypertension (odds ratio [OR] 0.88, $P<.001$), diabetes (OR 0.80, $P<.001$), hyperlipidemia (OR 0.81, $P<.001$), or cardiovascular disease (OR 0.91, $P=.008$) than women who never

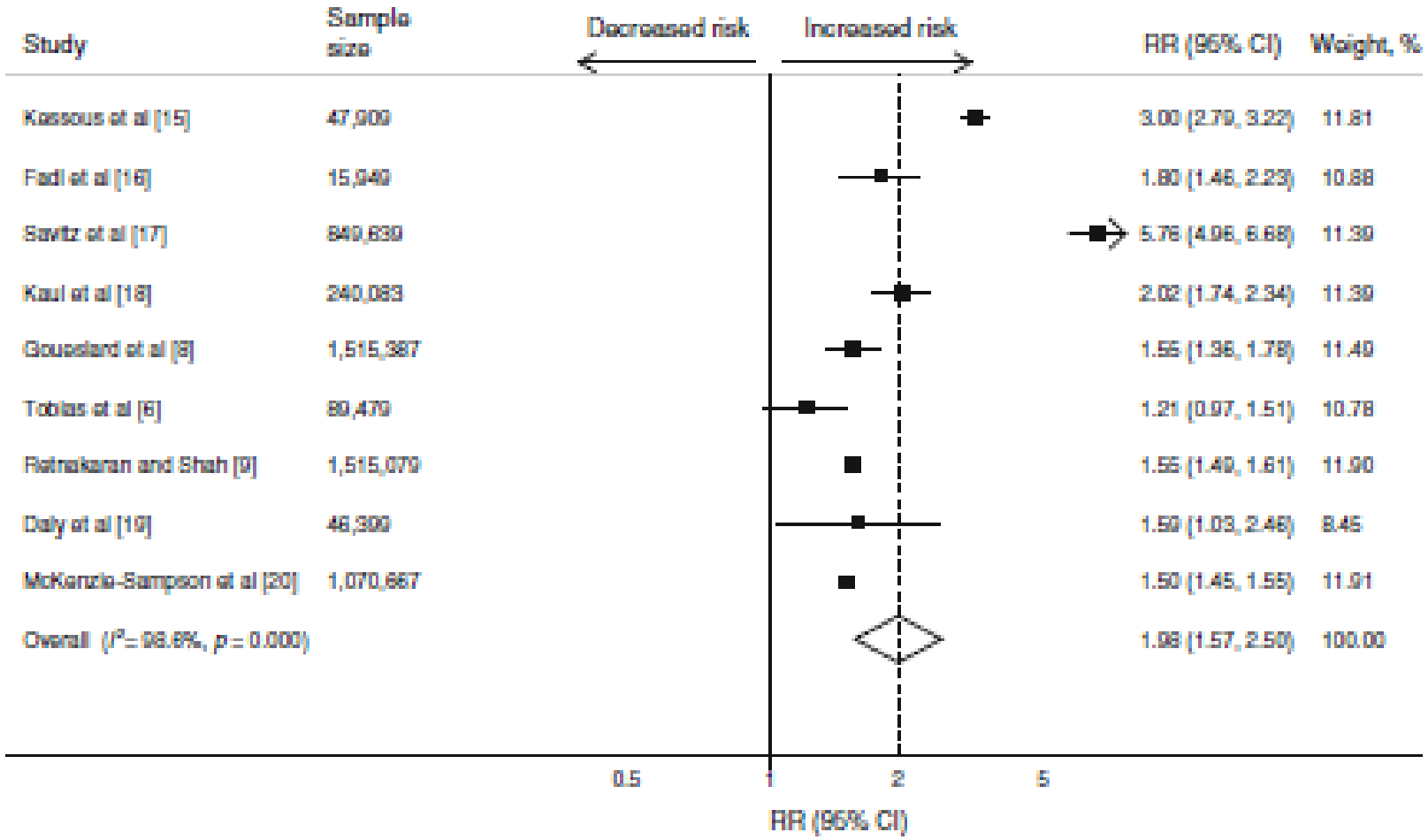
- 139 681 postmenopausal women with at least 1 live birth
- Conclusion: Among postmenopausal women, increased duration of lactation was associated with a lower prevalence of hypertension, diabetes, hyperlipidemia, and cardiovascular disease.

Obstet Gynecol 2009;113:974-82

Gestational diabetes mellitus

- First development of glucose intolerance during pregnancy
- 7% of pregnancies
- 10% will have DM soon after delivery, 20% impaired glucose metabolism; oGTT 4-12 weeks post-partum
- 20-60% will develope type2 DM later in life

Gestational DM and the risk of CV events



Diabetologia 2019; 62: 905-14

Závěry

- Ženy, které otěhotněly pomocí metod asistované reprodukce, mají vyšší riziko rozvoje hypertenze v těhotenství.
- Metody asistované reprodukce navozují předčasné stárnutí cév, které přetrvává u adolescentů bez přítomnosti klasických rizikových faktorů KVO.
- Opakované samovolné potraty jsou spojeny s vyšším rizikem ICHS.

Závěry

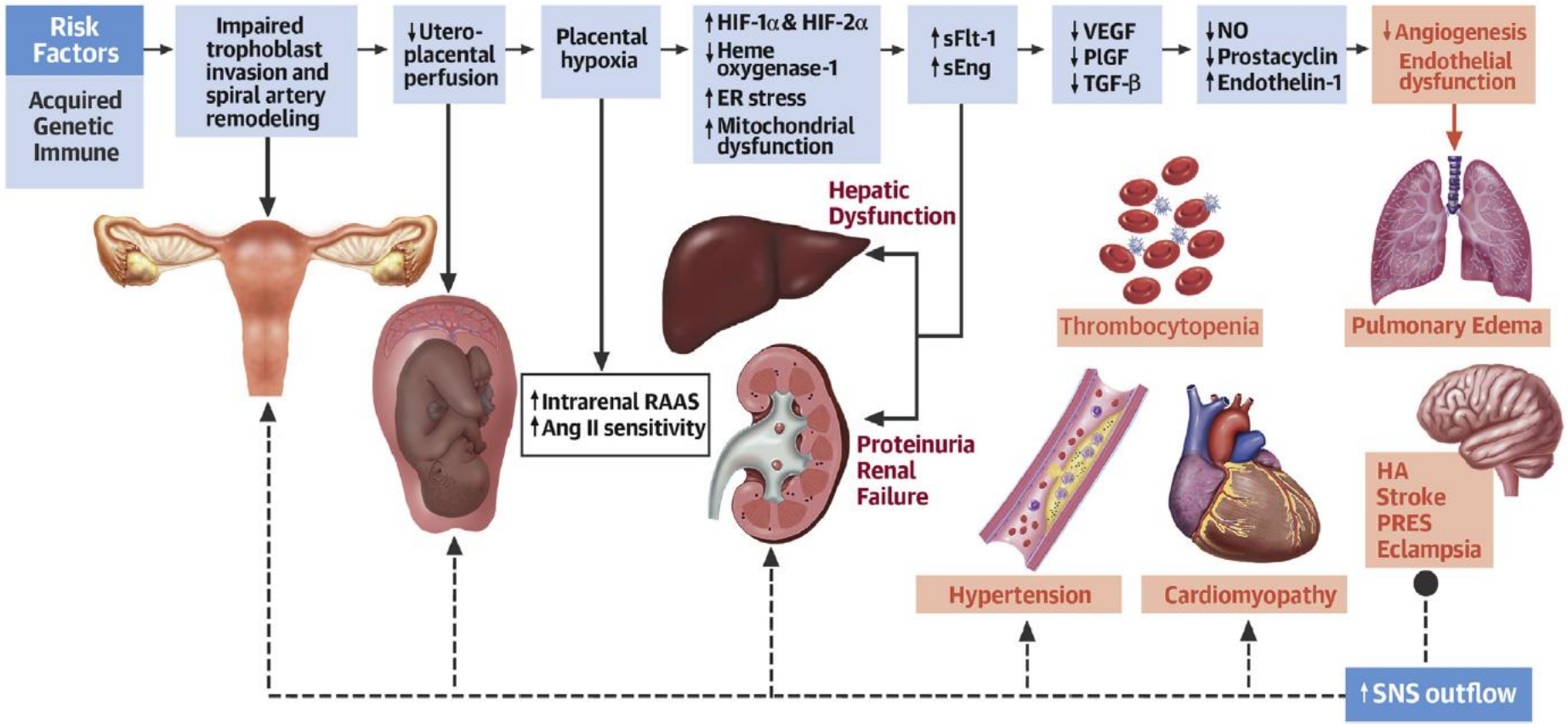
- Ženy s hypertenzí v těhotenství, zvláště s pre-eklampsií/HELLP sy mají vyšší riziko rozvoje hypertenze a KVO v pozdější fázi života.

- Údaje o těhotenství, průběhu a komplikacích (hypertenze, pre-eklampsie, samovolný potrat, předčasný porod, small-for-gestational-age baby, gestační diabetes) musí být součástí anamnézy a stanovení KV rizika.

- Pravidelné kontroly TK je třeba provádět min. v prvních měsících po porodu, vhodný je self-monitoring a zapojení eHealth technologií.

- Ženy s pre-eklampsií v anamnéze mají vysoké KV riziko a měly by být pravidelně sledovány. Pro všechny ženy s hypertenzí v těhotenství je vhodná optimalizace RF KVO.

Patogeneze hypertenze



JACC 2020;76:1690-1702