Management of Preeclampsia and Eclampsia

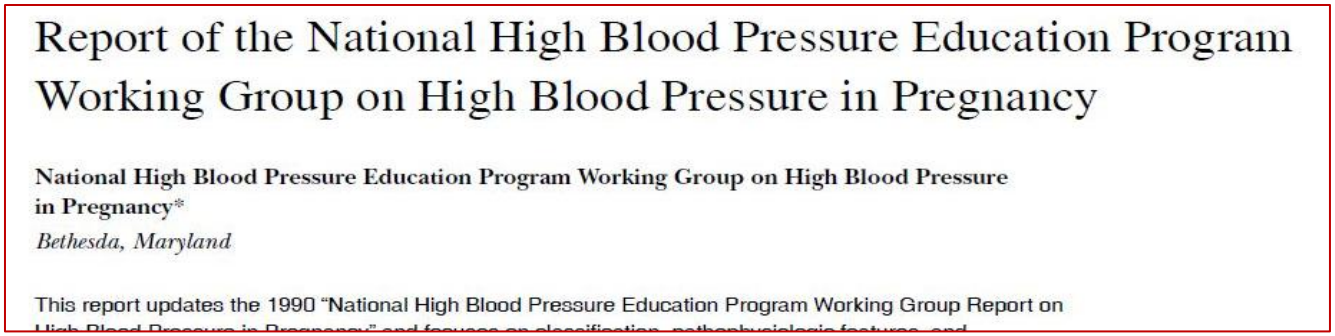
Igor Michalec

Hypertension in pregnancy

- **5 – 10 % all pregnant**

- **severe impacts on the health of mothers and fetuses**

- **among the 3 most common causes of death in pregnancy**



Report of the National High Blood Pressure Education Program Working Group on High Blood Pressure in Pregnancy

National High Blood Pressure Education Program Working Group on High Blood Pressure in Pregnancy*

Bethesda, Maryland

This report updates the 1990 "National High Blood Pressure Education Program Working Group Report on

Classification of hypertension in pregnancy

Chronic hypertension

- Před těhotenstvím, event. prvně zjištěná v graviditě a přetrvává
  > 6 týdnů po porodu
- Esenciální nebo sekundární

Gestational hypertension

- Ve 2. polovině gravidity, vymizí nejpozději do 12 týdnů
- Nevymizí-li = chronická

Preeklampsia - eklampsia

- Hypertenze a proteinurie ve 2. polovině gravidity
- Eklampsie – encefalopatie, tonicko-klonické křeče, porucha vědomí, amnézie
- HELLP syndrom

Preeclampsia superimposed

- Preeklampsie u chronické hypertenze
- Hypertenze před graviditou, proteinurie v 2. polovině gravidity

Chronic Hypertension vs. preeclampsia

CHRONIC HYPERTENSION

Esencial

Secondary

nephrogenic, endocrine, cardiac, central

Assessment of organ disability in the introduction

ventricular hypertrophy, retinopathy, renal function

Risk of pre-eclampsia up to 25%

Chronic Hypertension vs. preeclampsia

CHRONIC HYPERTENSION

Esencial

Secondary

nephrogenic, endocrine, cardiac, central

Assessment of organ disability in the introduction

ventricular hypertrophy, retinopathy, renal function

Risk of pre-eclampsia up to 25%

PREEKLAMPSIA

Systemic disease

Decreased organ perfusion

Damage to kidney, placenta, liver, brain and other organs

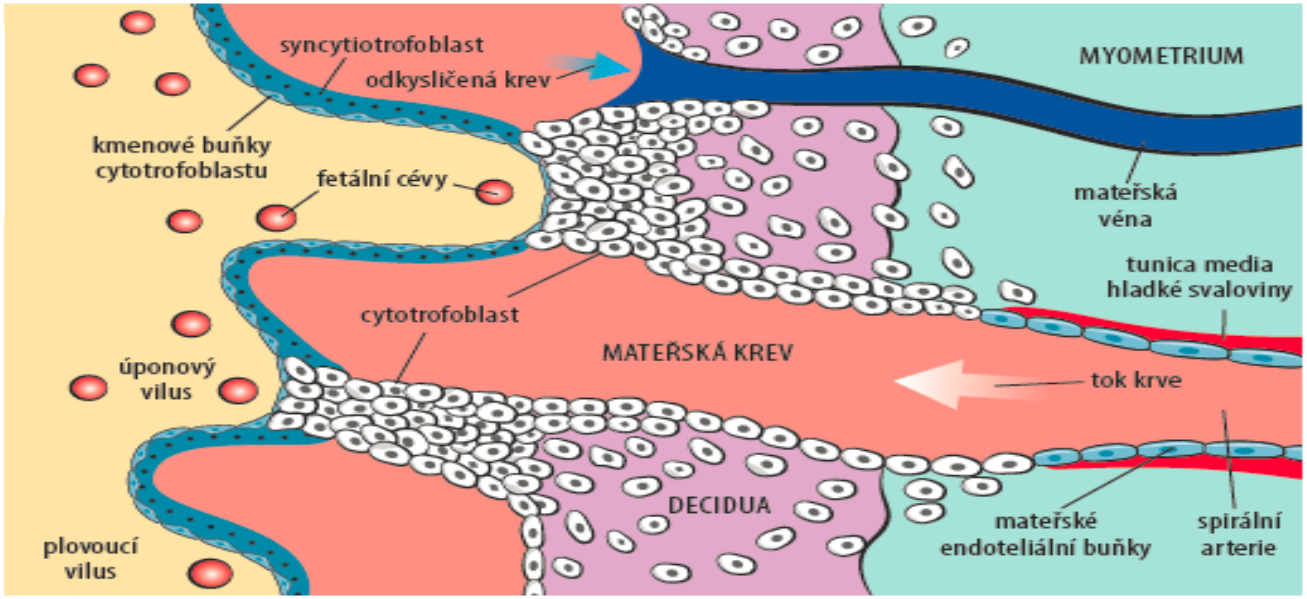
Etiology - multifactorial

Disorders of trophoblast invasion

Endothelium activation

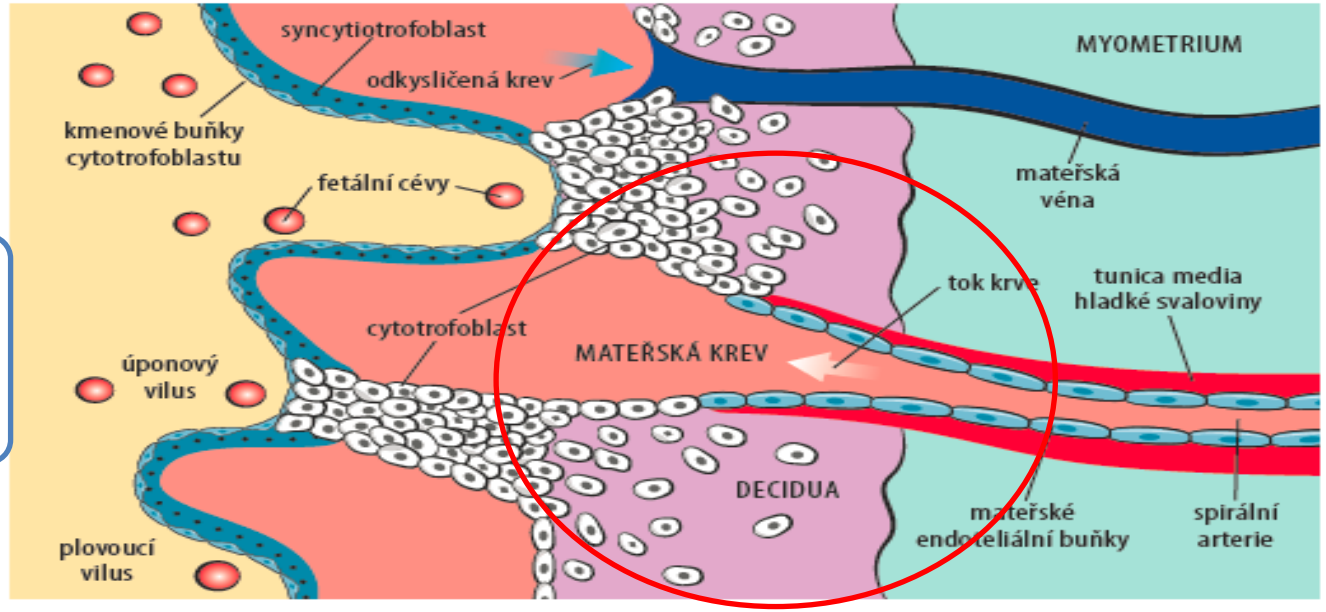
INVASION OF TROFOBLAST

Normal situation

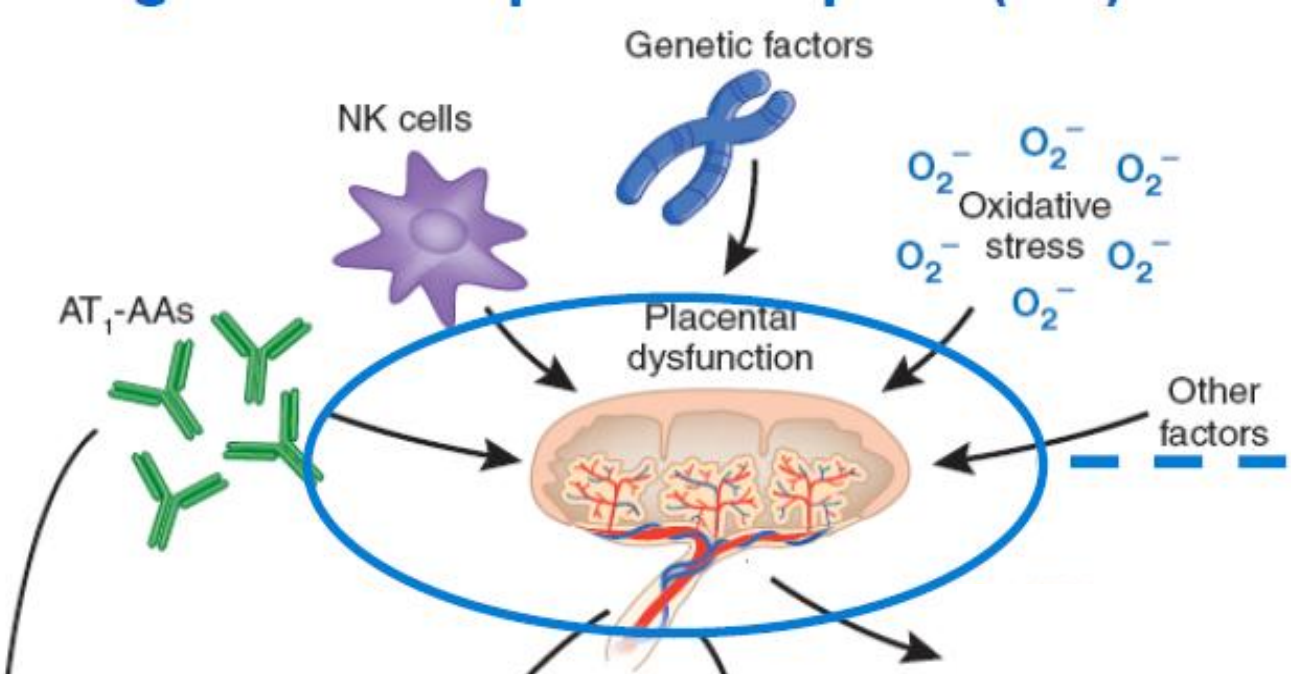


Obr. 4.2a Fyziologická placentace

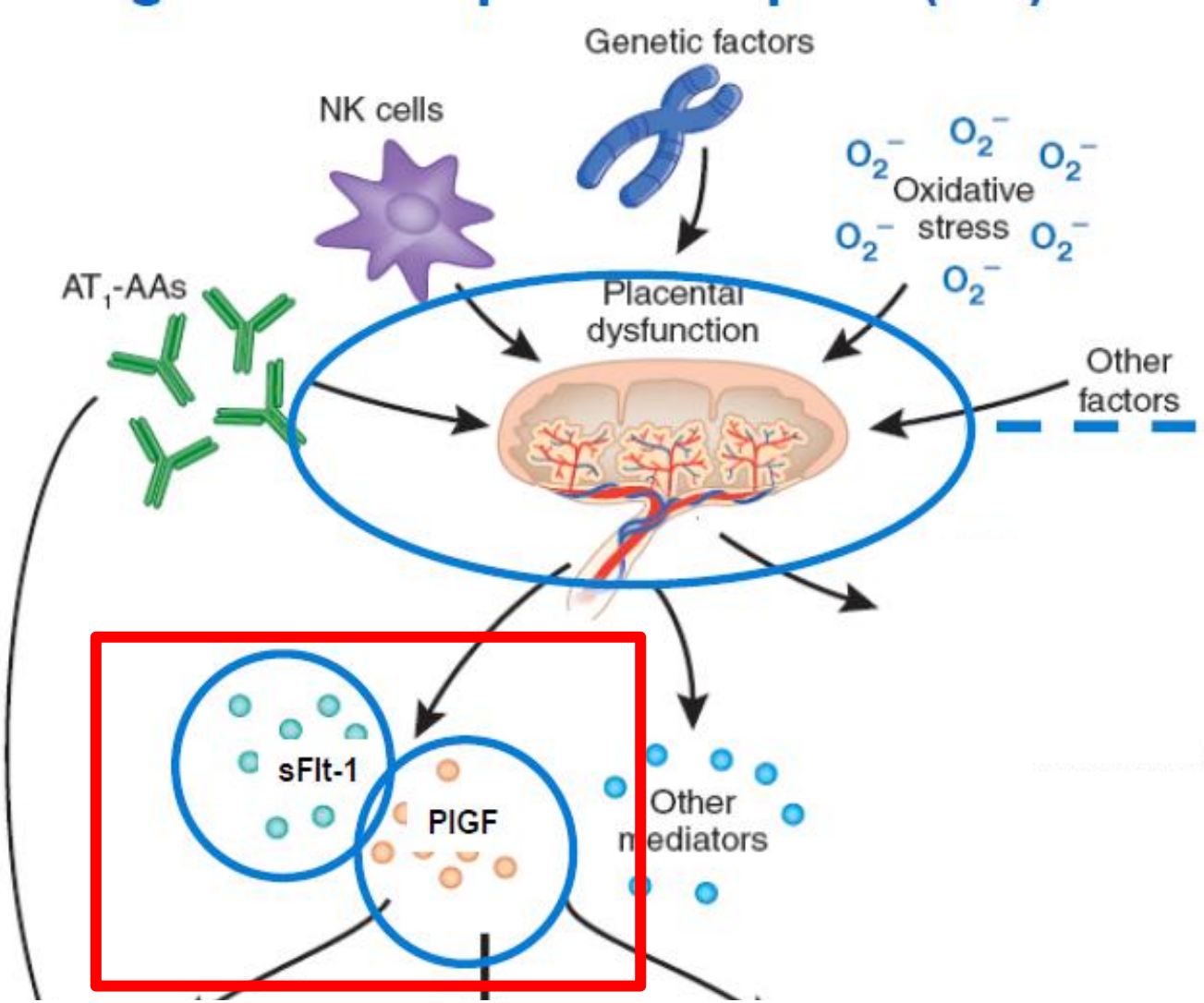
Preeklampsia



Obr. 4.2b Abnormální placentace u preeklampsie

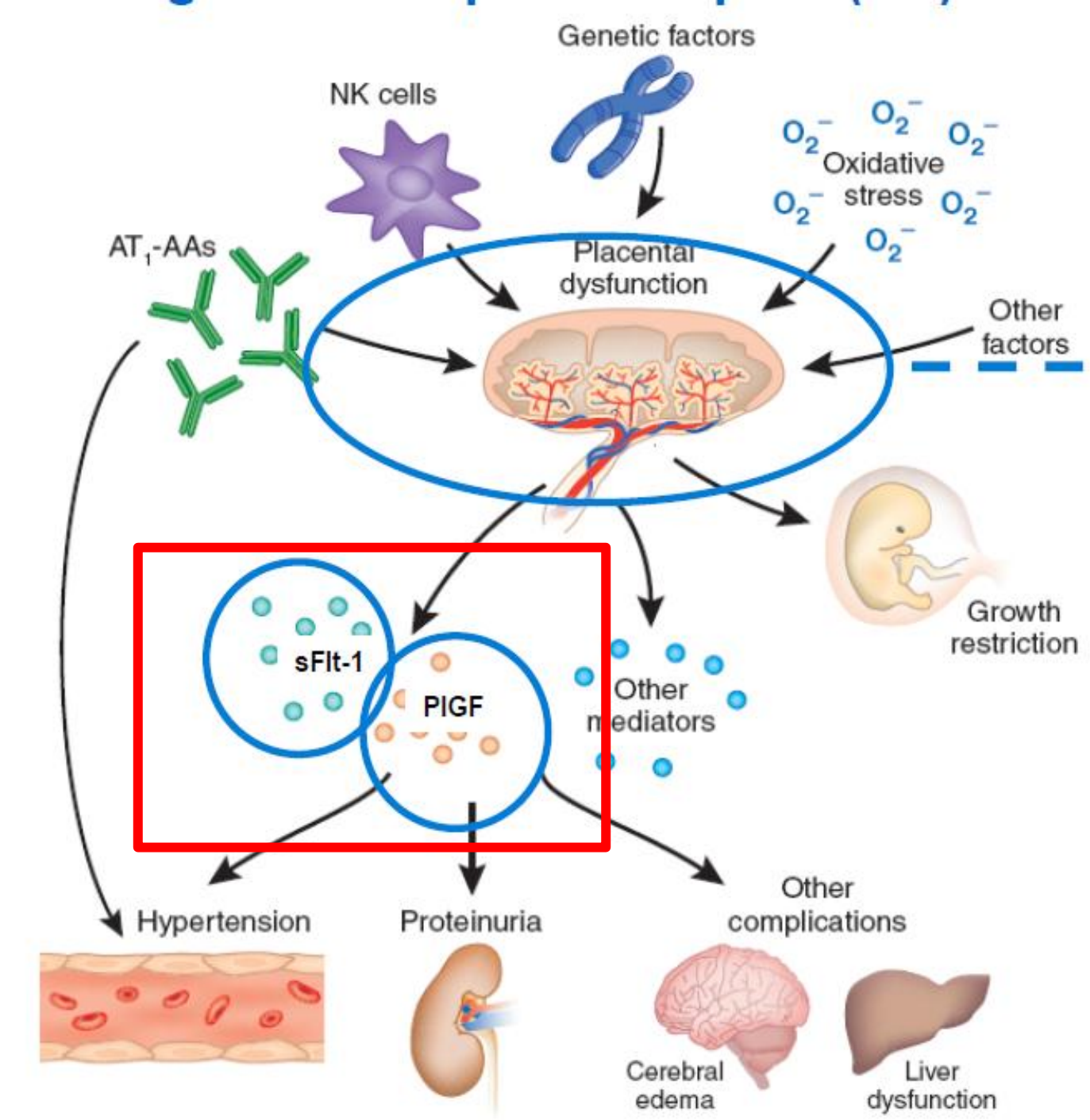


The first half of pregnancy placental disorder



The first half of pregnancy placental disorder

Endothelial dysfunction
Antiangiogenic factors



The first half of pregnancy
placental disorder

Endothelial dysfunction
Antiangiogenic factors

The second half of pregnancy

- generalized disorder
-plamlampsia / eclampsia / HELLP
- Growth restriction of the fetus

Premature delivery
Abrupce of the placenta
Intrauterine death

Preeklampsia

4 - 8% of the pregnant population
9 - 26% of maternal deaths
15% of premature births

hypertension + proteinuria + edema

Early / Late
The most serious complications
Eclampsia
HELLP

Current best practice in the management of hypertensive disorders in pregnancy.

Townsend R[1], O'Brien P[2], Khalil A[1].

⊕ **Author information**

Abstract

Preeclampsia is a potentially serious complication of pregnancy with increasing significance worldwide. Preeclampsia is the cause of 9%-26% of global maternal mortality and a significant proportion of preterm delivery, and maternal and neonatal morbidity. Incidence is increasing in keeping with the increase in obesity, maternal age, and women with medical comorbidities entering pregnancy. Recent

Diagnostics and monitoring

HYPERTENZE

140/90 - WHO 1993

severe HT> 160/110

heavy HT> 180

PROTEINURIE

PCR - 30 mg / mmol - negative predictive value

> 300 mg / day - 24 hour collection

Diagnostics and monitoring

LABORATORY EXAMINATION

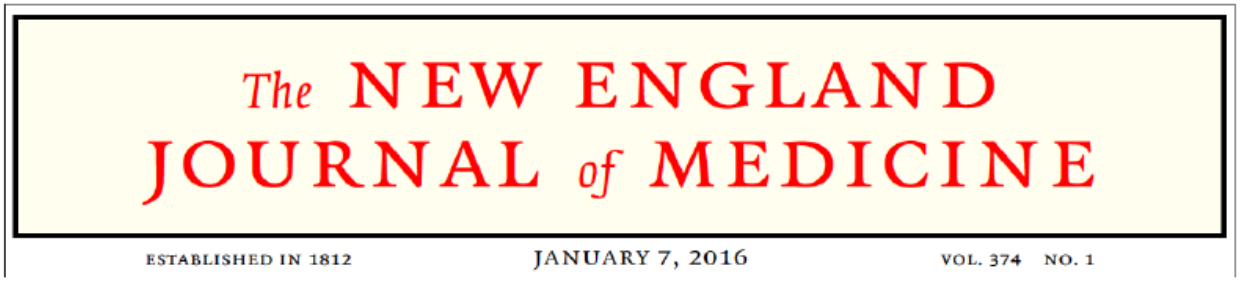
BC, coagulation, urinary urea, urea, creatinine, albumin, LDH, (bilirubin, haptoglobin), diuresis

MONITORING FETUS STATUS

Diagnostics and monitoring

NEW SCREENING TEST

- **The PROGNOSIS study**
- **sFlt-1/PLGF ratio**



The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 JANUARY 7, 2016 VOL. 374 NO. 1

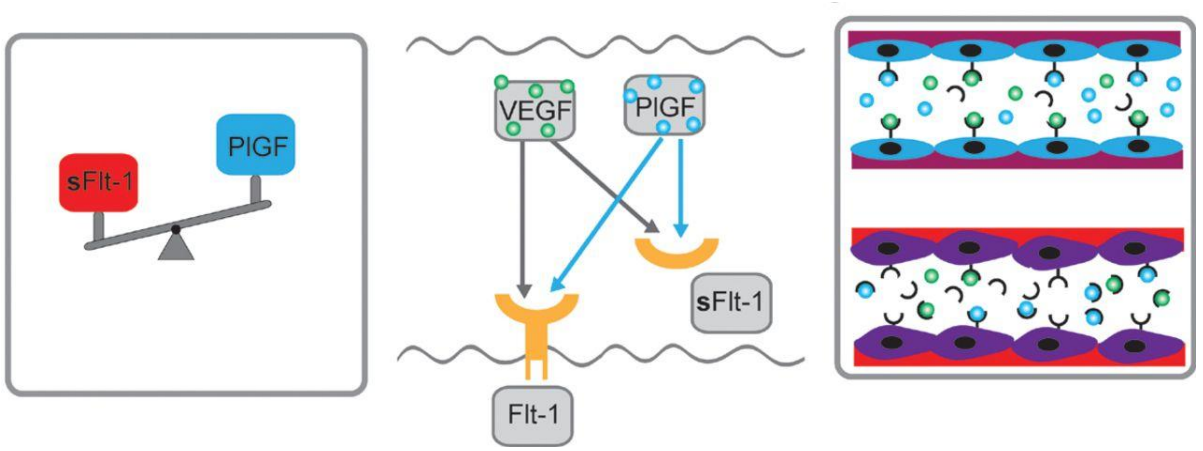
Predictive Value of the sFlt-1:PlGF Ratio in Women with Suspected Preeclampsia

Harald Zeisler, M.D., Elisa Llurba, M.D., Ph.D., Frederic Chantraine, M.D., Ph.D., Manu Vatish, M.B., Ch.B., D.Phil., Anne Cathrine Staff, M.D., Ph.D., Maria Sennström, M.D., Ph.D., Matts Olovsson, M.D., Ph.D., Shaun P. Brennecke, M.B., B.S., D.Phil., Holger Stepan, M.D., Deirdre Allegranza, B.A., Peter Dilba, M.Sc., Maria Schoedl, Ph.D., Martin Hund, Ph.D., and Stefan Verlohren, M.D., Ph.D.

sFlt-1 / PlGF

sFlt-1 is the dominant anti-angiogenic factor
Its serum levels increase significantly several weeks before clinical manifestation of preeclampsia.

In contrast, PlGF is an important proangiogenic factor.
Its serum levels are significantly reduced already in early stages of pregnancy in patients with subsequent clinical manifestation of preeclampsia.



Diagnostics and monitoring

sFlt-1/PLGF < 38

Rule out PE within 1 week % (95% CI)	
NPV	99.3 (97.9–99.9)
Sens.	80.0 (51.9–95.7)
Spec.	78.3 (74.6–81.7)

sFlt-1/PLGF > 38

Rule in PE within 4 weeks % (95% CI)	
PPV	36.7 (28.4–45.7)
Sens.	66.2 (54.0–77.0)
Spec.	83.1 (79.4–86.3)

HELLP syndrom

Low incidence (<0.5%)

Non-specific symptoms

cefalea

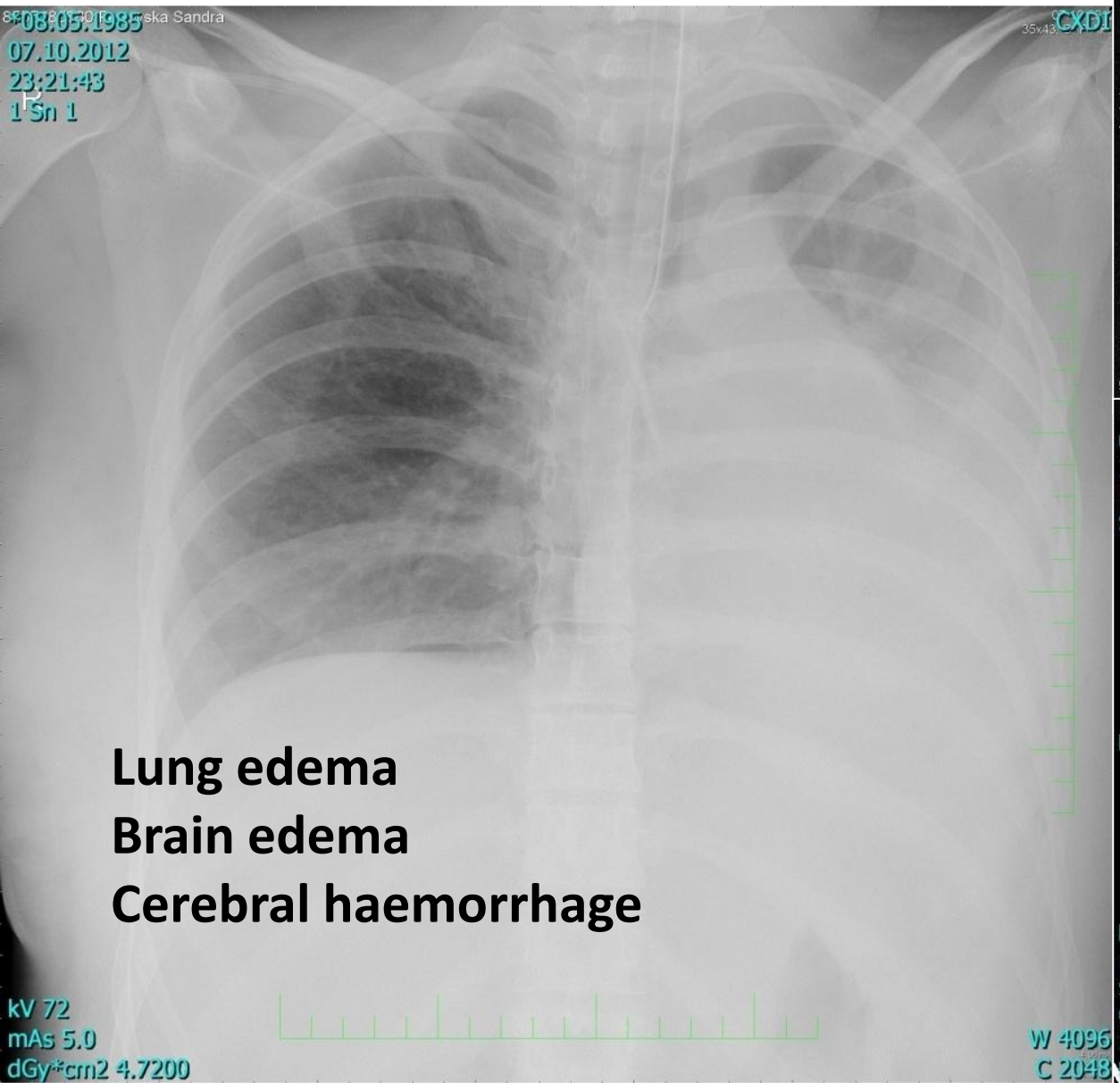
visa disorders

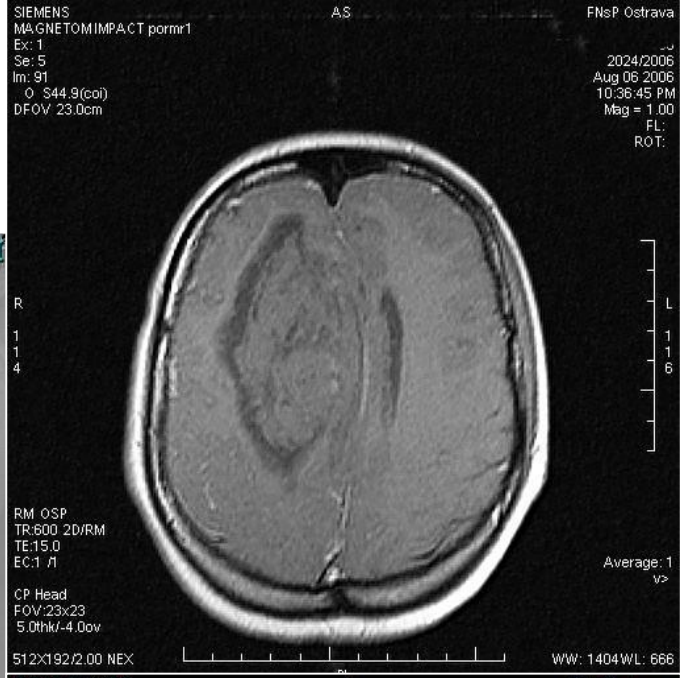
epigastric pain

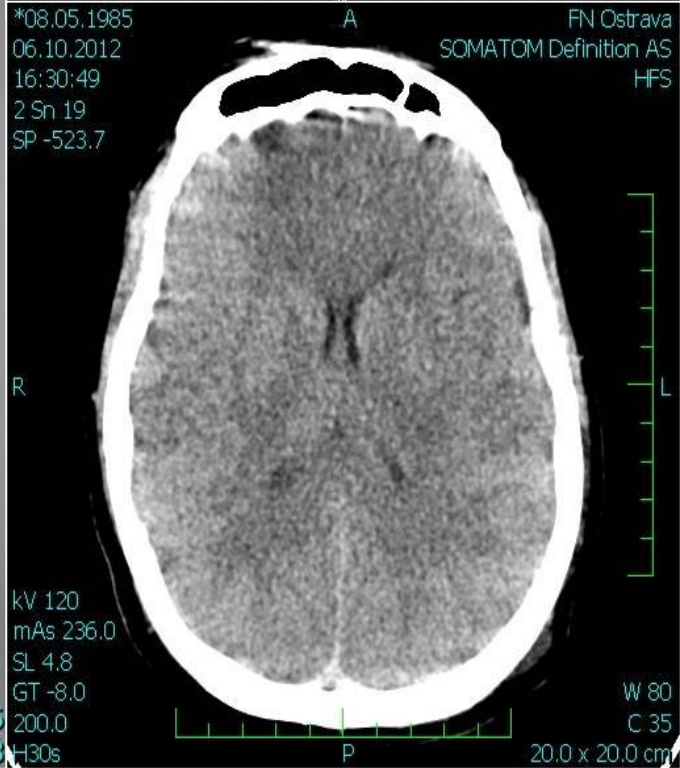
(Extremely) fast progress

Possible death of the mother despite adequate therapy

Clinical manifestations

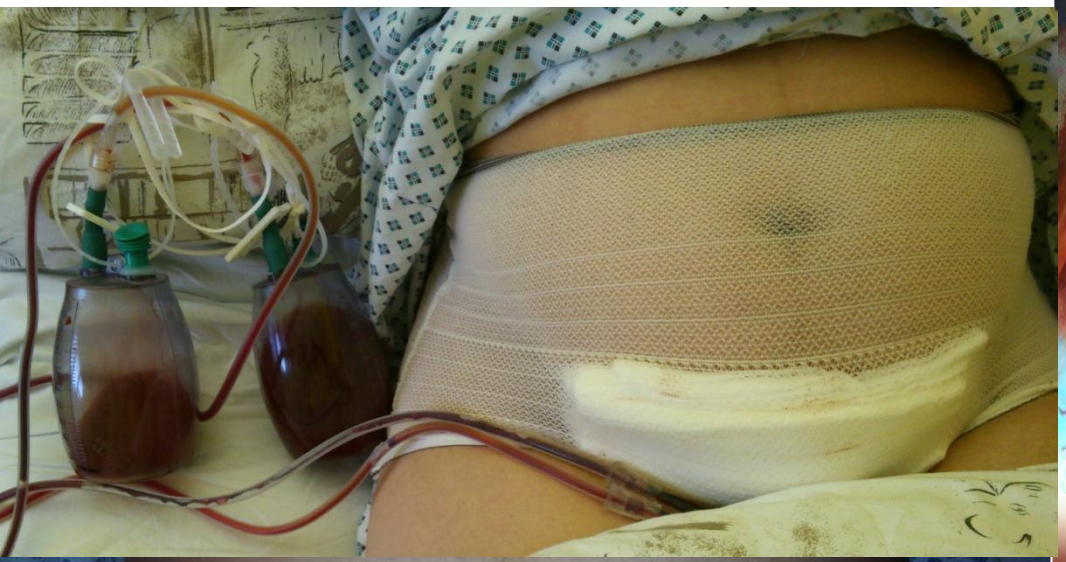


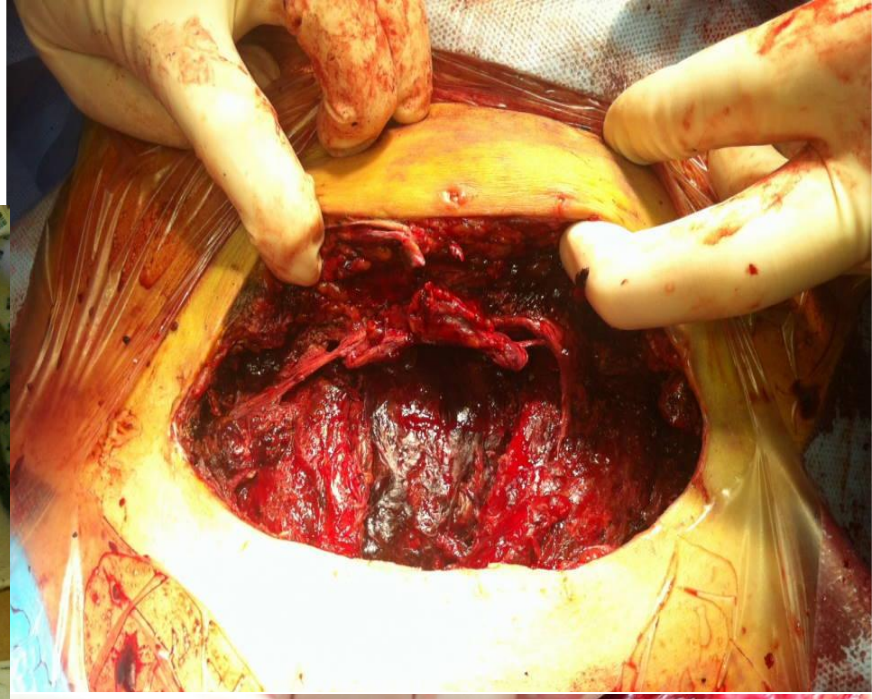




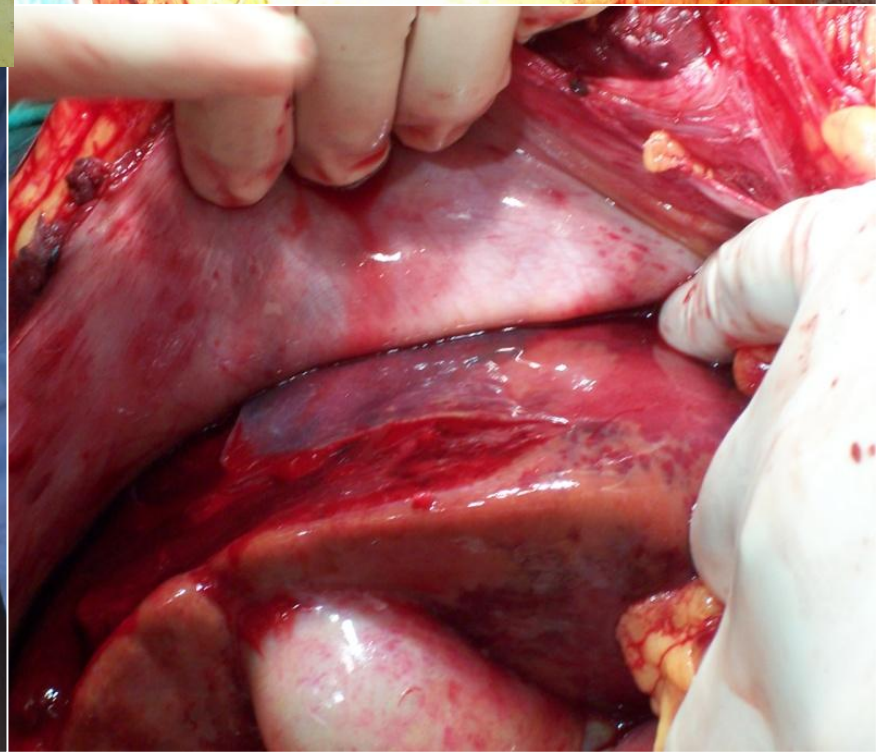
Lung edema
Brain edema
Cerebral haemorrhage

Clinical manifestations

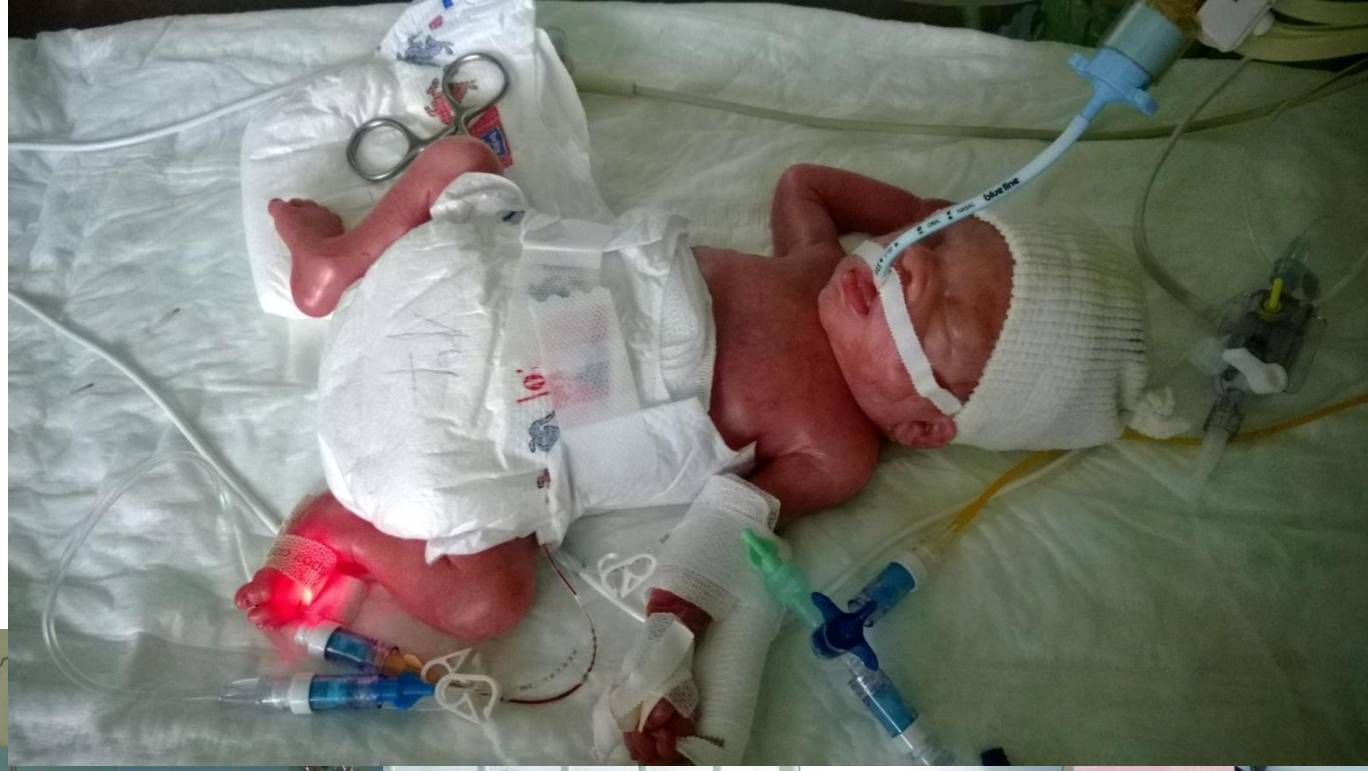




Bleeding manifestations
DIC
Liver rupture



Clinical manifestations



Fluid retention
Oliguria / anuria
Maternal death
Prematurita

Care for pregnant women with chronic hypertension

Essential

Light forms often without medication

Target BP 150/100 mmHg

Termination of pregnancy only when impossibility of compensation

Secondary

As recommended by the specialist and the status of organ functions

Therapy

YES: methyldopa, beta blockers, calcium channel blockers

NO: diuretics, ACEI

Care for pregnant women with chronic hypertension

Light

Monitoring, resting regimen, antihypertensives

Induction in term pregnancy

Severe (incl. Eclampsia)

End of pregnancy

MgSO4, antihypertensive therapy, consistent adjustment of fluid balance

HELLP

Termination of pregnancy within 24 hours

MgSO4, antihypertensives, consistent fluid balance adjustment, DIC treatment

Corticosteroids? Plasmaferesis?

Risk of cardiovascular disease

Cardiovascular mortality after pre-eclampsia in one child mothers: prospective, population based cohort study


OPEN ACCESS

Rolv Skjaerven *professor*[1 2], Allen J Wilcox *senior investigator*[3], Kari Klungsøyr *associate professor*[1 2], Lorentz M Irgens *professor*[1 2], Bjørn Egil Vikse *associate professor*[4 5], Lars J Vatten *professor*[6], Rolv Terje Lie *professor*[1 2]

Risk of cardiovascular disease

Cardiovascular mortal
child mothers: prospe
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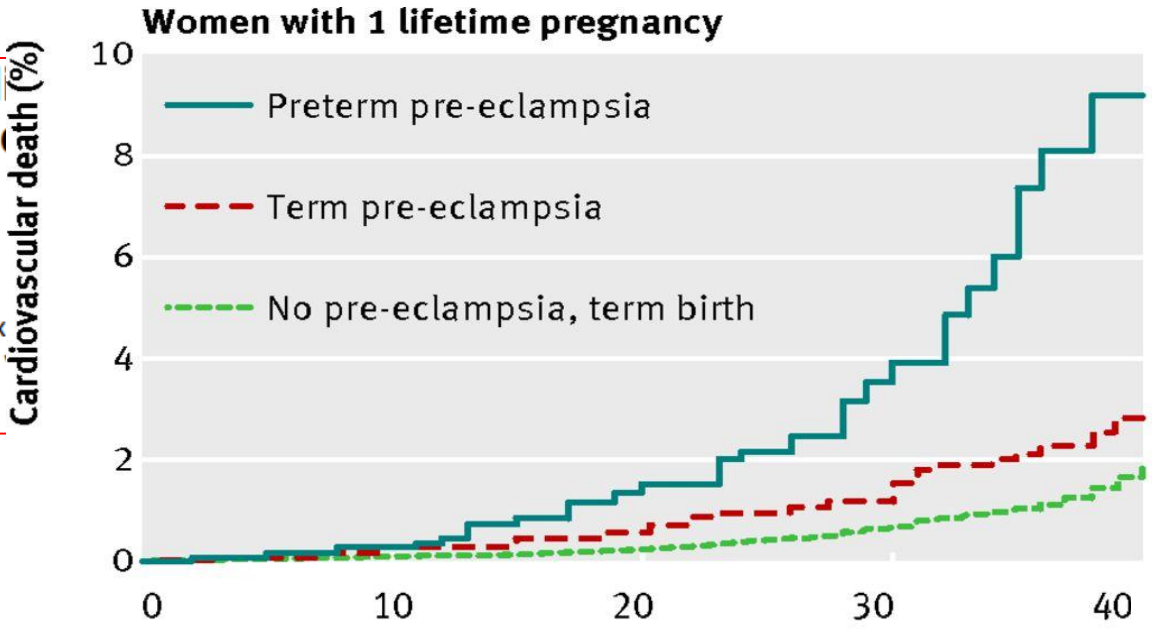

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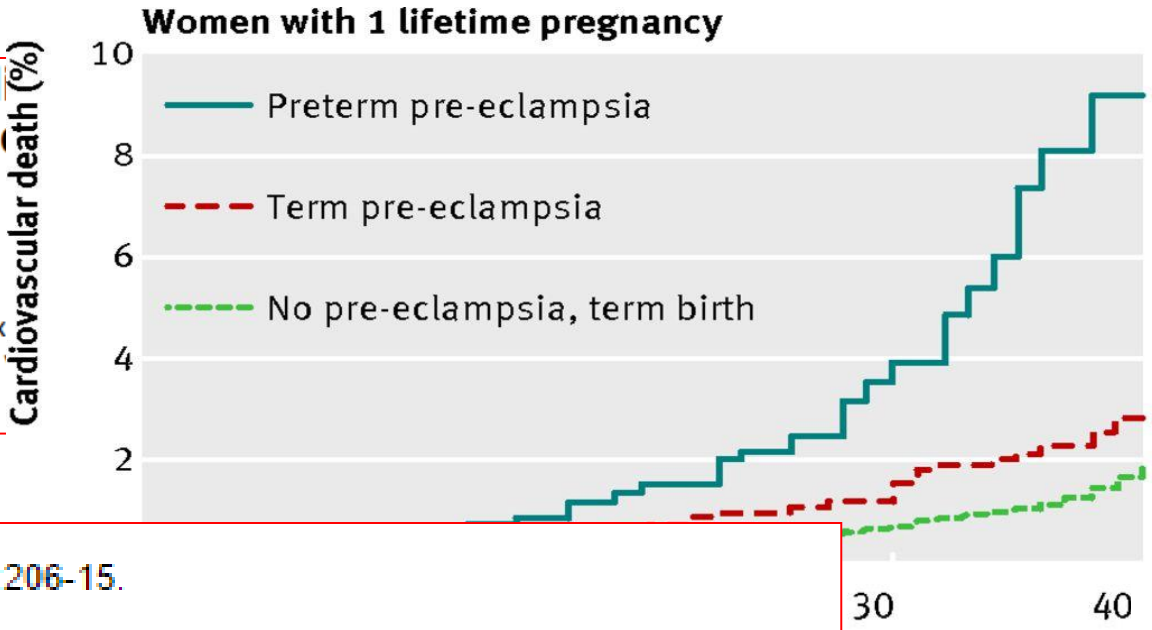

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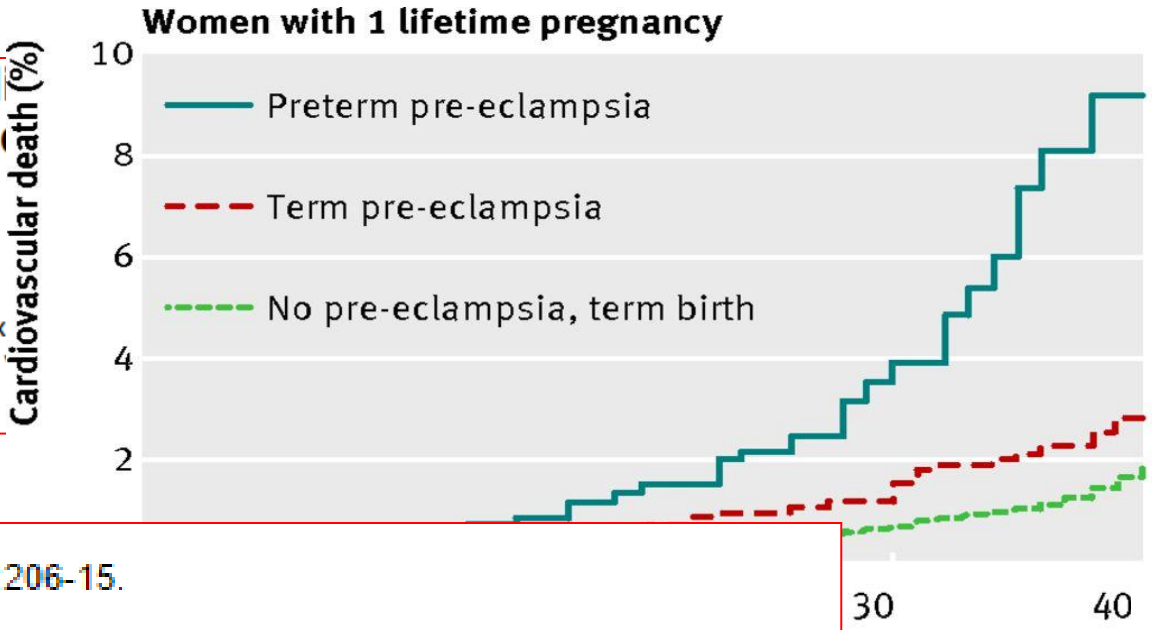

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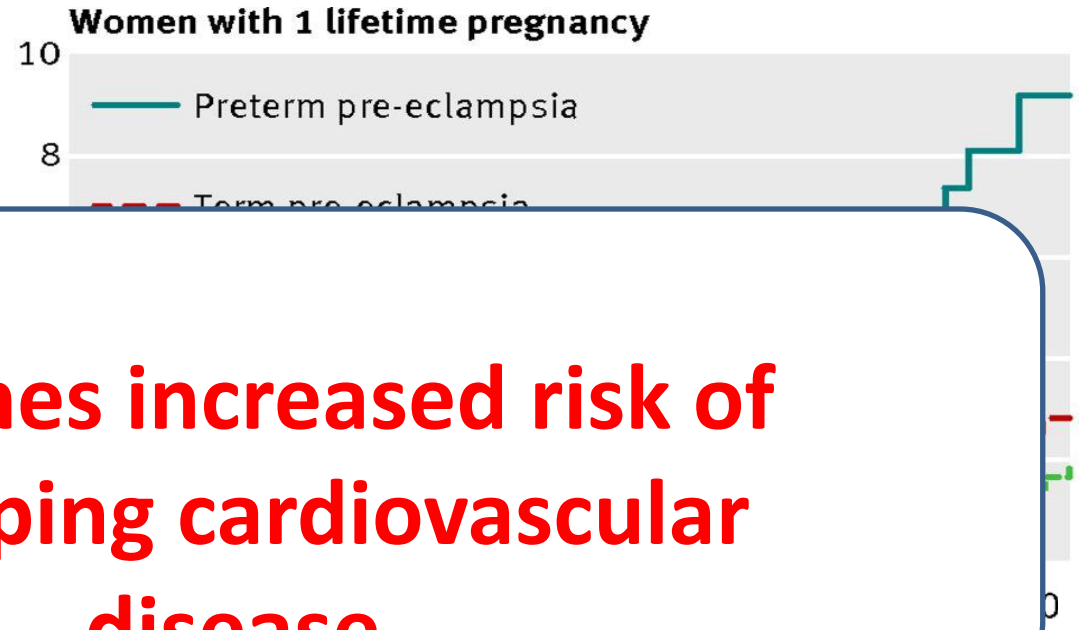
Risk of cardiovascular disease



2 - 3 times increased risk of developing cardiovascular disease

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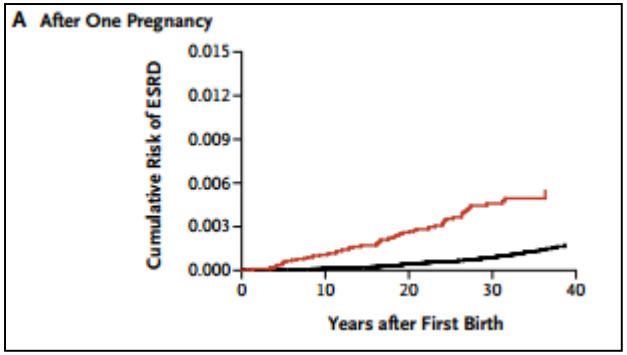

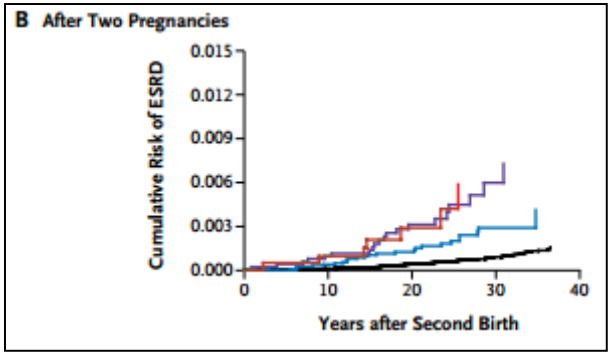

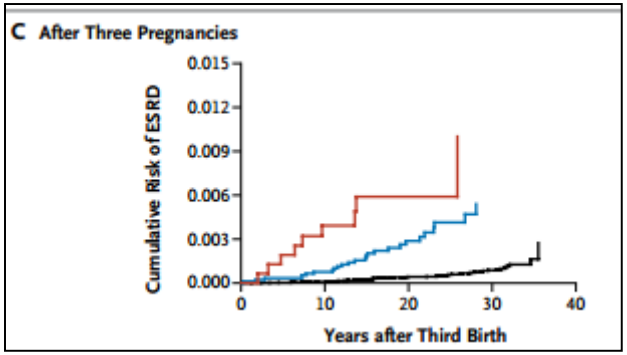

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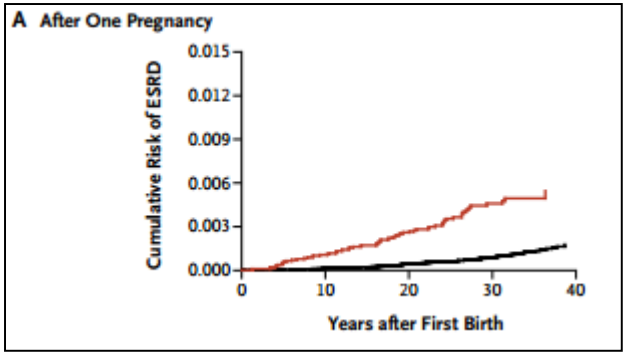

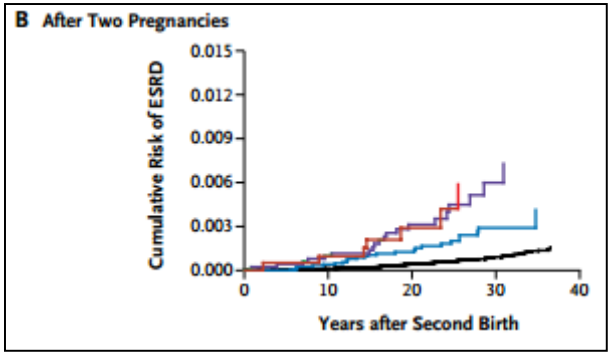

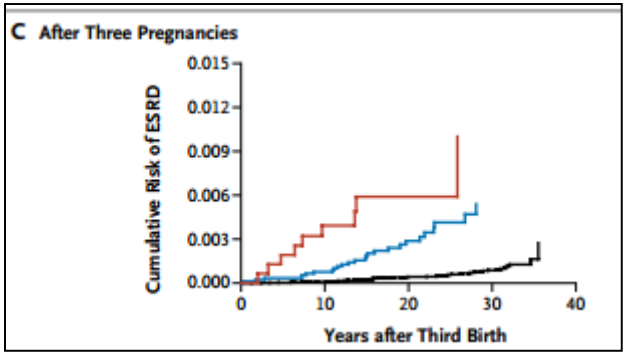

Am J Kidney Dis. 2010 Jun;55(6):1026-39. doi: 10.1053/j.ajkd.2009.12.036. Epub 2010 Mar 25.

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3 - 5x increased risk of developing chronic renal disease and increased incidence of microalbuminuria

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Epidemiological risk for PE

RF	PE *
Previous PE	8x
BMI over 35, DM	4x
Multipara, twins	3x
Age over 40, HT, renal or autoimmune, interval between pregnancies over 10 years	2x

* Duckitt K. Harington D., Risk factors for preeclampsia at antenatal booking: systematic review of controlled studies. BMJ 2005, 330:565

Combined screening

Pregnant history

METHOD 10 % FPR	11. – 14. week Early PE %
?	
?	
?	
?	

Combined screening

METHOD 10 % FPR	11. – 14. week Early PE %
BP*	50
?	
?	
?	

* Poon LC., Hypertensive disorders in pregnancy: screening by systolic diastolic abd mean arterial pressure at 11-13 week. Hypertens Pregnancy. 2010, 30(1) 93-107

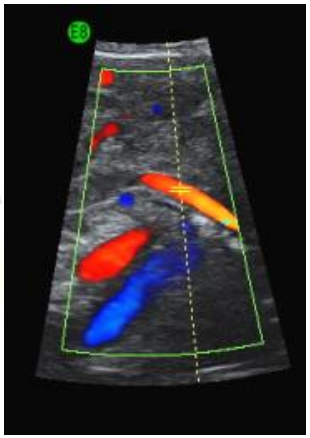
Crovetto F. Performance of first trimester integrated screening for early and late small for gestational age newborns F. IJOG. Accepted 2013

Combined screening

METHOD 10 % FPR	11. – 14. week Early PE %
BP	50
PLGF *	50
?	
?	

* Chaletz H.2007, Wortelboer EJ. BJOG 2010, Schnauer FI.Placenta 2012, Wortelboer EJ. BJOG 2010, Poon LCY.et al.Prenat.Diag.2008

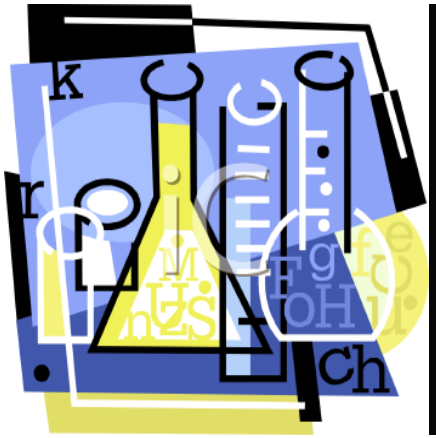
Combined screening

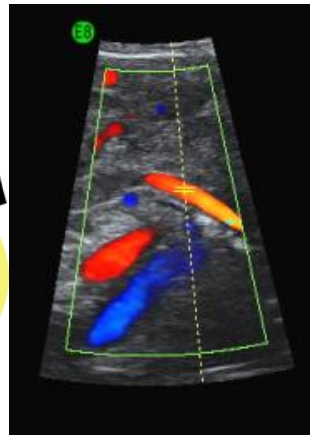


METHOD 10 % FPR	11. – 14. week Early PE %
BP	50
PLGF	50
Doppler UtA *	25
?	

* Van den Elzen 95, Martin 01, Vainio 05, Ebrashy 05, Gómez 05, Parra 05, Piasencia 07

Combined screening





METHOD 10 % FPR	11. – 14. week Early PE %
BP	50
PLGF	50
Doppler UtA	25
BP, PLGF, UtA *	80

* Yu CK. Am.J.Obstet.Gynekol.2006, Poon LCY Prenat.Diag.2008, Poon LC.Hypertension 2009, Khall A.IJOG 2010, Poon LC.,J.Horn Hypertensis 2010, Youseff A. Prenat.Diagn.2011, D.Lorenzo. Placenta 2012, Karagiannis G. Fetal Diag.Therapy 2011, Schazzechio E. AJOG 2012

Prevention

BMJ Open. 2016; 6(6): e011801.
Published online 2016 Jun 28. doi: 10.1136/bmjopen-2016-011801
PMCID: PMC4932292

Study protocol for the randomised controlled trial: combined multimarker screening and randomised patient treatment with ASpirin for evidence-based PREeclampsia prevention (ASPRE)

Neil O'Gorman,[1] David Wright,[2] Daniel L Rolnik,[1] Kypros H Nicolaides,[1] and Liona C Poon[1]

Author information ▶ Article notes ▶ Copyright and License information ▶

funded by EU FP7
ASPRE
project
SEVENTH FRAMEWORK PROGRAMME

acetylsalicylic acid - 150 mg - reduction of early-PE incidence by 38%

Take home message

Hypertension in pregnancy is a serious condition and must be properly diagnosed, classified and treated

Preeclampsia is a systemic disease with long-term consequences

Preeclampsia can be predicted

We have relatively effective prevention

Serious forms (HELLP) are rare and awareness of their existence is relatively low

Thank you for your attention