Development and validation of Prediction models for Risks of complications in Early-onset Pre-eclampsia (PREP): a prospective cohort study

Shakila Thangaratinam,1,2,3* John Allotey,1,2,3 Nadine Marlin,3 Ben W Mol,4 Peter Von Dadelszen,5 Wessel Ganzevoort,6 Joost Akkermans,7 Asif Ahmed,8 Jane Daniels,9 Jon Deeks,10 Khaled Ismail,11 Ann Marie Barnard,12 Julie Dodds,1,2,3 Sally Kerry,3 Carl Moons,13 Richard D Riley14 and Khalid S Khan1,2,3 on behalf of the PREP study group

1Women’s Health Research Unit, Barts and the London School of Medicine and Dentistry, Queen Mary University of London, London, UK
2Multidisciplinary Evidence Synthesis Hub (MESH), Queen Mary University of London, London, UK
3Pragmatic Clinical Trials Unit, Barts and The London School of Medicine and Dentistry, Queen Mary University of London, London, UK
4School of Paediatrics and Reproductive Health, University of Adelaide, Adelaide, SA, Australia
5Institute of Cardiovascular and Cell Sciences, University of London, London, UK
6Department of Obstetrics and Gynaecology, Academic Medical Centre, Amsterdam, the Netherlands
7Department of Obstetrics, Leiden University Medical Centre, Leiden, the Netherlands
8School of Life and Health Sciences, Aston University, Birmingham, UK
9Birmingham Clinical Trials Unit, University of Birmingham, Birmingham, UK
10School of Health and Population Sciences, University of Birmingham, Birmingham, UK
11Birmingham Centre for Women’s and Children’s Health, University of Birmingham, Birmingham, UK
12Action on Pre-eclampsia Charity (APEC), Evesham, UK
13Julius Centre for Health Sciences and Primary Care, University Medical Centre Utrecht, Utrecht, the Netherlands
14Research Institute for Primary Care and Health Sciences, Keele University, Keele, UK

*Corresponding author s.thangaratinam@qmul.ac.uk
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Plain English summary

Pre-eclampsia is a disorder in pregnancy, characterised by raised blood pressure and protein in the urine. When it occurs before 34 weeks of pregnancy (early onset), it causes serious complications for the mother and baby. The only known cure for pre-eclampsia is delivery of the baby. There is a lack of sufficient evidence regarding the ability of tests to correctly predict complications to the mother or baby to inform management.

The PREP (Prediction of Risks in Early-onset Pre-eclampsia) study aims to provide estimates of risks faced by mothers, using tests that are routinely performed in the NHS.

We developed two models. The first model (PREP-L) provided overall individual risk estimates from diagnosis of early-onset pre-eclampsia until discharge. The second model (PREP-S) provided risk estimates at various time points from diagnosis until 34 weeks of pregnancy. The models’ performance was assessed in populations outside the UK (Canada and the Netherlands).

A total of 946 women with early-onset pre-eclampsia from 53 hospitals in the UK participated in the study. For 82% of the women participating, the PREP-L model accurately predicted those mothers who will develop complications. The PREP-S model predicted accurately in 76% of women. The PREP-L model performed similarly in non-UK populations. Both models showed that the results could be generalised in an external population. Further studies are needed to assess the impact of the models’ use in improving outcomes for the mother and baby.
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