The severity of preeclampsia score: an e-Delphi study

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Disclosures

None

Overview

1. Rationale for the study
2. Aim
3. Method
4. Results
5. Limitations
6. Conclusions
7. Acknowledgments

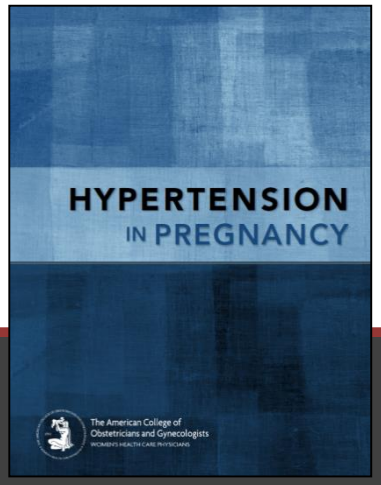
Rationale for the study

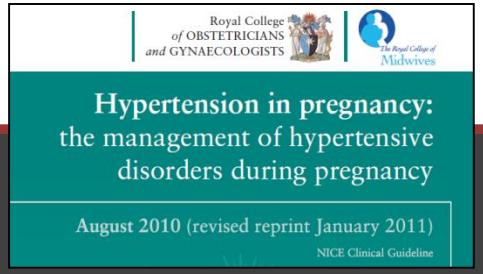
Preeclampsia is a life-threatening hypertensive multi-system disorder of pregnant women

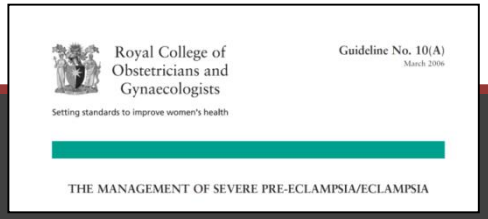
A leading cause of maternal and perinatal mortality

No agreed upon definition of the disease

No objective measure that quantifies the clinical severity of preeclampsia



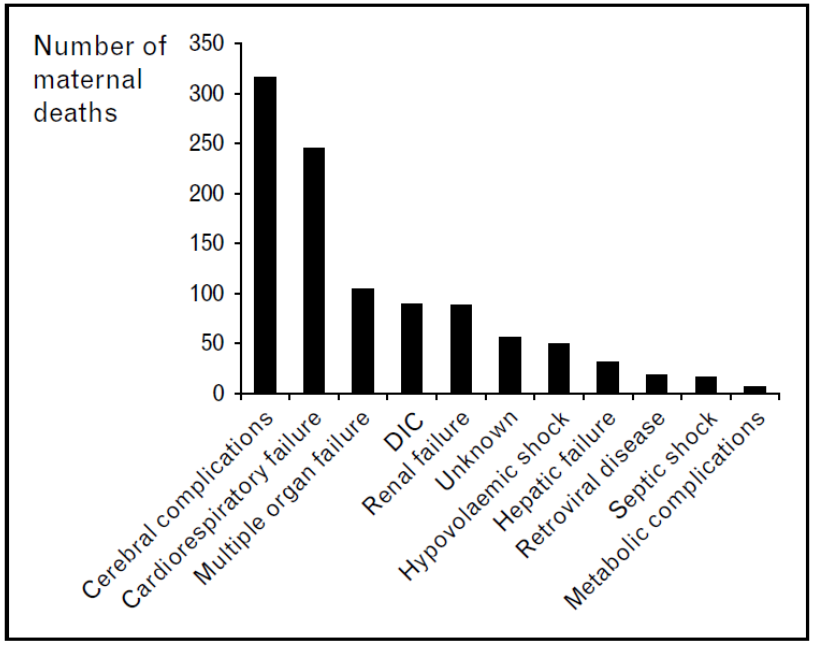




Rationale for the study

It is important to accurately detect and then manage women with severe disease as these are the women in whom severe morbidity and mortality occur

Figure 1 Contributory causes of maternal deaths due to hypertension in pregnancy: South Africa 2002–2004



Dyer RA et al Curr Opin Anaesthesiol 2007;20:168-74.

Rationale for the study

The Acute Physiology And Chronic Health Evaluation version II (APACHE II) is a well-validated severity of illness scoring tool

Highly utilised in the adult intensive care unit (ICU) setting

Twelve physiological parameters are used with the most deranged value in the first 24 hours of ICU admission used to calculate the APACHE II score

APACHE II has applications in ICU research, quality assurance activities, in ICU service and workforce planning, and in understanding the performance of different ICUs.

Knaus WA, Draper EA, Wagner DP, Zimmerman JE. APACHE II: a severity of disease classification system. *Critical Care Medicine*. 1985;13:818-29.
Lapinsky SE, Hallett D, Collop N, Drover J, Lavercombe P, Leeman M, et al. Evaluation of standard and modified severity of illness scores in the obstetric patient. *Journal of Critical Care*. 2011;26(5):535.e1-.e7.

THE APACHE II SEVERITY OF DISEASE CLASSIFICATION SYSTEM

PHYSIOLOGIC VARIABLE	HIGH ABNORMAL RANGE					LOW ABNORMAL RANGE			
	+4	+3	+2	+1	0	+1	+2	+3	+4
TEMPERATURE — rectal (°C)	≥41°	39°-40.9°		38.5°-38.9°	36°-38.4°	34°-35.9°	32°-33.9°	30°-31.9°	≤29.9°
MEAN ARTERIAL PRESSURE — mm Hg	≥160	130-159	110-129		70-109		50-69		≤49
HEART RATE (ventricular response)	≥180	140-179	110-139		70-109		55-69	40-54	≤39
RESPIRATORY RATE — (non-ventilated or ventilated)	≥50	35-49		25-34	12-24	10-11	6-9		≤5
OXYGENATION: A-aDO_2 or PaO_2 (mm Hg) a. FiO_2 ≥ 0.5 record A-aDO_2	≥500	350-499	200-349		<200				
b. FiO_2 < 0.5 record only PaO_2					PO_2 > 70	PO_2 61-70		PO_2 55-60	PO_2 < 55
ARTERIAL pH	≥7.7	7.6-7.69		7.5-7.59	7.33-7.49		7.25-7.32	7.15-7.24	<7.15
SERUM SODIUM (mMol/L)	≥180	160-179	155-159	150-154	130-149		120-129	111-119	≤110
SERUM POTASSIUM (mMol/L)	≥7	6-6.9		5.5-5.9	3.5-5.4	3-3.4	2.5-2.9		<2.5
SERUM CREATININE (mg/100 ml) (Double point score for **acute** renal failure)	≥3.5	2-3.4	1.5-1.9		0.6-1.4		<0.6		
HEMATOCRIT (%)	≥60		50-59.9	46-49.9	30-45.9		20-29.9		<20
WHITE BLOOD COUNT (total/mm3) (in 1,000s)	≥40		20-39.9	15-19.9	3-14.9		1-2.9		<1
GLASGOW COMA SCORE (GCS): Score = 15 minus actual GCS									
[A] Total ACUTE PHYSIOLOGY SCORE (APS): Sum of the 12 individual variable points									
Serum HCO_3 (venous-mMol/L) [Not preferred, use if no ABGs]	≥52	41-51.9		32-40.9	22-31.9		18-21.9	15-17.9	<15

[B] AGE POINTS:
Assign points to age as follows:

AGE(yrs)	Points
≤44	0
45-54	2
55-64	3
65-74	5
≥75	6

[C] CHRONIC HEALTH POINTS
If the patient has a history of severe organ system insufficiency or is immuno-compromised assign points as follows:
a. for nonoperative or emergency postoperative patients — 5 points
or
b. for elective postoperative patients — 2 points

DEFINITIONS
Organ Insufficiency or immuno-compromised state must have been evident **prior** to this hospital admission and conform to the following criteria:

LIVER: Biopsy proven cirrhosis and documented portal hypertension; episodes of past upper GI bleeding attributed to portal hypertension; or prior episodes of hepatic failure/encephalopathy/coma.

CARDIOVASCULAR: New York Heart Association Class IV.

RESPIRATORY: Chronic restrictive, obstructive, or vascular disease resulting in severe exercise restriction, i.e., unable to climb stairs or perform household duties; or documented chronic hypoxia, hypercapnia, secondary polycythemia, severe pulmonary hypertension (>40mmHg), or respirator dependency.

RENAL: Receiving chronic dialysis.

IMMUNO-COMPROMISED: The patient has received therapy that suppresses resistance to infection, e.g., immuno-suppression, chemotherapy, radiation, long term or recent high dose steroids, or has a disease that is sufficiently advanced to suppress resistance to infection, e.g., leukemia, lymphoma, AIDS.

APACHE II SCORE
Sum of [A] + [B] + [C] :

[A] APS points _____

[B] Age points _____

[C] Chronic Health points _____

Total APACHE II _____

FIG. 1. The APACHE II severity of disease classification system.

Knaus WA, et al APACHE II: a severity of disease classification system. *Critical Care Medicine*. 1985;13:818-29.

Rationale for the study

Preeclampsia is a major reason for pregnant women to be admitted to an intensive care unit

As a multisystem disease it is well suited to APACHE II framework however problems exist with APACHE II in this population:

Lacks specific markers for what we think is important in severe preeclampsia

- Systolic blood pressure
- Diastolic blood pressure
- Platelet count
- Eclampsia
- Gestational age
- Haemolysis
- Coagulopathy
- Hepatic abnormalities

Rationale for the study

Development of a scoring system, using the APACHE II framework, applicable to every woman with preeclampsia may assist with decisions related to

- Location of care and staffing levels
- Monitoring / observations – frequency and number
- Commencement of interventions such as magnesium sulphate
- Multidisciplinary involvement
- Planning for delivery

Rationale for the study

Delphi methodology

A method particularly suited to the examination of an issue where there is no conclusive hard evidence available and draws upon the expertise of individuals, and harnesses their judgment into a consensus opinion

1. Experts are surveyed electronically in a series of rounds.
2. Responses to each round are collated, analysed and redistributed to participants for further comment and refinement in successive rounds
3. The opinions of the individuals are then condensed into a group consensus.

Devane D, Begley CM, Clarke M, Horey D, Oboyle C. Evaluating Maternity Care: A Core Set of Outcome Measures. *Birth*. 2007;34(2):164-72.
Thangaratinam S, Ismail K, Sharp S, Coomarasamy A, O'Mahony F, Khan KS, et al. Prioritisation of Tests for the Prediction of Preeclampsia Complications: A Delphi Survey. *Hypertension in Pregnancy.* 2007;26(1):131-8.

Aims

To identify the variables that a group of international experts think are associated with the severity of clinical presentation of preeclampsia

Method

1. Following ethics approval (FHEC12/168 La Trobe University, Faculty of Health Sciences 20/11/2012), an electronic 3-Round Delphi (e-Delphi) survey was conducted

2. Multi-disciplinary professionals with known expertise in preeclampsia were invited to participate, along with colleagues suggested via snowball sampling

Method

1. In Round 1, participants ranked variables as to usefulness in describing severity of preeclampsia, using a seven-point Likert scale

Variable	1 Not important	2 Slightly important	3 Some importance	4 Moderate importance	5 Very important	6 Great importance	7 Extremely important

2. Participants included additional variables if they thought key variables were missing from the data set

Method

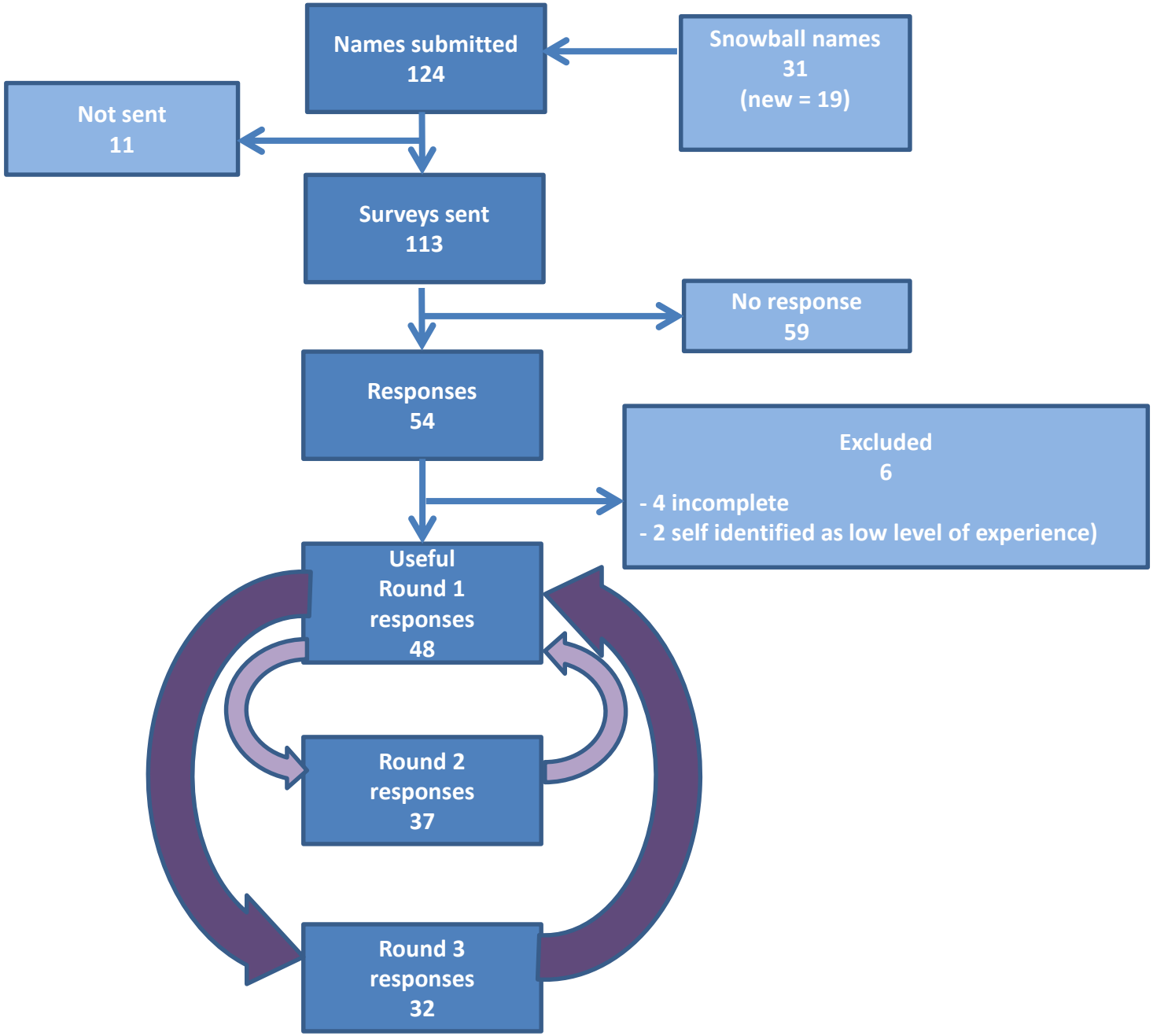
3. After feedback from Round 1 participants were then sent a Round 2 survey incorporating new variables from Round 1 and any variables with disagreement between experts

Disagreement was defined as more than 20% of responses in each of categories 1 or 2 and categories 5 or 6 or 7

4. After feedback from Round 2 participants were sent a Round 3 survey including all variables with median ≥ 4 score from Round 1 and Round 2.

Investigators did not participate in the survey

Results


Names submitted
124
Snowball names
31
(new = 19)
Not sent
11
Surveys sent
113
No response
59
Responses
54
Excluded
6
- 4 incomplete
- 2 self identified as low level of experience)
Useful
Round 1
responses
48
Round 2
responses
37
Round 3
responses
32

Results - Participants

Country of work	n=48 (%)
Australia	26 (54)
Canada	6 (13)
United Kingdom	5 (10)
New Zealand	3 (6)
United States of America	3 (6)
Netherlands	2 (4)
Croatia	1 (2)
South Africa	1 (2)
Taiwan	1 (2)

Characteristic	Median (IQR)
Years of experience	21 (14-26)
Level of self-perceived expertise (on a rating of 1-5 with 5 expert)	4 (4-5)

Results - Participants

Clinical specialty	n=48 (%)
Maternal-fetal medicine	18 (38)
Obstetrics	10 (21)
Obstetric medicine &/or Nephrology	9 (19)
Anaesthesiology	5 (10)
Midwifery	4 (8)
Epidemiology	2 (4)

Results - Participants

Utility of a severity of preeclampsia score	n=48 (%)
Research utility	45 (94)
Clinical utility	39 (81)
Would use in clinical practice	32/44 (73)*

*Not active clinically n=4

Results – Maternal symptoms and signs

Variable	Round 1 (n=48)	
	Median (IQR)	Mean (95%CI)
Neurological symptoms	7 (6-7)	6.5 (6.2-6.7)
Epigastric pain	5 (4.25-6.0)	5.3 (4.9-5.6)
Altered deep tendon reflexes	4.5 (3-6)	4.3 (3.8-4.8)

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Altered deep tendon reflexes	4.5 (3-6)	4.3 (3.8-4.8)
Urine output (oliguria)		
Severe nausea and vomiting		
Mother's perception of feeling "generally unwell"		
Oedema (generalised, rapid onset)		
Pulmonary oedema		
Separate systolic BP		
Separate diastolic BP		
Dyspnoea		
Low oxygen saturation on air		

Results – Maternal symptoms and signs

Variable	Round 1 (n=48)		Round 2 (n=37)	
	Median (IQR)	Mean (95%CI)	Median (IQR)	Mean (95%CI)
Neurological symptoms	7 (6-7)	6.5 (6.2-6.7)		
Epigastric pain	5 (4.25-6.0)	5.3 (4.9-5.6)		
Altered deep tendon reflexes	4.5 (3-6)	4.3 (3.8-4.8)		
Urine output (oliguria)			6 (5-7)	5.7 (5.3-6.1)
Severe nausea and vomiting			5 (3.5-5.5)	4.5 (4.0-5.0)
Mother's perception of feeling "generally unwell"			4 (4-6)	4.7 (4.3-5.1)
Oedema (generalised, rapid onset)			4 (3-5)	3.9 (3.4-4.4)
Pulmonary oedema			7 (6-7)	6.3 (6.0-6.6)
Separate systolic BP			6 (5-7)	5.9 (5.6-6.3)
Separate diastolic BP			6 (5-6)	5.5 (5.1-5.9)
Dyspnoea			5 (4-6)	5.2 (4.8-5.6)
Low oxygen saturation on air			6 (5-7)	5.8 (5.3-6.3)

Results – Maternal symptoms and signs

Variable	Round 1 (n=48)		Round 2 (n=37)		Round 3 (n=32)	
	Median (IQR)	Mean (95%CI)	Median (IQR)	Mean (95%CI)	Median (IQR)	Mean (95%CI)
Neurological symptoms	7 (6-7)	6.5 (6.2-6.7)			6.5 (6.0-7.0)	6.3 (6.0-6.6)
Epigastric pain	5 (4.25-6.0)	5.3 (4.9-5.6)			5 (5-6)	5.3 (4.9-5.7)
Altered deep tendon reflexes	4.5 (3-6)	4.3 (3.8-4.8)			4 (4-5)	4.3 (3.7-4.8)
Urine output (oliguria)			6 (5-7)	5.7 (5.3-6.1)	5.5 (4.3-6.0)	5.3 (4.8-5.7)
Severe nausea and vomiting			5 (3.5-5.5)	4.5 (4.0-5.0)	5 (4-6)	4.5 (4.0-5.0)
Mother's perception of feeling "generally unwell"			4 (4-6)	4.7 (4.3-5.1)	4 (4-5)	4.2 (3.9-4.5)
Oedema (generalised, rapid onset)			4 (3-5)	3.9 (3.4-4.4)	3 (3-5)	3.8 (3.3-4.3)
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Separate diastolic BP			6 (5-6)	5.5 (5.1-5.9)	5 (5-6)	5.3 (5.0-5.7)
Dyspnoea			5 (4-6)	5.2 (4.8-5.6)	5.0 (4.3-6.0)	5.2 (4.7-5.7)
Low oxygen saturation on air			6 (5-7)	5.8 (5.3-6.3)	6 (5-7)	5.7 (5.2-6.1)

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Altered deep tendon reflexes	4.5 (3-6)	4.3 (3.8-4.8)			4 (4-5)	4.3 (3.7-4.8)
Urine output (oliguria)			6 (5-7)	5.7 (5.3-6.1)	5.5 (4.3-6.0)	5.3 (4.8-5.7)
Severe nausea and vomiting			5 (3.5-5.5)	4.5 (4.0-5.0)	5 (4-6)	4.5 (4.0-5.0)
Mother's perception of feeling "generally unwell"			4 (4-6)	4.7 (4.3-5.1)	4 (4-5)	4.2 (3.9-4.5)
Oedema (generalised, rapid onset)			4 (3-5)	3.9 (3.4-4.4)	3 (3-5)	3.8 (3.3-4.3)
Pulmonary oedema			7 (6-7)	6.3 (6.0-6.6)	7 (6-7)	6.2 (5.8-6.6)
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Separate diastolic BP			6 (5-6)	5.5 (5.1-5.9)	5 (5-6)	5.3 (5.0-5.7)
Dyspnoea			5 (4-6)	5.2 (4.8-5.6)	5.0 (4.3-6.0)	5.2 (4.7-5.7)
Low oxygen saturation on air			6 (5-7)	5.8 (5.3-6.3)	6 (5-7)	5.7 (5.2-6.1)

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Low oxygen saturation on air			6 (5-7)	5.8 (5.3-6.3)	6 (5-7)	5.7 (5.2-6.1)

Results – Maternal blood and urine

Variable (maternal blood and urine tests)	Round 1 (n=48)	
	Median (IQR)	Mean (95%CI)
Platelet count	6 (5-7)	5.8 (5.5-6.1)
Aspartate aminotransferase level	5 (4-6)	5.0 (4.7-5.4)
Alanine aminotransferase level	5 (4-6)	5.0 (4.7-5.3)
Lactate dehydrogenase level	4 (3-5)	4.2 (3.8-4.6)
Serum bilirubin level	3 (3-5)	3.5 (3.1-3.9)
Serum uric acid level	4 (3-5)	4.2 (3.8-4.6)
Spot urine protein/creat inine ratio	5 (4-6)	5.0 (4.6-5.4)
Plasma fibronectin	2 (1-3)	2.4 (2.0-2.9)
sFlt-1/PIGF ratio	3 (2-4)	3.2 (2.7-3.7)
Serum alpha-fetoprotein	2 (1-3)	2.4 (2.0-2.9)

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Serum urea		
Coagulopathy – prothrombin time/International normalised ratio		
Fibrinogen level		
Full blood examination– evidence of haemolysis/fragmentation		

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Serum alpha-fetoprotein	2 (1-3)	2.4 (2.0-2.9)		
Serum urea			4 (3-5)	3.9 (3.4-4.4)
Coagulopathy – prothrombin time/International normalised ratio			6 (5-7)	5.5 (5.0-5.9)
Fibrinogen level			4 (2-5)	3.8 (3.3-4.4)
Full blood examination– evidence of haemolysis/fragmentation			6 (5.0-6.5)	5.5 (5.0-5.9)

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sFlt-1/PlGF ratio	3 (2-4)	3.2 (2.7-3.7)				
Serum alpha-fetoprotein	2 (1-3)	2.4 (2.0-2.9)				
Serum urea			4 (3-5)	3.9 (3.4-4.4)	4 (3-5)	4.0 (3.5-4.5)
Coagulopathy – prothrombin time/International normalised ratio			6 (5-7)	5.5 (5.0-5.9)	6 (5-6)	5.6 (5.3-5.9)
Fibrinogen level			4 (2-5)	3.8 (3.3-4.4)	4.0 (2.3-5)	3.9 (3.3-4.5)
Full blood examination– evidence of haemolysis/fragmentation			6 (5.0-6.5)	5.5 (5.0-5.9)	6 (5-7)	5.7 (5.2-6.1)

Results – Maternal blood and urine

Variable (maternal blood and urine tests)	Round 1 (n=48)		Round 2 (n=37)		Round 3 (n=32)	
	Median (IQR)	Mean (95%CI)	Median (IQR)	Mean (95%CI)	Median (IQR)	Mean (95%CI)
Platelet count	6 (5-7)	5.8 (5.5-6.1)			6 (5-7)	5.9 (5.5-6.3)
Aspartate aminotransferase level	5 (4-6)	5.0 (4.7-5.4)			5.5 (5.0-6.0)	5.2 (4.7-5.7)
Alanine aminotransferase level	5 (4-6)	5.0 (4.7-5.3)			5(5-6)	5.3 (4.8-5.7)
Lactate dehydrogenase level	4 (3-5)	4.2 (3.8-4.6)			5.0 (3.3-6.0)	4.5 (4.0-5.0)
Serum bilirubin level	3 (3-5)	3.5 (3.1-3.9)	3 (2-4)	3.3 (2.8-3.7)		
Serum uric acid level	4 (3-5)	4.2 (3.8-4.6)			4.0 (3.3-5.0)	4.2 (3.6-4.7)
Spot urine protein/creat inine ratio	5 (4-6)	5.0 (4.6-5.4)			5.0 (4.0-5.8)	4.7 (4.2-5.2)
Plasma fibronectin	2 (1-3)	2.4 (2.0-2.9)				
sFlt-1/PlGF ratio	3 (2-4)	3.2 (2.7-3.7)				
Serum alpha-fetoprotein	2 (1-3)	2.4 (2.0-2.9)				
Serum urea			4 (3-5)	3.9 (3.4-4.4)	4 (3-5)	4.0 (3.5-4.5)
Coagulopathy – prothrombin time/International normalised ratio			6 (5-7)	5.5 (5.0-5.9)	6 (5-6)	5.6 (5.3-5.9)
Fibrinogen level			4 (2-5)	3.8 (3.3-4.4)	4.0 (2.3-5)	3.9 (3.3-4.5)
Full blood examination– evidence of haemolysis/fragmentation			6 (5.0-6.5)	5.5 (5.0-5.9)	6 (5-7)	5.7 (5.2-6.1)

Results – Maternal blood and urine

Variable (maternal blood and urine tests)	Round 1 (n=48)		Round 2 (n=37)		Round 3 (n=32)	
	Median (IQR)	Mean (95%CI)	Median (IQR)	Mean (95%CI)	Median (IQR)	Mean (95%CI)
Platelet count	6 (5-7)	5.8 (5.5-6.1)			6 (5-7)	5.9 (5.5-6.3)
Aspartate aminotransferase level	5 (4-6)	5.0 (4.7-5.4)			5.5 (5.0-6.0)	5.2 (4.7-5.7)
Alanine aminotransferase level	5 (4-6)	5.0 (4.7-5.3)			5(5-6)	5.3 (4.8-5.7)
Lactate dehydrogenase level	4 (3-5)	4.2 (3.8-4.6)			5.0 (3.3-6.0)	4.5 (4.0-5.0)
Serum bilirubin level	3 (3-5)	3.5 (3.1-3.9)	3 (2-4)	3.3 (2.8-3.7)		
Serum uric acid level	4 (3-5)	4.2 (3.8-4.6)			4.0 (3.3-5.0)	4.2 (3.6-4.7)
Spot urine protein/creat inine ratio	5 (4-6)	5.0 (4.6-5.4)			5.0 (4.0-5.8)	4.7 (4.2-5.2)
Plasma fibronectin	2 (1-3)	2.4 (2.0-2.9)				
sFlt-1/PlGF ratio	3 (2-4)	3.2 (2.7-3.7)				
Serum alpha-fetoprotein	2 (1-3)	2.4 (2.0-2.9)				
Serum urea			4 (3-5)	3.9 (3.4-4.4)	4 (3-5)	4.0 (3.5-4.5)
Coagulopathy – prothrombin time/International normalised ratio			6 (5-7)	5.5 (5.0-5.9)	6 (5-6)	5.6 (5.3-5.9)
Fibrinogen level			4 (2-5)	3.8 (3.3-4.4)	4.0 (2.3-5)	3.9 (3.3-4.5)
Full blood examination– evidence of haemolysis/fragmentation			6 (5.0-6.5)	5.5 (5.0-5.9)	6 (5-7)	5.7 (5.2-6.1)

Results – Fetal and uterine factors

Variable (fetal and uterine factors)	Round 1 (n=48)	
	Median (IQR)	Mean (95%CI)
Gestation at onset	5 (5-6.75)	5.5 (5.2-5.8)
Fetal factors e.g. Intrauterine growth restriction	5 (5-6)	5.5 (5.2-5.8)
Placental factors e.g. abruption	6 (5-7)	5.7 (5.3-6.0)
Maternal uterine artery Doppler	3 (2-5)	3.7 (3.2-4.2)
Fetal and placental Doppler	5 (4-6)	5.0 (4.6-5.3)

Results – Fetal and uterine factors

Variable (fetal and uterine factors)	Round 1 (n=48)		Round 2 (n=37)	
	Median (IQR)	Mean (95%CI)	Median (IQR)	Mean (95%CI)
Gestation at onset	5 (5-6.75)	5.5 (5.2-5.8)		
Fetal factors e.g. Intrauterine growth restriction	5 (5-6)	5.5 (5.2-5.8)		
Placental factors e.g. abruption	6 (5-7)	5.7 (5.3-6.0)		
Maternal uterine artery Doppler	3 (2-5)	3.7 (3.2-4.2)	3 (2-4)	3.3 (2.8-3.8)
Fetal and placental Doppler	5 (4-6)	5.0 (4.6-5.3)		

Results – Fetal and uterine factors

Variable (fetal and uterine factors)	Round 1 (n=48)		Round 2 (n=37)		Round 3 (n=32)	
	Median (IQR)	Mean (95%CI)	Median (IQR)	Mean (95%CI)	Median (IQR)	Mean (95%CI)
Gestation at onset	**5 (5-6.75)**	**5.5 (5.2-5.8)**			**5 (4-6)**	**5.0 (4.5-5.5)**
Fetal factors e.g. Intrauterine growth restriction	**5 (5-6)**	**5.5 (5.2-5.8)**			**5 (4-6)**	**5.0 (4.6-5.5)**
Placental factors e.g. abruption	**6 (5-7)**	**5.7 (5.3-6.0)**			**6.0 (5.0-6.8)**	**5.7 (5.3-6.1)**
Maternal uterine artery Doppler	**3 (2-5)**	**3.7 (3.2-4.2)**	**3 (2-4)**	**3.3 (2.8-3.8)**		
Fetal and placental Doppler	**5 (4-6)**	**5.0 (4.6-5.3)**			**5 (4-6)**	**4.8 (4.3-5.3)**

Results – Fetal and uterine factors

Variable (fetal and uterine factors)	Round 1 (n=48)		Round 2 (n=37)		Round 3 (n=32)	
	Median (IQR)	Mean (95%CI)	Median (IQR)	Mean (95%CI)	Median (IQR)	Mean (95%CI)
Gestation at onset	5 (5-6.75)	5.5 (5.2-5.8)			5 (4-6)	5.0 (4.5-5.5)
Fetal factors e.g. Intrauterine growth restriction	5 (5-6)	5.5 (5.2-5.8)			5 (4-6)	5.0 (4.6-5.5)
Placental factors e.g. abruption	6 (5-7)	5.7 (5.3-6.0)			6.0 (5.0-6.8)	5.7 (5.3-6.1)
Maternal uterine artery Doppler	3 (2-5)	3.7 (3.2-4.2)	3 (2-4)	3.3 (2.8-3.8)		
Fetal and placental Doppler	5 (4-6)	5.0 (4.6-5.3)			5 (4-6)	4.8 (4.3-5.3)

Results – Fetal and uterine factors

Variable (fetal and uterine factors)	Round 1 (n=48)		Round 2 (n=37)		Round 3 (n=32)	
	Median (IQR)	Mean (95%CI)	Median (IQR)	Mean (95%CI)	Median (IQR)	Mean (95%CI)
Gestation at onset	5 (5-6.75)	5.5 (5.2-5.8)			5 (4-6)	5.0 (4.5-5.5)
Fetal factors e.g. Intrauterine growth restriction	5 (5-6)	5.5 (5.2-5.8)			5 (4-6)	5.0 (4.6-5.5)
Placental factors e.g. abruption	6 (5-7)	5.7 (5.3-6.0)			6.0 (5.0-6.8)	5.7 (5.3-6.1)
Maternal uterine artery Doppler	3 (2-5)	3.7 (3.2-4.2)	3 (2-4)	3.3 (2.8-3.8)		
Fetal and placental Doppler	5 (4-6)	5.0 (4.6-5.3)			5 (4-6)	4.8 (4.3-5.3)

Limitations

Bias related to the selection of experts

Expert response bias

Low response rate

Conclusions

- Expert consensus is that clinical signs and haematological variables were the most valued
- Maternal uterine artery Doppler and serum biomarkers were considered least useful
- Next phase of the research work is to incorporate the high ranking descriptors into an adapted physiological framework and to prospectively apply to all women with preeclampsia at key times during their pregnancy management

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