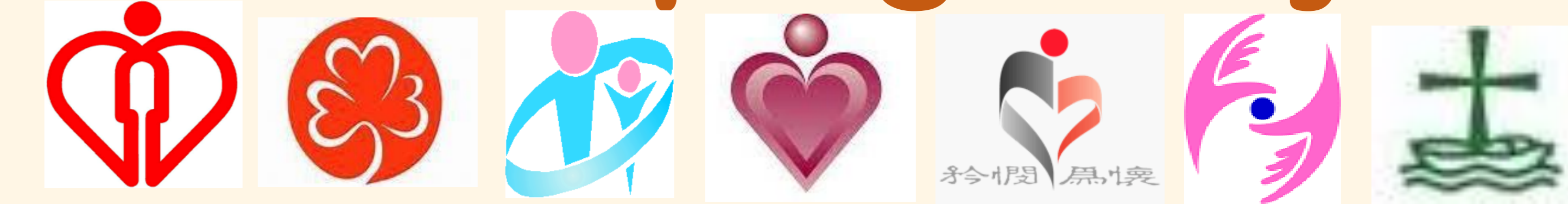


# Urinary Congophilia in triaging women with hypertensive disorders of pregnancy

PW Hui, SSY Chan, KW Cheung, F Lai, S Ho, T Ma, W Shu, PL So, WH Chung, KYK Chan



Department of Obstetrics & Gynaecology, Prenatal Diagnostic Laboratory

Queen Mary Hospital, Tsan Yuk Hospital, Queen Elizabeth Hospital, Pamela Youde Nethersole Eastern Hospital, Tuen Mun Hospital, United Christian Hospital, Hong Kong

**Objective:** **Urinary congophilia** is a feature that proteins in the urine bind Congo Red dye. It could represent a protein conformational disorder which might facilitate diagnosis of pre-eclampsia. This study evaluated the application of urinary congophilia in women with suspected pre-eclampsia.

**Method:** Women admitted **for blood pressure (BP) monitoring** in five hospitals in Hong Kong were recruited to provide 10 ml of urine for congophilia test using the Preeclampsia Detection Kit.

The sample was assayed within 12 hours of collection by one laboratory staff blinded to the clinical management and the result would not be disclosed to the managing obstetricians.

Diagnosis of **pre-eclampsia** was made based on International Society for the Study of Hypertension in Pregnancy in 2014. The obstetric parameters were analysed for correlation with congophilia.

**Results:** There were 169 women recruited from July 2020 to December 2021. **Pre-eclampsia** was diagnosed in 67 (**39.6%**) women while 131 (**77.5%**) women had any **hypertensive disorders** in pregnancy. The mean maternal age was 34.1 years old with 88.8% Chinese, 63.3% nulliparous women, 9.5% smokers and 26.0% taking aspirin.

Women with pre-eclampsia had significantly **higher mean blood pressure** (151mmHg Vs 143mmHg for systolic BP and 98mmHg Vs 91mmHg for diastolic BP), **earlier delivery** (36.3 weeks Vs 37.6 weeks) with babies of **lower birthweight** (2440 grams Vs 2750 grams) ( $p < 0.05$ ).

Among 138 women with **urinary congophilia** tests, **30 women** (**23 pre-eclampsia**, **2 chronic hypertensive with superimposed pre-eclampsia**, **3 gestational proteinuria** and **2 gestational hypertension**) had positive results. This was significantly associated with **pre-eclampsia** (chi square  $p < 0.001$ ) and any gestational **hypertensive disorders** (chi square  $p < 0.001$ ).

Overall, the **positive predictive value** (PPV) was **83.3% for pre-eclampsia** and **100% for any hypertensive disorders**. Excluding 26 cases with pre-eclampsia diagnosed by other clinical parameters upon admission, the PPV was lower for pre-eclampsia (75%) but remained at 100% for hypertensive disorder. However, the negative predictive value (NPV) 77.9% for pre-eclampsia and 31.1% for any hypertensive disorders.

	Sensitivity	Specificity	FPR	FNR	PPV	NPV
All women (n = 168)						
Pre-eclampsia (n = 67)	37.3	95	5	62.7	83.3	69.6
Hypertensive disorders (n = 130)	23.1	100	0	76.9	100	27.5
Excluding 26 women with pre-eclampsia diagnosed upon admission (n = 142)						
Pre-eclampsia (n = 42)	35.7	96	5	64.3	75	77.9
Hypertensive disorders (n = 104)	19.2	100	0	80.8	100	31.1

FPR – false positive rate, FNR – false negative rate, PPV – positive predictive value, NPV – negative predictive value

**Conclusions:** **Positive urinary congophilia** might serve as a juncture to facilitate the diagnosis of pre-eclampsia but its application could be limited by the **low sensitivity**. **Women with positive test results should be monitored closely for development of pre-eclampsia.**