

## INTISARI

Hipertensi dalam kehamilan atau preeklampsia sampai saat ini masih merupakan salah satu penyebab kematian terbesar di bidang obstetri selain perdarahan dan infeksi. Insiden penyakit ini terjadi antara 5-10 % dari seluruh kehamilan. Preeklampsia masih dikenal sebagai *disease of theory* karena penyebab pasti preeklampsia hingga kini belum diketahui dengan jelas. Perkembangan terakhir, preeklampsia dipandang sebagai keadaan dimana terdapat ketidakseimbangan faktor angiogenik dan faktor anti angiogenik dibandingkan kehamilan normal. Tujuan penelitian ini adalah untuk mempelajari perubahan kadar faktor angiogenik (VEGF dan PIGF), anti angiogenik (sVEGFR1) serta podosit (podocin) urin pada kehamilan normal dan preeklampsia di trimester I, II dan III.

Dilakukan penelitian *nested-case control* pada 23 kontrol hamil normal dan 23 kasus preeklampsia di RSUD A. Wahab Sjahranie Samarinda dari Maret 2012 sampai Februari 2014. Pada penelitian ini diperoleh data usia subyek, pendidikan, usia kehamilan, gestasi, paritas, BMI, tekanan darah, usia kehamilan saat persalinan, berat badan lahir, kadar VEGF, PIGF, sVEGFR1 dan podocin urin pada trimester I, II, III.

Hasil penelitian menunjukkan kadar VEGF kontrol meningkat 2-10 kali (rata-rata 2 kali) dengan puncak pada minggu ke 35-36. Kadar VEGF kasus di trimester I meningkat 2 kali dibandingkan kontrol ( $p > 0.05$ ). Kadar VEGF kasus menunjukkan tren meningkat dari trimester I sampai III. Kadar PIGF kontrol meningkat 2-44 kali (rata-rata 3 kali) dengan puncak pada minggu ke 35-36. Kadar PIGF kasus menunjukkan tren meningkat pada minggu ke-26 dan menurun pada minggu ke 35-36 minggu dibandingkan kontrol ( $p = 0.014$ ). Kadar sVEGFR1 kontrol hampir sama pada trimester I, II dan III. Kadar sVEGFR1 kasus meningkat 2- 62 kali (rata-rata 7 kali) dengan puncak pada minggu ke 35-36. Kadar sVEGFR1 kasus di trimester II meningkat 4 kali ( $p > 0.05$ ) dan di trimester III meningkat 7 kali dibandingkan kontrol ( $p = 0,061$ ). Kadar podocin kasus didapatkan sedikit menurun di trimester II dan kemudian meningkat pada trimester ke III. Kadar podocin urin kasus lebih tinggi pada trimester I, II ( $p = 0.01$ ) dan III dibandingkan kontrol. Dari perhitungan ROC, *area under curve* sVEGFR1 trimester III, podocin trimester II dan rasio sVEGFR1/PIGF trimester III mempunyai kekuatan sedang-baik (AUC 70-90) untuk memprediksi preeklampsia. Kadar sVEGFR1 urin trimester III pada titik potong 14,75 pg/mL mempunyai sensitivitas 78% dan spesifisitas 74%. Kadar podocin urin trimester II pada titik potong 0,415 ng/mL mempunyai sensitivitas 78% dan spesifisitas 61%. Rasio sVEGFR1/PIGF urin trimester III pada titik potong 0,2196 mempunyai sensitivitas 74% dan spesifisitas 87%.

Disimpulkan bahwa kadar VEGF urin pada kasus di trimester I meningkat dua kali ( $p > 0.05$ ), di trimester II sedikit lebih tinggi dibandingkan kontrol, sedangkan di trimester III tidak berbeda. Kadar PIGF urin pada kasus di trimester I lebih tinggi, di trimester II lebih rendah, di trimester III lebih rendah bermakna ( $p < 0.05$ ) dibandingkan kontrol. Kadar sVEGFR1 urin pada kasus di trimester I tidak berbeda, di trimester II meningkat rata-rata 4 kali ( $p > 0.05$ ), di trimester III meningkat rata-rata 7 kali ( $p < 0.05$ ) dibandingkan kontrol. Kadar podocin urin pada kasus di trimester I, trimester II ( $p < 0.05$ ) dan trimester III lebih tinggi dari kontrol.

**Kata kunci:** preeklampsia, faktor angiogenik, faktor antiangiogenik, VEGF, PIGF, sVEGFR1, podocin urin

## ABSTRACT

Preeclampsia or hypertension in pregnancy until now is still a major cause of mortality in obstetric beside bleeding and infection. Incidence of this disease around 5-10 % from all pregnancy. Preeclampsia is still known as *disease of theory* because the exact cause of preeclampsia is still unknown till now. In latest update, preeclampsia is seen as a condition of imbalance of angiogenic and antiangiogenic factor compare to normal pregnancy. The aims of this study were to evaluate the changes of the level of urinary angiogenic factors (VEGF and PIGF), antiangiogenic factor (sVEGFR1) and podocyte (podocin) in healthy pregnancy and preeclampsia during first, second and third trimester.

It was conducted a *nested-case control* study in 23 control of normal pregnancy and 23 cases with preeclampsia at A. Wahab Sjahranie General Hospital Samarinda from March 2012 till February 2014. In this study, data were obtained included age, education, parity, gestation, BMI, weeks of pregnancy, blood pressure, birth weight, serial urinary levels of VEGF, PIGF, sVEGFR1 and podocin in first, second and third trimester of pregnancies.

This study showed that urinary VEGF level in control increased 2-10 folds (average 2-folds), with peak on 35-36 weeks. Level of urinary VEGF cases in first trimester increased almost twice compare to control ( $p > 0.05$ ). Level of VEGF in cases showed an increased trend from first until third trimester. Urinary PIGF level in control increased 2-44 folds (average 3-folds), with peak on 35-36 weeks. Level of PIGF in cases showed increased trend in 26<sup>th</sup> weeks, then decreased at 35-36 weeks compared to control ( $p = 0.014$ ). Urinary sVEGFR1 control was similar from first until third trimester. Urinary sVEGFR1 level in cases increased 2-62 folds (average 7-folds), with peak on the third trimester. Level of sVEGFR1 cases in second trimester increased 4 times ( $p > 0.05$ ), in third trimester increased 7 times compared to control ( $p = 0,061$ ). Urinary podocin level in cases was slightly decreased in second trimester and then increased in third trimester. Level of urinary podocin in cases was higher at first trimester, second trimester ( $p = 0.01$ ) and third trimester compared to control. Using ROC curve, the area under curve of sVEGFR1 at third trimester, podocin at second trimester and sVEGFR1/PIGF ratio at third trimester had a moderate-good strength (AUC 70-90) to predict preeclampsia. Level of urinary sVEGFR1 third trimester at cut-off point 14,75 pg/mL had 78% sensitivity and 74% specificity. Level of urinary podocin in second trimester at cut-off point 0,415 ng/mL had 78% sensitivity dan 61% specificity. Ratio sVEGFR1/PIGF third trimester at cut-off point 0,2196 had 74% sensitivity dan 87% specificity.

It is concluded that the level of urinary VEGF in cases, at first trimester is increased twice ( $p > 0.05$ ), in second trimester slightly higher than control but there is no difference at third trimester. Level of urinary PIGF in cases at first trimester is higher than control ( $p > 0.05$ ), at second trimester is lower ( $p > 0.05$ ), at third trimester decreased 3 times in average ( $p < 0.05$ ). Level of urinary sVEGFR1 in cases at first trimester is not differ, at second trimester is increased 4 times in average ( $p > 0.05$ ), at third trimester is increase 7 times in average ( $p < 0.05$ ) compared to control. Level of urinary podocin in cases is higher at first trimester, second trimester ( $p < 0.05$ ), and third trimester compare to control.

**Key words:** preeclampsia, angiogenic factor, antiangiogenic factor, VEGF, PIGF, sVEGFR1, podocin urin