

Serum biomarker profiles of interleukin-6, tumor necrosis factor-alpha, matrix-metalloproteinase-2, and vascular endothelial growth factor in endometriosis staging

Wachyu Hadisaputra, author

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Abstrak

Latar belakang: Penelitian ini bertujuan untuk membandingkan kadar serum penanda biologis: interleukin-6 (IL-6), tumor necrosis factor-alpha (TNF-a), matrik-metalloproteinase-2 (MMP-2), dan vascular endothelial growth factor (VEGF) pada endometriosis stadium I-II dan stadium III-IV.

Metode: Penelitian ini adalah penelitian potong lintang pada empat puluh pasien endometriosis yang didiagnosis berdasarkan laparoskopi. Sampel serum diambil sebelum operasi, pemeriksaan penanda biologis dilakukan pada akhir penelitian dengan metode ELISA. Rerata kadar serum dibandingkan dengan menggunakan uji t tidak berpasangan.

Variabel yang memiliki perbedaan rerata bermakna diuji dengan pemeriksaan ROC dan ditentukan titik potong optimal.

Hasil: Kadar serum IL-6, TNF-a, dan MMP-2 tidak berbeda bermakna pada pasien endometriosis stadium I-II dan stadium III-IV dengan hasil rerata $1,58 \pm 0,78$ vs $1,55 \pm 0,98$ pg/mL; $1,5 \pm 0,47$ vs $1,49 \pm 0,29$ pg/mL; $152,04 \pm 27,32$ vs $140,98 \pm 28,08$ ng/mL. Hanya kadar VEGF yang memiliki perbedaan yang bermakna ($289,76 \pm 188,13$ vs $581,29 \pm 512,85$ pg/mL ($p < 0,05$)). Perbedaan rerata VEGF memiliki nilai AUC 74,5%. Titik potong optimal VEGF = 314,75 pg/mL dengan sensitivitas 78,6% dan spesifisitas 69,2%.

Kesimpulan: Penelitian ini menunjukkan penanda biologis serum VEGF (tetapi tidak IL-6, TNF-a, dan MMP-2) dapat digunakan untuk mengukur derajat keparahan endometriosis. Kadar VEGF dari 314,75 pg/mL merupakan titik potong antara stadium yang lebih rendah dan lebih tinggi dari derajat keparahan.

<hr><i>Background: The focus of this study was to compare serum biomarkers: interleukin-6 (IL-6), tumor necrosis factor-alpha (TNF-), matrix-metalloproteinase-2 (MMP-2) and vascular endothelial growth factor (VEGF) in endometriosis stage I-II and stage III-IV.

Methods: This is a cross-sectional study. Forty endometriosis patients were diagnosed using laparoscopy procedure. Serum

sample was taken before the surgery. The serum biomarkers (IL-6, TNF-, MMP-2, and VEGF) were analyzed with ELISA method at the end of research. Mean of serum biomarkers in endometriosis stage I-II and stage III-IV were compared using unpaired t-test. Variables that show significant mean difference were tested using ROC measurement and the optimal cut-off point was determined.

Results: There was no significant difference in mean serum biomarkers level of IL-6, TNF-, and MMP-2 between endometriosis stage I-II and stage III-IV (1.58 ± 0.78 vs 1.55 ± 0.98 pg/mL, 1.5 ± 0.47 vs $1.49 \pm$

0.29 pg/mL, and 152.04 ± 27.32 vs 140.98 ± 28.08 ng/mL, respectively). On the other hand, the comparison of VEGF level in endometriosis stage I-II and stage III-IV demonstrated significant difference (289.76 ± 188.13 vs 581.29 ± 512.85 pg/mL ($p < 0.05$)). Mean difference of VEGF had AUC of 74.5%. Optimal cut-off point for VEGF was 314.75 pg/mL with sensitivity 78.6% and specificity 69.2%.

Conclusion: This study showed that serum biomarkers of VEGF level (but not IL-6, TNF-, and MMP-2) can be used to measure the degree of severity in endometriosis. VEGF level of 314.75 pg/mL represents the cut-off point between lower and higher stage of severity.