

# Hubungan Gambaran Indeks Vaskular, Aliran Vaskular, dan Aliran Uterus Dengan Gambaran Makroskopis, Mikroskopis, dan Jumlah Perdarahan Pada Spektrum Plasenta Akreta = Relationship of placental vascular indices with macroscopic, histopathologic, and intra operative blood loss in placenta accreta spectrum disorders

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## Abstrak

Latar Belakang: Spektrum Plasenta Akreta (SPA) merupakan salah satu komplikasi obstetri dengan tingkat morbiditas yang tinggi. 3D Power Doppler telah banyak digunakan untuk meningkatkan diagnosis SPA, seperti menggunakan Plasenta Akreta Indeks, tetapi hanya mengukur secara kualitatif. Oleh karena itu, penelitian ini bertujuan untuk memahami hubungan kuantitatif indeks vaskularisasi plasenta terhadap temuan makroskopik, grading histopatologi, dan perdarahan intraoperatif pada kasus SPA.

Tujuan: Mengetahui hubungan indeks vaskular (vascular index / VI), indeks aliran (flow index / FI), dan indeks aliran vaskular (vascular flow Index / VFI) dengan diagnosis klinis, jumlah perdarahan dan temuan histopatologi SPA di Rumah Sakit Cipto Mangunkusumo.

Metode: Sebuah studi cross-sectional dilakukan pada 34 wanita, yang secara klinis didiagnosis dengan SPA. Power Doppler 3D yang dikombinasikan dengan perangkat lunak VOCAL II digunakan untuk mengukur tingkat indeks vaskularisasi (VI), indeks aliran (FI), dan indeks aliran vaskularisasi (VFI). Gambaran gross anatomy dan hasil histopatologi yang dikategorikan sebagai akreta, inkreta, dan perkreta. Tingkat kehilangan darah intra-operatif diukur dan diklasifikasikan sebagai perdarahan masif diatas 1500 ml. Data kemudian dianalisis menggunakan Statistical Package for Social Sciences (SPSS) versi 25.

Hasil: Median (min-max) untuk semua indeks vaskularisasi sebagai berikut: VI = 44,2 (23,7-74,9), FI = 35,4 (24,9-57), dan VFI = 15,3 (8,5-41,7). Nilai FI ditemukan signifikan dalam membandingkan tahap makroskopis ( $p=0,015$ ) dan memiliki korelasi positif sedang dalam kaitannya dengan perdarahan ( $r=0,449$ ). hasil analisa AUC of ROC VI, FI, dan VFI nilai batas terbukti sangat terkait dengan kehilangan darah 1500cc yaitu dengan hasil FI dengan nilai AUC of ROC 0.784, nilai cut off 38.9, OR: 10.00 (IK95% [1.58-63.09],  $p=0.014$ ),

VI dengan nilai AUC of ROC 0.712, nilai cut off 60.4, OR: 7.00 (IK95% [1.23-39.56],  $p=0.031$ ), dan VFI dengan nilai AUC of ROC 0.779, nilai cut off 23.2, OR: 9.16 (IK95% [1.53-54.59],  $p=0.015$ ).

Kesimpulan. Indeks Vaskularisasi Plasenta (VI) yang diukur dengan Power Doppler 3 dimensi dapat menjadi pemeriksaan tambahan Diagnostik SPA yang berpotensi dapat memprediksi kedalaman invasi SPA secara intra-pembedahan, jumlah perdarahan dan kemungkinan akan didapatkannya perdarahan masif pada pembedahan SPA

Kata Kunci. Plasenta akreta, 3D Power Doppler, indeks vaskular, indeks aliran, indeks aliran vaskular, perdarahan intraoperasi, histologi akreta

.....Background: Placenta Accreta Spectrum (PAS) is an obstetrical complication with a high level of morbidity. The 3D Power Doppler method has been widely used to improve the PAS diagnosis, such as using Placenta Accreta Index, but it only measures qualitative features. Therefore, this study aims to understand the relationship of quantitative placental vascular indices towards macroscopic findings,

histopathological grading, and intra-operative blood loss in cases of PAS disorder.

**Objectives:** Knowing the relationship between vascular index (VI), flow index (FI), and vascular flow index (VFI) with clinical diagnosis, amount of bleeding and histopathological findings of SPA at Cipto Mangunkusumo Hospital.

**Methods:** A cross-sectional study was conducted in 34 women, who were clinically diagnosed with PAS. The 3D Power Doppler in combination with VOCAL II software was used to measure the level of vascularization index (VI), flow index (FI), and vascularization flow index (VFI). Gross anatomical appearance and histopathology results were categorized as accreta, increta, and percreta. Intra-operative blood loss level was measured and classified as massive hemorrhage if it was 1500 ml. Data were then analyzed using Statistical Package for Social Sciences (SPSS) version 25.

**Results:** The median (min-max) for all vascularity indexes as follows: VI = 44.2 (23.7-74.9), FI = 35.4 (24.9-57), and VFI = 15.3 (8.5-41.7). FI value was found to be significant in comparing gross pathological stages ( $p=0.015$ ) and had a moderate positive correlation in relation to blood loss ( $r= 0.449$ ). The results of the AUC of ROC VI, FI, and VFI analysis above the cut-off values were shown to be strongly associated with blood loss 1500cc the results obtained:

FI with AUC of ROC value of 0.784, cut off value 38.9, OR: 10.00 (IK95% [1.58-63.09],  $p = 0.014$ ),

VI with AUC of ROC value of 0.712, cut off value 60.4, OR: 7.00 (IK95% [1.23-39.56],  $p = 0.031$ ), and

VFI with AUC of ROC value of 0.779, cut off value 23.2, OR: 9.16 (CI95% [1.53-54.59],  $p = 0.015$ ).

**Conclusion:** Flow index (FI) value from 3D Power Doppler ultrasound may become a potential diagnostic marker to predict the depth of PAS invasion prior to surgery, along with the level of blood loss intra-operatively.

**Keywords:** Placenta accreta spectrum (PAS), Ultrasound markers, Vascularization, Macroscopic, Histopathology, Blood loss, 3D Power Doppler Biopsy, Vascular Index, Flow Index, Vascular Flow Index