PERBANDINGAN UKURAN *VASCULAR PEDICLE WIDTH, VASCULAR PEDICLE-THORACIC RATIO,* DAN *VASCULAR PEDICLE-CARDIAC RATIO* ANTARA EDEMA PULMONUM KARDIOGENIK DENGAN NON KARDIOGENIK BERDASARKAN RADIOGRAFI TORAKS

Bernadet Dhanni Wulandari Sarwono[1], Yana Supriatna[2], Bambang Purwanto Utomo[2], Yohanes Widodo Wirohadidjojo[1], Sudarmanta[2], Wigati Dhamiyati[2]

[1]Program Studi Magister Ilmu Kedokteran Klinis dan [2]Departemen Radiologi, Fakultas Kedokteran, Kesehatan Masyarakat, dan Keperawatan, Universitas Gadjah Mada, Yogyakarta- Indonesia

INTISARI

Latar Belakang: Edema pulmonum merupakan akumulasi cairan abnormal di parenkim paru yang dapat menyebabkan gagal napas. Membedakan edema pulmonum kardiogenik dan non-kardiogenik penting untuk menentukan penatalaksanaan yang tepat. *Vascular Pedicle Width* (VPW) merupakan parameter radiografis sederhana dan non-invasif untuk menilai status volume intravaskular. Namun, variabilitas teknik radiografi dapat memengaruhi akurasi VPW, sehingga diperlukan parameter tambahan seperti *Vascular Pedicle-Thoracic Ratio* (VPTR) dan *Vascular Pedicle-Cardiac Ratio* (VPCR) untuk meningkatkan ketepatan diagnostik.

Tujuan: Penelitian ini bertujuan untuk membandingkan ukuran VPW, VPTR, dan VPCR antara edema pulmonum kardiogenik dan non-kardiogenik berdasarkan radiografi toraks serta menentukan nilai ambang batas optimal dari masing-masing parameter.

Metode: Penelitian ini merupakan studi observasional analitik dengan desain potong lintang menggunakan data sekunder pasien dengan diagnosis edema pulmonum di RSUP Dr. Sardjito periode Oktober 2023 hingga Oktober 2024. Data diperoleh melalui sistem PACS dan SIMETRISS. Sebanyak 97 pasien memenuhi kriteria inklusi, terdiri dari 70 pasien dengan edema pulmonum kardiogenik dan 27 pasien non kardiogenik. Pengukuran VPW, VPTR, dan VPCR dilakukan pada radiografi toraks proyeksi anteroposterior oleh dua dokter spesialis radiologi secara independen. Analisis statistik dilakukan dengan uji reliabilitas, uji komparatif, serta analisis kurva ROC untuk menentukan nilai ambang batas.

Hasil: Terdapat perbedaan bermakna ukuran VPW, VPTR, dan VPCR antara kelompok edema pulmonum kardiogenik dan non kardiogenik ($p < 0,05$). Nilai batas optimal diperoleh sebesar 7,09 cm untuk VPW, 0,23 untuk VPTR, dan 0,39 untuk VPCR dengan sensitivitas dan spesifisitas yang baik.

Kesimpulan: VPW, VPTR, dan VPCR merupakan parameter radiografis yang bermanfaat untuk membedakan edema pulmonum kardiogenik dan non-kardiogenik serta dapat menjadi alat bantu non-invasif dalam pengambilan keputusan klinis pada kasus edema pulmonum.

Kata Kunci: Edema pulmonum, VPW, VPTR, VPCR

COMPARISON OF VASCULAR PEDICLE WIDTH, VASCULAR PEDICLE-THORACIC RATIO, VASCULAR PEDICLE-CARDIAC RATIO BETWEEN CARDIOGENIK AND NON CARDIOGENIK PULMONARY EDEMA BASED ON CHEST RADIOGRAPHS

Bernadet Dhanni Wulandari Sarwono[1], Yana Supriatna[2], Bambang Purwanto Utomo[2], Yohanes Widodo Wirohadidjojo[1], Sudarmanta[2], Wigati Dhamiyati[2]

[1]Master Program in Clinical Medicine and [1]Radiology Department, Faculty of Medicine, Public Health and Nursing, Gadjah Mada University, Yogyakarta-Indonesia

ABSTRACT

Background: Pulmonary edema is an abnormal accumulation of extravascular fluid in the lung parenchyma, which may lead to respiratory failure. Differentiating between cardiogenic and non-cardiogenic pulmonary edema is crucial for proper management. Vascular Pedicle Width (VPW) is a simple, non-invasive radiographic parameter to assess intravascular volume status. However, variability in radiographic techniques can affect VPW accuracy. Therefore, additional measurements such as Vascular Pedicle-Thoracic Ratio (VPTR) and Vascular Pedicle-Cardiac Ratio (VPCR) have been proposed to improve diagnostic precision.

Objective: This study aims to compare VPW, VPTR, and VPCR measurements between cardiogenic and non-cardiogenic pulmonary edema on chest radiographs and to determine the optimal cut off values for these parameters.

Methods: This was a cross-sectional, analytical study using secondary data from patients diagnosed with pulmonary edema at RSUP Dr. Sardjito between October 2023 and October 2024. Data were obtained from the hospital's PACS and SIMETRISS systems. A total of 97 patients meeting the inclusion criteria were analyzed, with 70 classified as cardiogenic and 27 as non cardiogenic pulmonary edema cases. VPW, VPTR, and VPCR measurements were performed on anteroposterior chest radiographs by two independent radiologists. Statistical analyses included reliability testing, comparative tests, and ROC curve analysis to determine cutoff values.

Results: The study found significant differences in VPW, VPTR, and VPCR between cardiogenic and non-cardiogenic pulmonary edema groups ($p < 0.05$). The optimal cutoff values were identified as 7, 09 cm for VPW, 0,23 for VPTR, and 0,39 for VPCR, with acceptable sensitivity and specificity.

Conclusion: VPW, VPTR, and VPCR are useful radiographic measurements to differentiate cardiogenic from non-cardiogenic pulmonary edema. These parameters provide a practical, non-invasive tool to support clinical decision-making in cases of pulmonary edema.

Keywords: Pulmonary edema, VPW, VPTR, VPCR