

KORELASI *DISC HEIGHT INDEX* DENGAN DEGENERASI *DISCUS INTERVERTEBRALIS* KLASIFIKASI PFIRRMANN PADA MRI LUMBAL PASIEN *LOW BACK PAIN*

Sammy Raspati Sofardi¹, Yana Supriatna², Anita Ekowati², Budi Mulyono¹,
Henry Kusumo Husodoputro², Wigati Dhamiyati²

¹Program Studi Magister Ilmu Kedokteran Klinis dan ²Departemen Radiologi,
FK-KMK, Universitas Gadjah Mada, Daerah Istimewa Yogyakarta-Indonesia

INTISARI

Latar Belakang: *Low back pain (LBP)* merupakan keluhan muskuloskeletal utama dan penyebab disabilitas global, dengan degenerasi *discus intervertebralis* sebagai salah satu faktor kronis utama. Degenerasi ini menimbulkan perubahan struktural dan biokimia, yang pada MRI tampak sebagai penurunan tinggi *discus* dan intensitas sinyal T2. Klasifikasi Pfirrmann bersifat subjektif, sedangkan *Disc Height Index (DHI)* memberikan penilaian kuantitatif yang lebih objektif. Penelitian ini bertujuan menilai korelasi antara DHI dan klasifikasi Pfirrmann pada pasien LBP.

Metode: Studi analitik observasional dengan desain potong lintang (*cross-sectional*) menggunakan data retrospektif pasien LBP yang menjalani MRI lumbal di RSUP Dr. Sardjito Yogyakarta periode Januari 2023–Desember 2024. Sebanyak 50 pasien usia 41–70 tahun, tanpa riwayat trauma, infeksi, tumor, atau operasi tulang belakang, diikutsertakan dengan *consecutive sampling*. DHI dan klasifikasi Pfirrmann dinilai dari MRI. Reliabilitas antarpenilai diuji menggunakan ICC dan Cohen's Kappa, sedangkan analisis korelasi dilakukan dengan uji Pearson atau Spearman sesuai distribusi data.

Hasil: Penelitian melibatkan 50 pasien dengan rerata usia 53,9 tahun, mayoritas perempuan (62%). Rerata DHI pada setiap segmen lumbal relatif serupa (0,13–0,15). Segmen L3–4, L4–5, dan L5–S1 didominasi degenerasi Pfirrmann derajat 3–4, menandakan prevalensi degenerasi sedang hingga berat. Sebaliknya, L1–2 dan L2–3 lebih bervariasi, namun tetap banyak ditemukan derajat 2–3. Analisis menunjukkan korelasi berkekuatan sedang dengan arah negatif antara DHI dengan klasifikasi Pfirrmann di segmen L1-2 ($p = 0,006$; $r = -0,384$) dan L5-S1 ($p = 0,035$; $r = -0,300$), serta korelasi kuat dengan arah negatif di segmen L2-3 ($p < 0,001$; $r = -0,540$), L3-4 ($p < 0,001$; $r = -0,642$), dan L4-5 ($p < 0,001$; $r = -0,523$).

Kesimpulan: Terdapat korelasi berkekuatan sedang dengan arah negatif antara *Disc Height Index* dengan degenerasi *discus intervertebralis* berdasarkan klasifikasi Pfirrmann pada segmen L1-2 dan L5-S1, serta korelasi kuat dengan arah negatif di segmen L2-3, L3-4, dan L4-5 pada MRI lumbal pasien *low back pain*.

Kata Kunci: *Low back pain*; *Disc Height Index*; klasifikasi Pfirrmann; MRI lumbal; degenerasi *discus intervertebralis*

CORRELATION OF DISC HEIGHT INDEX WITH INTERVERTEBRAL DISC DEGENERATION PFIRRMANN CLASSIFICATION ON LUMBAR MRI IN LOW BACK PAIN PATIENTS

Sammy Raspati Sofardi¹, Yana Supriatna², Anita Ekowati², Budi Mulyono¹, Henry Kusumo Husodoputro², Wigati Dhamiyati²

¹Master Program in Clinical Medicine and ²Department of Radiology, Faculty of Medicine, Public Health, and Nursing, Gadjah Mada University, Special Region of Yogyakarta, Indonesia

ABSTRACT

Background: Low back pain (LBP) is a leading cause of global disability, with intervertebral disc degeneration as a major contributor. This degeneration involves structural and biochemical changes, typically seen on MRI as reduced disc height and T2 signal. The Pfirrmann classification is subjective, whereas the Disc Height Index (DHI) provides an objective measure. This study aimed to evaluate the correlation between DHI and the Pfirrmann classification in patients with LBP.

Methods: This cross-sectional observational study used retrospective data from LBP patients who underwent lumbar MRI at Dr. Sardjito General Hospital, Yogyakarta, between January 2023 and December 2024. Fifty consecutive patients aged 41–70 years, with no history of trauma, infection, tumor, or spinal surgery, were included. MRI data were analyzed to assess DHI and Pfirrmann classification. Interobserver reliability was evaluated using the Intraclass Correlation Coefficient (ICC) and Cohen’s Kappa. Correlation analysis was performed using Pearson or Spearman tests according to data distribution.

Results: The study included 50 patients (mean age 53.9 years; 62.0% female). Mean DHI values across lumbar segments ranged from 0.13 to 0.15. Most L3–4, L4–5, and L5–S1 segments showed Pfirrmann grades 3–4, while L1–2 and L2–3 segments were more evenly distributed, predominantly grades 2–3. The analysis revealed a moderate negative correlation between DHI and Pfirrmann classification in the L1–2 ($p = 0.006$; $r = -0.384$) and L5–S1 ($p = 0.035$; $r = -0.300$) segments, as well as a strong negative correlation in the L2–3 ($p < 0.001$; $r = -0.540$), L3–4 ($p < 0.001$; $r = -0.642$), and L4–5 ($p < 0.001$; $r = -0.523$) segments.

Conclusion: A moderate negative correlation was observed between the Disc Height Index and intervertebral disc degeneration based on the Pfirrmann classification at the L1–2 and L5–S1 segments, whereas a strong negative correlation was found at the L2–3, L3–4, and L4–5 segments on lumbar MRI in patients with low back pain.

Keywords: Low back pain; Disc Height Index; Pfirrmann classification; Lumbar MRI; Intervertebral disc degeneration