

## KORELASI UKURAN LUMBAL SAGITTAL BALANCE AXIS DENGAN DERAJAT HERNIA NUKLEUS PULPOSUS PADA PEMERIKSAAN MRI LUMBAL

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### INTISARI

**Background and Objective.** Hernia nukleus pulposus merupakan suatu keadaan dimana annulus fibrosus beserta nukleus pulposusnya menonjol ke dalam kanalis spinalis. Herniasi paling sering terjadi pada kolumna vertebralis yang lebih sering bergerak yaitu daerah lumbosakral dan servikothorakal, hampir 90 % kasus HNP mengenai diskus intervertebralis L5-S1 dan L4-L5 dengan arah herniasi yang paling sering adalah posterolateral. Vertebra lumbalis adalah bagian vertebrae yang paling banyak menyangga berat tubuh dan stress biomekanik yang berhubungan dengan tulang belakang. Hampir 75% berat badan disangga oleh sendi L5-S1. Kelengkungan normal dan lordosis daerah lumbar mempunyai peran penting dalam menyangga berat badan dan berhubungan dengan terjadinya gangguan pada tulang belakang. Penelitian ini bertujuan untuk mengetahui adanya korelasi antara ukuran *lumbal sagittal balance axis* dengan derajat hernia nucleus pulposus pada pemeriksaan MRI lumbal.

**Objective.** Penelitian ini bertujuan untuk mengetahui adanya korelasi antara sudut *global lumbosacral* dengan derajat hernia nukleus pulposus pada pemeriksaan MRI lumbal. **Materials and Methods.** Penelitian ini menggunakan metode observasional analitik korelasi (*cross-sectional*) pada data sekunder secara retrospektif pada 42 pasien dengan hernia nukleus pulposus yang telah menjalani pemeriksaan MRI Lumbal di bagian radiologi RSUP DR.Sardjito Yogyakarta periode Januari hingga Juni 2022. Pada pasien dilakukan pengukuran *lumbal sagittal balance axis* dan dinilai korelasi antara ukuran *lumbal sagittal balance axis* dengan derajat hernia nukleus pulposus. Hasil penelitian dianalisis menggunakan korelasi Spearman.

**Result.** Pada 42 sampel penelitian didapatkan derajat hernia nukleus terbanyak adalah Protusio atau derajat III sebanyak 17 orang ( 40.5 %), Bulging circumferential atau derajat I sebanyak 14 orang (33.3 %), derajat II ( Bulging asymetrical) sebanyak 1 (2.4 %), derajat IV atau extrusio sebanyak 8 orang (19.0 %) sedangkan untuk Sequester dan Migrasi atau derajat V sebanyak 2 orang ( 4.8 %). Hasil penelitian menunjukkan ada hubungan yang bermakna antara ukuran *lumbal sagittal balance axis* dengan derajat hernia nucleus pulposus dengan  $p=0,011$  dan koefisien korelasi 0,592, semakin besar hasil ukuran *lumbal sagittal balance axis* semakin tinggi derajat hernia nukleus pulposus. Tidak Hubungan yang bermakna antara antara umur, IMT, jenis kelamin, komponen stabilitas pasif maupun aktif dengan derajat HNP ( $p>0,05$ ).

**Conclusion.** Terdapat korelasi positif antara *ukuran lumal sagittal balance axis* dengan derajat hernia nukleus pulposus tetapi tidak terdapat hubungan bermakna antara umur, IMT, jenis kelamin, komponen stabilitas pasif maupun aktif dengan derajat HNP.

**Key words:** Lumbal sagittal balance axis, HNP, Correlation, MRI Lumbal

## CORRELATION OF SIZE OF THE LUMBAL SAGITTAL BALANCE AXIS WITH THE DEGREE OF HERNIA NUCLEUS PULPOSUS ON LUMBAL MRI EXAMINATION

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### ABSTRACT

**Background and Objective.** Hernia nucleus pulposus is a condition in which the annulus fibrosus and its nucleus pulposus protrude into the spinal canal. Herniation most often occurs in the vertebral column which moves more frequently, namely the lumbosacral and cervicothoracic regions, almost 90% of cases of HNP involve the L5-S1 and L4-L5 intervertebral discs with the most frequent direction of herniation being posterolateral. The lumbar vertebrae are the vertebrae that support the most body weight and biomechanical stress associated with the spine. Nearly 75% of body weight is supported by the L5-S1 joints. Normal curvature and lordosis of the lumbar region have an important role in weight support and are associated with spinal disorders. This study aims to determine the correlation between the size of the lumbar sagittal balance axis with the degree of hernia nucleus pulposus on lumbar MRI examination.

**Objectives.** This study aims to determine the correlation between size of lumbal sagittal balance axis and the degree of hernia nucleus pulposus on lumbar MRI examination.

**Materials and Methods.** This study used a correlation analytic observational method (cross-sectional) on secondary data retrospectively on 42 patients with hernia nucleus pulposus who had undergone lumbar MRI examinations at the radiology department of RSUP DR. Sardjito Yogyakarta period January to June 2022. Lumbar sagittal balance axis measurements were performed on patients and assessed the correlation between the size of the lumbar sagittal balance axis with the degree of hernia nucleus pulposus. The results of the study were analyzed using Spearman's correlation.

**Result.** In 42 research samples, the highest degree of nuclear hernia was Protusio or degree III as many as 17 people (40.5%), circumferential bulging or degree I as many as 14 people (33.3%), degree II (asymmetrical bulging) as much as 1 (2.4%), degree IV or extrusion as many as 8 people (19.0%) while for Sequester and Migration or degree V as many as 2 people (4.8%). The results showed that there was a significant relationship between the size of the lumbar sagittal balance axis and the degree of herniation of the nucleus pulposus with  $p=0.011$  and a correlation coefficient of 0.592. No Significant relationship between age, BMI, gender, passive and active stability components and the degree of HNP ( $p>0.05$ ).

**Conclusion.** There is a positive correlation between the size of the lumbal sagittal balance axis and the degree of hernia nucleus pulposus but there is no significant relationship between age, BMI, gender, passive and active components of stability and the degree of HNP.

**Key words:** Lumbal sagittal balance axis, HNP, Correlation, MRI Lumbal