

# Hubungan Kadar Vitamin D, Kadar Reseptor Vitamin D Dan Kadar Aggrecan Serum Terhadap Derajat Keparahan Lumbar Degenerative Disc Disease (LDDD) Pada Usia Dewasa = The Relationship of Vitamin D Levels, Vitamin D Receptor Levels, and Serum Aggrecan Levels with the Severity of Lumbar Degenerative Disc Disease (LDDD) in Adults

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## Abstrak

Lumbar Degenerative Disc Disease (LDDD) adalah salah satu penyebab utama nyeri punggung bawah pada populasi dewasa. Vitamin D, reseptor vitamin D (VDR), dan aggrecan serum memiliki peran dalam patogenesis degenerasi diskus. Penelitian ini bertujuan untuk mengevaluasi hubungan antara kadar serum vitamin D, reseptor vitamin D, dan aggrecan dengan derajat keparahan LDDD pada populasi dewasa. Penelitian ini menggunakan desain cross-sectional dengan 85 subjek usia dewasa yang didiagnosis LDDD. Kadar serum vitamin D, VDR, dan aggrecan diukur menggunakan metode enzyme-linked immunosorbent assay (ELISA). Derajat keparahan LDDD ditentukan berdasarkan Klasifikasi Pfirrmann melalui pencitraan MRI. Data dianalisis menggunakan uji statistik Chi-square, ROC, dan korelasi Pearson atau Spearman. Terdapat hubungan signifikan antara kadar vitamin D dengan derajat keparahan LDDD ( $p=0,01$ ), dengan subjek yang memiliki kadar vitamin D insufisiensi lebih cenderung mengalami LDDD sedang. Sebaliknya, kadar aggrecan menunjukkan hubungan negatif yang signifikan dengan derajat LDDD ( $p<0,001$ ), di mana kadar aggrecan yang lebih rendah berkorelasi dengan keparahan LDDD yang lebih tinggi. Tidak ditemukan hubungan signifikan antara kadar VDR dan keparahan LDDD ( $p=0,492$ ). Penelitian ini menunjukkan adanya hubungan signifikan antara kadar vitamin D dan aggrecan serum dengan derajat keparahan LDDD pada populasi dewasa. Kadar aggrecan yang rendah dan insufisiensi vitamin D berhubungan dengan LDDD yang lebih berat, sedangkan VDR tidak menunjukkan hubungan yang signifikan.

.....Lumbar Degenerative Disc Disease (LDDD) is a leading cause of low back pain (LBP) in the adult population. Serum vitamin D, vitamin D receptor (VDR), and aggrecan are believed to play roles in the pathogenesis of disc degeneration. This study aims to evaluate the relationship between serum levels of vitamin D, VDR, and aggrecan with the severity of LDDD in adults. A cross-sectional study was conducted with 85 adult subjects diagnosed with LDDD. Serum levels of vitamin D, VDR, and aggrecan were measured using enzyme-linked immunosorbent assay (ELISA). The severity of LDDD was graded using the Pfirrmann classification via MRI imaging. Statistical analyses were performed using Chi-square tests, ROC analysis, and Pearson or Spearman correlation. A significant association was found between vitamin D levels and the severity of LDDD ( $p=0.01$ ), with subjects having insufficient vitamin D levels more likely to experience moderate LDDD. In contrast, aggrecan levels showed a significant negative association with LDDD severity ( $p<0.001$ ), where lower aggrecan levels correlated with higher LDDD severity. No significant relationship was observed between VDR levels and LDDD severity ( $p=0.492$ ). This study demonstrates a significant relationship between serum vitamin D and aggrecan levels with the severity of LDDD in adults. Low aggrecan levels and vitamin D insufficiency are associated with more severe LDDD, while VDR levels showed no significant association.