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Distribution of serum 25 (OH) vitamin D levels among body mass index categories in patients with lower back pain associated with lumbar disc herniation

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Background: Low Back Pain (LBP) associated with Lumbar Disc Herniation (LDH) is known as the commonest musculoskeletal disorder globally. Vitamin D deficiency and increased Body Mass Index (BMI) are considered as contributing factors for musculoskeletal disorders and LBP associated with LDH. Vitamin D plays a role in many neurological and muscular functions whereas increased BMI has a mechanical role in LBP associated with LDH.

Objective: To investigate vitamin D levels in patients with LDH (cases) and controls and to study the association of vitamin D with BMI among cases and controls.

Method: Cases (n=104) were individuals with LBP and confirmed for LDH. Controls were those without a previous history of LBP and had not received medication for LBP during the past one month (n=104). Nutritional details were recorded by a validated questionnaire. BMI was calculated with measured height and weight (kgm⁻²). Vitamin D levels were determined by Enzyme Linked Immunosorbent Assay.

Results: Cases (20.5±4.3 ng/mL) showed significantly low (p<0.001) vitamin D levels when compared to controls (25.5±8.3 ng/mL). Most cases (76.4%) were in obese (n=56) and overweight (n=12) category which showed a significant difference (p=0.001) among BMI categories between cases and controls. Obese cases showed decreased serum vitamin D (20.4±4.1 ng/mL) compared to other BMI categories in cases. However, there was no significant difference in vitamin D levels among BMI categories in both study groups.

Conclusion: LBP related to LDH could be attributed to low vitamin D levels in the cases. Increased BMI in cases is an additional contributing factor for mechanical overload in vertebral column which also triggers LBP associated LDH. Higher BMI was found to be associated with low vitamin D levels in cases suggestive of increased vitamin D storage in adipose tissue. However, interplay with BMI and vitamin D levels in patients with LDH should be further investigated.

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