

## Hypovitaminosis D and Cervical Disk Herniation among Adults Undergoing Spine Surgery

**Study Design** Single-center, retrospective study.

**Objective** Suboptimal concentrations of vitamin D have been linked to hip and knee osteoarthritis in large, population-based cohort studies. We sought to examine the association of vitamin D levels with intervertebral disk disease.

**Methods** From January 2010 through May 2011, 91 consecutive, eligible adult spine surgery patients who had undergone cervical magnetic resonance imaging (MRI) and preoperative serum 25-hydroxyvitamin D (s25D) measurement were retrospectively included. MRI was read for C2–T1 disk herniation and degeneration (grades I to V). Logistic regressions were performed.

**Results** Compared with the 384 disks of nondeficient patients, 162 disks of vitamin D-deficient (< 20 ng/mL) patients were more frequently herniated (40% versus 27%,  $p = 0.004$ ); deficiency was not predictive of individual disk grade (unadjusted odds ratio [uOR] = 0.98,  $p = 0.817$ ). On regression analysis, deficiency was associated with increased number of herniations per patient (uOR = 2.17, 95% confidence interval [CI] = 1.22 to 3.87,  $p = 0.009$ ; adjusted odds ratio [aOR] = 2.12, 95% CI = 1.11 to 4.03,  $p = 0.023$ ). When disks were analyzed individually, and levels (e.g., C5 to C6), additionally controlled for, deficiency correlated with greater likelihood of herniation per disk (uOR = 1.81, 95% CI = 1.22 to 2.66,  $p = 0.003$ ; aOR = 2.06, 95% CI = 1.25 to 3.41,  $p = 0.005$ ).

**Conclusion** Among adults undergoing spine surgery at our institution, vitamin D deficiency was associated with cervical disk herniation. Considering the current epidemics of vitamin D insufficiency and neck pain, further investigation is warranted, as these data were retrospectively collected and subject to sampling bias.

## 成人維生素 D 缺乏和頸椎椎間盤突出症接受脊椎手術

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**目的** 在大型，以人口為基礎的隊列研究中，次優濃度的維生素 D 已是與髖關節和膝關節骨關節炎有關聯。我們試圖探討維生素 D 水平與椎間盤疾病的關係。

**方法** 由 2010 年 1 月至 2011 年 5 月，91 個連續，符合資格的成年脊柱手術的患者，他們都進行了頸椎磁力共振成像 (MRI) 和術前血清 25-羥維生素 D (S25D) 的測量，他們都回顧性地包括在此研究內。MRI 是被檢閱了 C2 -T1 椎間盤突出和退變 (等級 I 到 V)。進行了羅吉斯迴歸。

**結果** 與 384 個沒有不足的患者的比較，162 個缺乏維生素 D (< 20 毫微克/毫升) 患者的椎間盤更頻繁地突出 (40 % 對 27 %， $P = 0.004$ )；缺乏是不能預測個別椎間盤的級別 (未調整勝算比 [uOR] = 0.98， $P = 0.817$ )。在迴歸分析中，缺乏是與每名患者增加的突出數量有關 (uOR = 2.17，95 % 可信區間 [CI] = 1.22 至 3.87， $P = 0.009$ ；調整後勝算比 [aOR] = 2.12，95 % CI = 1.11 至 4.03， $P = 0.023$ )。當椎間盤被單獨分析，並控制了節段 (例，C5 至 C6)，缺乏與每個椎間盤突出的關連有更大的可能性 (uOR = 1.81，95 % CI = 1.22 至 2.66， $P = 0.003$ ；aOR = 2.06，95%CI = 1.25 至 3.41， $P = 0.005$ )。

**結論** 在我們的學院接受脊椎手術的成年人，維生素 D 缺乏與頸椎椎間盤突出症是有關聯的。考慮到維生素 D 不足令頸部疼痛的次數增加，進一步的研究是必要的，因為以上這些資料只是進行回顧性收集並受抽樣偏差。