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研究課題名(和文) ビタミンD不足症の運動器障害・要介護に及ぼす影響の解明：大規模住民コホートの追跡

研究課題名(英文) Vitamin D insufficiency and the occurrence of musculoskeletal diseases and disability: A population-based cohort ROAD

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研究成果の概要(和文)：一般住民の追跡調査結果から、わが国においてはビタミンD(VD)欠乏症の有病率は1.2%と低かったが、VD不足症の有病率は81.3%と極めて高いことがわかった。また血清25D値は将来の骨粗鬆症の発生を予測しうるが、変形性関節症の発生とは関連を認めないことがわかった。次に3年後の追跡調査で血清25D値の変化率(標準偏差)をみると、7.6(13.3)%/年となり、全体として増加傾向にあることがわかった。多変量解析の結果、25Dの変化率はベースライン調査時の骨密度やエネルギー摂取量に影響されることがわかった。これにより25Dの低値の頻度とその変化、VD不足の予防に有用なエビデンスを得た。

研究成果の概要(英文)：In this population-based cohort study, assessments of serum 25-hydroxyvitamin D (25D) levels revealed vitamin D insufficiency and deficiency at prevalences of 81.3% and 1.2%, respectively. Serum 25D levels could predict the occurrence of osteoporosis within 3 years, but not the occurrence of osteoarthritis. The mean (SD) annual change in the serum 25 D levels was 7.6 (13.3) %/year, which tended to increase during the 3-year period. Multivariate regression analysis indicated that the L2-4 bone mineral density and total daily energy intake were significant independent associated factors.

研究分野：疫学

キーワード：医療・福祉 ビタミンD不足 骨粗鬆症 変形性関節症 要介護 危険因子 コホート調査

1. 研究開始当初の背景

カルシウム代謝を介したビタミン D (VD) の骨粗鬆症(OP)への影響については多くの知見が得られているが、最近では他の運動器疾患とVDの関連について検討した報告も散見されるようになってきた。しかし今のところ、わが国においてはVD不足症についての報告自体が乏しく、VDとこれら運動器障害との関連や、VD値の変化を明らかにした報告はほとんどない。

2. 研究の目的

大規模住民コホート研究ROAD studyのデータを用いて、一般住民におけるVD不足症、VD欠乏症の頻度を明らかにすると同時に、OPをはじめとする運動器疾患との関連、およびVDの変化を明らかにすることを目的とした。

3. 研究の方法

対象は大規模住民コホート研究ROAD study対象者の中で、和歌山県の山村と漁村に設定したコホート参加者1,690人(男性596人、女性1,094人、平均年齢65.2歳)である。対象者にはベースライン調査時に栄養調査、身体測定を行い、血清iPTHおよび25-hydroxyvitamin D (25D)を測定した。血清25D値が10ng/mL未満をVD欠乏症、10ng/mL以上30ng/mL未満をVD不足症と定義した。次に3年後の追跡調査時に凍結保存したサンプルを用いて血清25Dを再度測定した。同対象者には、ベースライン調査と追跡調査いずれにおいても、OP、変形性関節症(OA)の判定に必要な骨密度検査、X線検査を行った。

4. 研究成果

ベースライン調査参加者の血清25Dの平均値(標準偏差)は23.3(6.6)mg/mL(男性25.7(6.5)ng/mL、女性22.0(6.2)ng/mL)であり、女性に有意に低かった($p < 0.001$)。年代別にみると、女性の40歳代の平均値が他の年代に比して低い傾向にあった($p < 0.01$)が、他の年代では差異はなかった。VD欠乏症の有病率は1.2%(男性0.3%、女性1.7%)と低かったが、VD不足症の有病率は81.3%(男性72.1%、女性86.3%)と高かった。VD欠乏症、不足症とも女性に多い傾向にあった($p < 0.001$)が、年代による差はなかった。

3年間の追跡において、OPの累積発生率を推定したところ、腰椎L2-4で0.76%/年、大腿骨頸部では1.83%/年となり、大腿骨頸部の方が高かった。一方変形性膝関節症(KOA)の累積発生率は3.3%/年、変形性腰椎症(LS)の累積発生率は11.4%/年となった。多変量解析において、性、年齢、地域、およびその他の交絡因子を調整して血清25Dが運動器疾患に及ぼす影響を検討したところ、血清25Dが1SD上昇すると大腿骨OPの発生率が有意に低下していた(+1 SD; odds ratio, 0.67; 95% confidence interval, 0.49-0.92; $p = 0.014$)。一方

腰椎L2-4やKOA、LSとは有意な関連を示さなかった。これより、血清ビタミンD低値はOP発生(大腿骨)を予測しうるが、変形性関節症とは関連を認めないことが明らかになった。次に、3年後の追跡調査で血清25D値の変化率(標準偏差)をみると、7.6(13.3)%/年となり、全体として増加傾向にあることがわかった。25Dの増加に影響を及ぼす要因を多変量解析で検討すると、ベースライン調査時の腰椎L2-4骨密度が高いほど($p=0.05$)、エネルギー摂取量が多いほど($p=0.04$)、変化率が高くなっていった。

今回の一般住民の追跡調査結果から、わが国においてはVD欠乏症の有病率は低い、VD不足症の有病率は極めて高いことがわかった。また血清25D値は将来のOPの発生を予測しうるが、変形性関節症の発生とは関連を認めないことがわかった。次に血清25D値は全体として増加傾向にあり、ベースライン調査時の骨密度やエネルギー摂取量に影響されることがわかった。これにより、25Dの低値の頻度とその変化、VD不足の予防にとって有用なエビデンスを得た。

5. 主な発表論文等

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- 〔産業財産権〕
- 出願状況 (計 0 件)
 - 取得状況 (計 0 件)
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