The diagnostic criteria of McGeer[4] would have detected 16 of the 37 cases of bacteremia in patients aged 75 and older (a false negative rate of 56.8%). The criteria of Loeb[5,6] had a false negative rate of 43.2% (21 of 37 cases correctly identified).

DISCUSSION

The finding that only approximately half of elderly patients with UTI have any urinary tract symptoms is consistent with previous studies.[3,9] Nonspecific declines in function or symptoms suggesting a respiratory origin have previously been associated with bUTI in older adults.[9] Despite proven bacteremia, 8.1% of patients aged 75 and older did not have even mild pyrexia (>37.0°C) at any stage of their illness. Twenty-seven percent of patients aged 75 and older did not reach the more stringent criteria of a temperature greater than 37.9°C. Previous studies of bUTI have also found that 37% to 49% of older patients do not have significant pyrexia at the time of presentation.[7,9] The observed mortality rate of 27% in the group aged 75 and older is similar to that reported in other studies (15–33%).[3,7,8] None of the schemes evaluated against the data in this series showed reliable sensitivity to detect bUTI in a hospitalized patient group.

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ASSOCIATION BETWEEN SERUM 25-HYDROXYVITAMIN D CONCENTRATIONS AND VISION: A CROSS-SECTIONAL POPULATION-BASED STUDY OF OLDER ADULTS

To the Editor: Vitamin D is a secosteroid hormone that has exhibited multiple biological targets.[1,2] Low serum 25-hydroxyvitamin D (25OHD) concentrations are frequent in older adults, with a prevalence reaching 90%, and have been associated with several nonbone adverse health outcomes.[1–3] Impaired vision is highly prevalent in older adults and affects functional abilities, risk of falls, and quality of life.[4] Several conditions can impair vision in older adults, but the most common cause of visual loss in the aging Western population is age-related macular degeneration (AMD).[4,5] A study recently showed, using fundus photography analysis, that low serum 25OHD concentrations were associated with early AMD, although visual function was not assessed in the studied population.[5] The aim of the current study was to examine the association between visual function and serum 25OHD concentrations in a French community-dwelling population aged 65 and older.

Three hundred eleven adults (mean age 71.7 ± 5.5, 39.9% female) were consecutively included in this cross-sectional study between June 2009 and October 2009. All subjects were recruited during a free medical examination at the health examination center of Lyon, France. All subjects gave informed consent according to the ethical standards set forth in the Declaration of Helsinki (1983). Height, weight, and number of drugs taken each day were recorded. Body mass index (BMI) was calculated as kg/m^2. Binocular visual acuity was measured at 5 m using a standard Monoyer letter chart, with the current best corrected glasses of included subjects if normally worn, and the result was expressed in LogMar values (higher score corresponding to worse vision).[6] Fasting early-morning venous blood was collected from resting subjects for measurement of serum 25OHD. Serum concentrations of 25OHD were measured using radioimmunoassay (Incstar Corp., Stillwater, MN). The following previously established cutoff points were used to categorize subjects into three groups: severe 25OHD insufficiency (<10 ng/mL), moderate 25OHD insufficiency (10–29 ng/mL), and normal concentrations (≥ 30 ng/mL).[7] Comparisons between groups were performed using one-way analysis of variance, the Kruskal-Wallis test, or the chi-square test, as appropriate. Multiple linear regression analyses were performed to specify the association between binocular distance vision score (dependent variable) and serum 25OHD (independent variable) adjusted for subjects' baseline characteristics (age, sex, BMI, and number of drugs). $P < .05$ was considered to be statistically significant. All statistics were performed using SPSS (version 17.0, SPSS, Inc., Chicago, IL).

Severe 25OHD insufficiency was found in 17.7% (n = 55) of the studied sample, moderate insufficiency in 69.8% (n = 217), and normal concentrations in 12.5% (n = 39). Subjects with severe 25OHD insufficiency (mean

Table 1. Multiple Linear Regression Models Showing the Association Between Binocular Distance Vision Score (Dependent Variable) and Serum 25-Hydroxyvitamin D (25OHD) Concentrations (Independent Variable) Adjusted for Clinical Characteristics (N = 311)

	β (95% Confidence Interval) *P*-Value	
Variable	**Fully Adjusted Model**	**Stepwise Backward Model**
Serum 25OHD concentration	− 0.004 (− 0.006 to − 0.002) .001	− 0.003 (− 0.005 to − 0.002) .001
Age	0.012 (0.008 to 0.016) ≤ .001	0.013 (0.008 to 0.017) < .001
Female	− 0.001 (− 0.042 to 0.040) 0.975	—
Number of drugs	0.008 (0.000 to 0.016) 0.060	—
Body mass index	− 0.004 (− 0.009 to 0.001) 0.165	—

β = coefficient of regression beta corresponding to an increase or a decrease in binocular distance vision acuity.

age 72.4 ± 5.2) were older than those with moderate insufficiency (mean age 71.9 ± 4.4; $P = .03$) and those with normal concentrations (mean age 69.8 ± 3.5; $P = .02$). BMI was higher in subjects with severe 25OHD insufficiency (27.3 ± 5.3 kg/m^2) than in those with normal concentrations (24.9 ± 3.0 kg/m^2; $P = .01$). In addition, subjects with severe 25OHD insufficiency had a lower mean distance vision score (0.24 ± 0.24) than those with moderate insufficiency (0.14 ± 0.18, $P = .002$) and those with normal concentrations (0.11 ± 0.12, $P = .002$). The fully adjusted and stepwise backward linear regression models highlighted that distance vision score was negatively associated with serum 25OHD concentrations ($P = .001$) and positively associated with age ($P < .001$).

These results showed that low serum 25OHD concentrations were associated with poorer vision acuity. These findings are in concordance with a previous study that showed that serum vitamin D was inversely associated with AMD.[5] Because AMD is the most common cause of impaired visual acuity in older adults,[4] it could be inferred that in the elderly population in the current study, there was an association between low serum 25OHD and low visual acuity related to AMD. As an explanation, vitamin D immunoregulation properties, as well as its involvement in blood pressure control, could influence the natural history of AMD in the case of hypovitaminosis D. Not only the accumulation of retinal immune cells,[8] but also the existence of an arterial hypertension, which occurs in case of hypovitaminosis D,[9] causes AMD. Last, vitamin D is a neurosteroid hormone involved in trophic function of neural cells, as in the retina, and age-related hypovitaminosis D could contribute to cell degeneration.[1] The main limitation of the current study was its cross-sectional design, making it difficult to determine whether low visual acuity precipitated vitamin D insufficiency or whether vitamin D insufficiency played a role in the genesis of visual loss. Further research, including a detailed ophthalmological evaluation, is needed to corroborate these results.

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