Determination of 25-hydroxy-vitamin D status, serum CrossLaps, and calcium intake in individuals with primary adult-type lactose malabsorption

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INTRODUCTION:
Primary adult-type lactose malabsorption (PALM) is a widespread inherited autosomal recessive condition. It is considered to be associated with osteoporosis. The purpose of the present study was to assess the 25-hydroxy-vitamin D (25[OH]D) status, serum CrossLaps and dairy calcium intake in individuals with PALM (i.e., \textit{LCT C/C/13910} genotype) and normal controls (i.e., \textit{LCT C/T/13910} and \textit{T/T/13910} genotypes). In addition, the height, weight and body mass index (BMI) were determined.

METHODS:
In total, 210 adult individuals, who were referred to our outpatient clinic for PALM testing, were included in this prospective cross-sectional study. All participants underwent genotyping for the \textit{LCT C/T/13910} polymorphism, 25(OH)D and CrossLaps measurements and clinical examinations. Blood sampling was performed after a 12 h overnight fasting in the morning between 8 a.m. and 10 a.m. A researcher-developed questionnaire was used to estimate daily calcium intake from dairy products.

RESULTS:
Fifty-five individuals with PALM (i.e., \textit{LCT C/C/13910} homozygotes) showed lower 25(OH)D (mean: 24.95 10.04 vs. 28.59 9.56 ng/mL, \textit{P} = 0.018) (Figure 1) and higher CrossLaps serum levels (mean: 0.46 0.31 vs. 0.43 0.49 ng/mL, \textit{P} = 0.251) (Figure 2) compared to 155 normal controls (i.e., \textit{LCT C/T/13910} hetero- or \textit{T/T/13910} homozygotes). Moreover, 26/55 (47.27\%) \textit{LCT C/C/13910} homozygotes reported to be lactose intolerant compared to 31/155 (20.0\%) normal controls (\textit{P} < 0.001). Total daily calcium intake (mean: 303 162 vs. 330 194 mg per day, \textit{P} = 0.463) and anthropometric data were similar between PALM probands and controls (Table 2).

CONCLUSION:
In conclusion, individuals with PALM were found to have lower 25(OH)D and higher CrossLaps serum levels compared to individuals with lactase-persistence. Based on these findings, we suggest to perform routine 25(OH)D and CrossLaps serum measurements in individuals with PALM. The determination of these biomarkers may contribute to the preservation of lifelong bone health.