

# Measurement of Plasma 25-Hydroxyvitamin D Levels Requires Consideration of Ultraviolet Exposure From Sunlight

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It was with great interest that we read the article entitled “Analysis of the Role of Plasma 25-Hydroxyvitamin D Levels in Survival Outcomes in Patients from the Phase III MPACT Trial of Metastatic Pancreatic Cancer” by Von Hoff et al,<sup>1</sup> who investigated the relationship between plasma 25-hydroxyvitamin D [25(OH)D] levels and survival in patients with pancreatic cancer. The results found no statistical correlation between plasma 25(OH)D levels and overall survival of pancreatic cancer patients. This is an impressive study, and we applaud the authors for their efforts. However, there are several issues with the methodology of the study that deserves to be raised.

As we all know, 7-dehydrocholesterol in human skin can be converted to vitamin D under the irradiation of ultraviolet (UV) light from sunlight, which is the main way for the human body to obtain vitamin D.<sup>2-4</sup> The synthesized vitamin D is then transported to the liver where it is transformed into 25(OH)D by the action of 25-hydroxylase in the endoplasmic reticulum and mitochondria of hepatocytes.<sup>5</sup> Thus, exposure to UV light from sunlight outdoors, including the duration and intensity of UV irradiation, influences plasma 25(OH)D levels. The outdoor activity time of patients should be investigated by questionnaires. UV intensity in sunlight is seasonally and geographically dependent, the authors considered the geographical factor but not the seasonal factor in this study. A study has shown that human serum 25(OH)D levels fluctuate with the seasons, with lower 25(OH)D levels in the winter and early spring seasons.<sup>6</sup> Therefore, to correct for the effect of season on patients' plasma 25(OH)D levels, a cosinor model is recommended to calculate seasonally normalized 25(OH)D concentrations to obtain season-adjusted plasma 25(OH)D measurements.<sup>7,8</sup> Moreover, UV exposure is related to skin color because melanin in the skin has a sun-protective effect, and the darker the skin color the less UV exposure. Skin color varies by race, so race should be included in the baseline characteristics to compare the differences in plasma 25(OH)D levels between different groups of patients. In addition to UV radiation from sunlight, food can also provide small amounts of vitamin D to the human body, and the vitamin content of different types of food varies widely.<sup>9</sup> Therefore, dietary structure should be considered as an important factor influencing plasma 25(OH)D levels. We suggest that the authors adopt a questionnaire to

investigate the amount and type of dietary intake of patients in a future study.<sup>10</sup>

## Conflict of Interest

The authors indicated no financial relationships.

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Received: July 29, 2021. Editorial Acceptance: September 23, 2021.

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