Educational Discussion: Bone Markers and Vitamins

2016-A Bone Markers and Vitamins Survey (BMV)

The 2016 BMV-A Survey comprised various challenges encompassing a continuation of the previously established analytes for this Survey. However, an additional challenge was included for this 1,25 Dihydroxy Vitamin D Survey. The additional educational challenge, ABVD-05, was material from the Accuracy Based Vitamin D Survey (ABVD). The sample was composed of pooled off-the-clot, fresh frozen serum obtained from several donors. In collaboration with the National Institutes of Health (NIH) Vitamin D Standardization Program, samples in the College of American Pathologists (CAP) ABVD Survey were demonstrated to be commutable and fit-for-purpose for proficiency testing of LC-MS/MS assays and all clinical assays that were tested for the quantification of total vitamin D concentrations in human serum samples. Results are provided in the 2016 BMV-A participant summary by measurement procedures used by participating laboratories. There is not a reference target value for 1,25 Dihydroxy Vitamin D, ABVD-05. However, mass spectrometry was used by some laboratories participating in this Survey.

In most clinical settings, measurement of total 25-hydroxy vitamin D provides an adequate assessment of vitamin D stores. Measurement of 1,25-dihydroxy vitamin D, which is the most active form, is ordered typically as a second-order or follow-up test, especially in patients with renal disease. In the presence of renal disease, 1,25-dihydroxy vitamin D levels may be needed to adequately assess vitamin D status. It is needed only rarely clinically. Reference intervals for 1,25-dihydroxy vitamin D are generally wide. However, accurate and precise measurements are required for the assessment of Vitamin D status in these rare clinical scenarios.

TABLE 1.

ABVD-05	n	Mean/Median (pg/mL)	Low (pg/mL)	High (pg/mL)	SD/CV%
LC-MS/MS	5	-/39.0	29.0	41.0	-/-
Diasorin Liaison	39	40.88/41.7	24.7	47.2	4.43/10.8
Diasorin RIA	8	-/63.4	50.2	93.3	-/-

Although no formal grading was performed for ABVD-05, participants should compare their results to the peer group as an educational challenge to determine how their method performs when using this commutable matrix. While no significant findings can be attributed to the data in this Survey due to the limited number of labs participating, it is interesting to note the differences observed between the method peer groups (Table 1). The LC-MS/MS and Diasorin Liaison peer groups match well, with only minor differences between the medians and range of results. However, the median and ranges for the Diasorin RIA are nearly double that of the other peer groups. It is unknown whether this difference may be reflected in the established reference intervals for these methods, or if this difference represents a phenomenon related to the differences in methodology. Regardless, the

differences observed with ABVD-05 were not reflective of the differences observed when using BMV1-01 (Table 2). BMV1-01 was another challenge in this same Survey that approximated the 1,25-dihydroxy vitamin D level in ABVD-05. Of note, BMV-01 was not prepared using the ABVD Survey material. In fact, in this challenge, the Diasorin RIA median and range of results were nearly half that of the other peer groups, compared to double in the ABVD-05 challenge. The medians and range of results for the LC-MS/MS and Diasorin Liaison peer groups again match well.

TABLE 2.

BMV1-01	n	Mean/Median (pg/mL)	Low (pg/mL)	High (pg/mL)	SD/CV%
LC-MS/MS	5	-/47.0	38.0	49.0	-/-
Diasorin Liaison	39	54.23/53.9	46.7	65.4	4.19/7.7
Diasorin RIA	8	-/21.0	5.7	26.9	-/-

The purpose of these comparisons with the ABVD-05 sample is to show you whether observed differences are local to your laboratory or are also seen by other users of your method. It can be speculated that the use of the ABVD-05 sample in this Survey highlights the importance of accuracy based sample matrices.

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