Discussion

This represents the initial Survey for Accuracy-Based Urine Albumin, and, as such, it's not terribly surprising that we encountered a problem. Although we asked participants to report their albumin results ONLY in mg/dL (and provided the conversion factor for those who typically use mg/L), it became apparent on reviewing the submitted data that 13 (of the 56) labs reporting albumin failed to do the conversion – their results were off by a factor of 10.

CAP policy, consistent with its role as Proficiency Testing provider, does not allow us to change participants' submitted results, so the Participant Summary Report summarizes the data as submitted, which, in the case of albumin, makes precision and accuracy statistics versus the reference value look considerably worse than it really is. For that reason, we re-analyzed the data below to provide what we believe is a much better assessment of actual performance on this Survey.

Of note, going forward, we will allow participants to use either mg/L or mg/dL for their urine albumin results. We will ask that they provide their answers in their usual units of measurement but also indicate which of the two units they use by filling in a "bubble" on the result form.

The three urine samples in this Survey are real human urine samples, collected fresh, and pooled to achieve clinically relevant urine albumin concentrations. The target values were determined on these samples by a well-respected reference laboratory using the reference method (mass spectrometry), thus allowing us all to see how closely our routine measurements match those reference values. In the case of urine albumin, where the National Kidney Disease Education Program (NKDEP) has established decision limits for determining normal versus "microalbuminuria" versus "macroalbuminuria" [(1)], it is critical that laboratories know that their albumin measurements are accurate (i.e., that they match the reference method value on commutable samples). In contrast, traditional proficiency testing materials may suffer from matrix effects [(2)], so comparisons are typically done by peer group.

As noted above, there was some confusion about units of measure. When we eliminated results from the 13 laboratories whose results appeared to be in mg/L or converted those results into mg/dL, we found comparable statistics, so we chose to provide the former. For ease of comparison in the table below, we list the statistics from the PSR as well:

		no correction for mg/L (reflected in PSR statistics)			mg/L results converted to mg/dL			alb/creat
	target	mean	SD	CV	mean	SD	CV	mg/g
ABU-01	3.65	10.01	12.60	125.9%	3.19	0.266	8.3%	59
ABU-02	1.63	3.95	5.04	127.8%	1.23	0.199	16.2%	14
ABU-03	18.44	49.48	61.70	124.7%	16.06	1.173	7.3%	233

In marked contrast to the PSR data in the accompanying report (columns 3 through 5), the converted data (columns 6 through 8) shows excellent performance, both in agreement with the reference values and overall inter-laboratory precision. (Note that the high CV for sample ABU-02 in column 8 is related to an exceptionally low mean value.)

To put these absolute values into perspective, we can look at the corresponding albumin/creatinine ratio values (last column to right). Recall that the cut-points for "microalbuminuria" and "macroalbuminuria" are 30-300 mg/day and >300 mg/day (corresponding to albumin/creatinine ratios (mg/g) of 30-300 and >300). As shown in the last column in the table above, the albumin/creatinine values on these samples were relatively low range microalbuminuria, normal, and relatively high range microalbuminuria, respectively.

For our first iteration of this Survey, we are very pleased with the range of values reflected in the samples and, even more so, with the excellent performance of our participants. These samples, two of which had extremely low values, were quite challenging.

References

1) National Kidney Disease Education Program, Quick Reference on Urine Albumin Creatinine Ratio and Estimated GFR: http://www.nkdep.nih.gov/resources/quick-reference-uacr-gfr.shtml (Last accessed July 28, 2013)

2) Miller WG, Jones GR, Horowitz GL, Weykamp C. Proficiency testing/external quality assessment: current trends and future directions. Clin Chem 2011;57:1670-1680.

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