Use of WHO C1q Standard Improves the Concordance of C1q Study Results Between different Laboratories

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RESULTS AND DISCUSSION

First, we compared 29 pairs of serum/plasma C1q test results. Data is shown in Figure 1. Deming regression analysis showed that there is no correlation between serum and plasma samples (slope 0.383 with 95% confidence interval not including 1 and intercept 130 µg/mL with 95% confidence interval not including 0). C1q concentrations in sera were generally higher than they were in plasma (90 % of the cases). The average C1q serum-to-plasma ratio was 1.17. A possible explanation of the differences in C1q content in plasma and serum could be complement activation during the clq formation in serum [6-8], which makes serum to be a potentially misleading source of information about blood C1q concentration. Based on these results, EDTA plasma was determined as the most acceptable specimen for C1q assay.

Our C1q RID EDTA plasma validation study revealed the following parameters: data was linear over the measured range from 20 to 296 µg/mL, recovery ranged from 99 % to 110 %, and within-run and between-run precision were within 10 %. Reference interval calculated by transformed parametric estimation was found to be as follows: lower limit - 103 µg/mL; 90 % confidence limits from 104 to 113 µg/mL; upper value - 242 µg/mL; (90 % confidence limits from 227 to 258 µg/mL).

Results of 20 samples tested at Quest, NJHC, and ARUP are shown in Table 1. It includes original data and data expressed in international units (IU) that have been calculated based on C1q WHO Standard values. Comparisons between the 3 labs’ studies showed considerable differences in reported C1q concentrations reference intervals. Concordance greatly improved when all results were expressed in international units based on values for the WHO standard. Differences between lower reference interval values also decreased: CV for the lower reference intervals for Quest, NJHC, and ARUP was 8.3 %, agreement between ARUP and Quest data was 100 %. In NJHC data 5 samples were discordant. Because only deficiency in C1q concentration is clinically important, upper reference intervals were ignored. Two out of 4 “negative” samples (#8 and #19, Table 1) were within 5 % of the reference interval limits and could be marked as equivocal. Considering this, agreement between ARUP and NJHC was 89 %.

CONCLUSIONS

The Binding Site RID assay is an accurate and reliable method for complement C1q concentration measurement. We recommend using only EDTA plasma for C1q assay. Concordance between results from different reference laboratories can be greatly improved using the same WHO C1q Standard.

REFERENCES

5. Human Complement Clq BINDERIDTM Radial Immunodiffusion kit; Product Code: RN020.3, The Binding Site Ltd., Birmingham, UK.