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LETTER TO THE EDITOR

Comparable Serum and Plasma 1,3-β-D-Glucan Values Obtained Using the Wako β-Glucan Test in Patients with Probable or Proven Fungal Diseases

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Here, we report comparable results for the Wako β-glucan test (GT; FUJIFILM Wako Pure Chemical Corporation, Osaka, Japan), recently launched in Europe for testing the invasive fungal disease (IFD) biomarker 1,3-β-D-glucan (BDG) (1–3), in matched serum and plasma samples from patients with IFD. Contrary to the Fungitell assay (FA; Associates of Cape Cod, East Falmouth, MA), which yielded the majority of BDG data in Europe and the United States with serum samples, the Wako GT is currently recommended for use with plasma samples (4). Because of their different detection techniques (colorimetric versus turbidimetric), the cutoffs for BDG measurement are 80 pg/ml for FA and 11 pg/ml for GT, according to the respective manufacturers (3).

However, we acknowledge that serum and plasma are not interchangeable for most biomarker detection assays; moreover, few clinical laboratory studies have to date focused on how BDG concentrations in the serum correlate with those in the plasma. Since GT may be a valuable alternative to the FA, particularly in laboratories with low sample throughput (5), more information on this topic is desirable. Although selecting a serum or plasma sample might depend on the relative benefits of one over the other, the serum remains the preferred sample for fungal antigen testing (6).

As shown in Table 1, we tested one or more pairs of serum and plasma samples ($n = 50$) from patients with candidiasis ($n = 10$), aspergillosis ($n = 5$), and pneumocystosis ($n = 3$), for which an FA-determined BDG-positive result (≥80 pg/ml) was one of the specific diagnostic criteria (7). Using the predefined cutoff value (11 pg/ml), all samples from the three IFDs studied had a positive BDG measurement by the Wako assay. The results indicated that the correlation between serum and plasma was positive, and the overall BDG values were higher in the plasma samples than in the serum samples. In addition, 20 serum and plasma control samples (i.e., obtained from patients without IFD) tested negative by the Wako assay.

Although BDG measurement mainly relies on the *Limulus* amebocyte lysate pathway in both the FA and the GT, they differ methodologically, which is the reason why the BDG concentrations measured by the FA and the GT are not directly comparable. Only once separately, two clinical studies evaluated the diagnostic performances of the FA and the GT using either plasma (8) or serum (5) samples. Interestingly, the similarity of the studies' findings indirectly proved that plasma and serum samples could yield

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TABLE 1 Correlations between serum and plasma Wako GT results for the BDG with seven or more pairs of results

IFD(s) (no. of patients)	No. of samples tested	Median BDG concn (pg/ml) in plasma and serum samples (range)		Pearson correlation	*P*[a]
		Plasma	Serum		
Candidiasis (10)[b]	30	70.1 (14.8–1,633)	41.4 (12.2–1,027)	0.9532	<0.0001
Aspergillosis (5)	13	103.3 (14.8–1,215)	97.0 (14.9–1,256)	0.9906	<0.0001
Pneumocystosis (3)	7	57.2 (14.8–1,215)	50.8 (14.9–1,387)	0.9870	0.0003
All (18)[c]	50	78.2 (14.8–1,633)	54.2 (12.2–1,387)	0.9545	<0.0001

[a]A *P* value of 0.05 was considered significant.
[b]Nine patients had candidemia, and one patient had abdominal candidiasis.
[c]All were proven or probable IFDs. With regard to aspergillosis, one was proven, and four were probable.

comparable results. Our study shows that the Wako GT worked well also with serum samples, and this adds to the fact that the GT, unlike the FA, is applicable for individual, parallel, or sequential testing of samples (5). In conclusion, serum samples are equal to plasma samples when BDG is measured with the Wako GT assay.

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