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Poster Presentation

RELATIVE PERFORMANCE OF WEST NILE VIRUS SEROLOGICAL ASSAYS IN THIRTEEN SEROCONVERSION PANELS (SP415)

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Background:

We previously described the performance of available WNV antibody assays on 98 cross-sectional confirmed viremic donations detected by nucleic acid testing (NAT) during the 2003 WNV epidemic. Conclusions from this initial study were: 1) depending on the assay 85%-90% of the samples were pre-seroconversion; 2) good correlation for 3 of the 4 assays; and 3) main source of discordant results was attributable to isolated IgG reactivity by one assay. These initial results have been extended by the analysis of WNV seroconversion panels presented in this abstract.

Methods:

Thirteen (13) panels were evaluated. The selection criteria were: 1) index specimens were in our original study; 2) index samples were non-reactive for anti-WNV IgM; 3) 1st follow-up specimen was drawn <10 days after index, and 4) there were at least 2 follow-up specimens. Three manufacturers developed both anti-WNV IgM and IgG assays (Focus, Abbott, PANBIO). While the 4th manufacturer developed an assay capturing all anti-WNV antibodies; only IgM antibodies; and an immunoblot assay capturing anti-WNV IgA, IgM, IgG, and antibodies to WNV envelope antigen(s) (Chiron). Testing was performed on coded samples. Confirmation of WNV seroconversion by plaque neutralization (CDC) was performed.

Results:

Analysis of variance models were used to test the hypothesis that a difference was present between assays in the average time from the index sample (i.e. day 0) to the first positive result for either IgM or IgG. One panel never demonstrated complete IgM seroconversion (i.e. result remained equivocal) by one manufacturer (PANBIO). The least biased estimate of PANBIO's IgM assay performance was achieved by setting the day of sero-conversion to 1 day after the last panel member (i.e. 21 to 22 days). For the IgM assays there was a statistically significant difference ($p = 0.0235$); while among the IgG assays none was observed ($p = 0.9654$). The source of the significant difference was between Abbott and PANBIO's assays. The Abbott assay detected the presence of WNV IgM 2.31 days sooner than the PANBIO assay (95% CI: 0.19 and 4.42 days).

Conclusion:

The presence of recurring WNV epidemics and the need to protect recipients of blood transfusions from infection presents a unique opportunity to critically evaluate the natural history of infection among healthy individuals. This can only be achieved if the performance of both WNV NAT and serological assays is critically examined. With our initial evaluation of these WNV serological assays on cross-sectional NAT-reactive cases and the results from this follow-up study, we have critically evaluated all available serological assays.