Comparison between an in-clinic point-of-care assay and the reference method for detecting of equine immunoglobulin G

Key Words : Vcheck, Equine, Foal, IgG, RID, Comparison

BIONOTE study

Introduction

Failure of transfer of passive immunity (FTPI) in foals is associated with a risk of infection and death.[1)] Healthy foals on well-managed farms may have sufficient serum immunoglobulin G (IgG) concentrations ranging from 400 to 800 mg/dL. However, these levels are inadequate for compromised or ill foals, which comprise a significant portion of hospitalized foals. For compromised or ill foals, an IgG concentration of 800 mg/dL is considered adequate. Detection of FTPI in sick or hospitalized foals, therefore, constitutes an important facet of their care.[2)]

Purpose

The aim of this study was to compare the results of equine IgG obtained using Vcheck assay with those obtained using the Radial immunodiffusion (RID) test for Equine IgG (Triple J Farms, Bellingham, WA), which has previously been validated for measurement of equine IgG.[3)]

Materials and Methods

A total of 102 fresh equine whole blood, plasma, and serum samples with varying IgG concentrations were received and used for the purpose of this study conducted by the BIONOTE laboratory. No samples exhibiting heavy hemolysis, lipemia, or other serum clots were included. The samples were analyzed using a Vcheck Foal IgG test kit (BIONOTE) according to the manufacturer's instructions. The remaining samples were measured using the Triple J Farms Equine IgG test at the BIONOTE laboratory by laboratory technicians.

Results

The test results for the correlation of equine IgG measurements between Vcheck and the RID test are shown in Figures 1-4. Samples outside the measurement range (100-1,000 mg/dl) of the Vcheck Foal IgG test kit were excluded from the analysis. A strong correlation (slope 0.995, **R^2 = 0.96**) was found between the two test methods when analyzing 102 whole blood, plasma, and serum samples (Figure 1). When measuring whole blood samples (N=40), plasma (heparin) samples (N = 20), and serum samples (N = 42) separately, a very high correlation of R^2 = 0.96 (Figure 2), R^2 = 0.95 (Figure 3), and R^2 = 0.96 (Figure 4) was observed, respectively.

Conclusion

This paper presents a validation of point-of-care (POC) IgG immunoassay in comparison to the RID assay, which has already been validated for the measurement of IgG in equine samples. The performance of the Vcheck Foal IgG immunoassay was similar to the RID in whole blood, plasma, and serum samples. Our study supports the conclusion that IgG results obtained from the POC immunoassay can be used interchangeably with the RID results for clinical purposes.

Reference
1) L. Tscheschlok, et al. Comparison of IgG concentrations by radial immunodiffusion, electrophoretic gamma globulin concentrations and total globulins in neonatal foals. Equine Veterinary Journal 0 (2016) 1–6
2) Metzger N, et al. Usefulness of a commercial equine IgG test and serum protein concentration as indicators of failure of transfer of passive immunity in hospitalized foals. J Vet Intern Med. 2006 Mar-Apr;20(2):382-7.
3) Ujvari S, et al. Validation of a Point-of-Care Quantitative Equine IgG Turbidimetric Immunoassay and Comparison of IgG Concentrations Measured with Radial Immunodiffusion and a Point-of-Care IgG ELISA. J Vet Intern Med. 2017 Jul;31(4):1170-1177.

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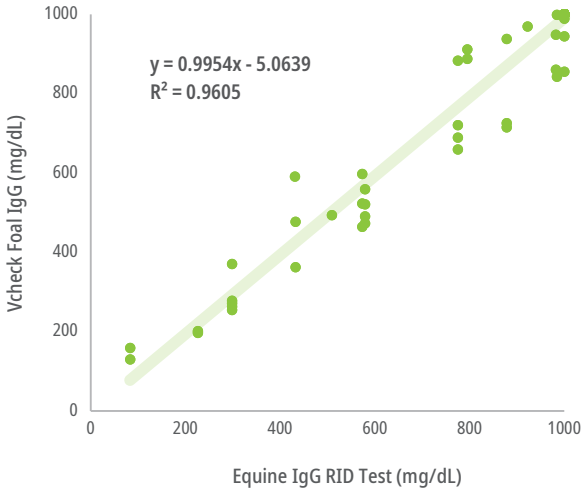

Fig. 1. Comparison between two methods for IgG concentration using 102 whole blood, plasma, and serum samples

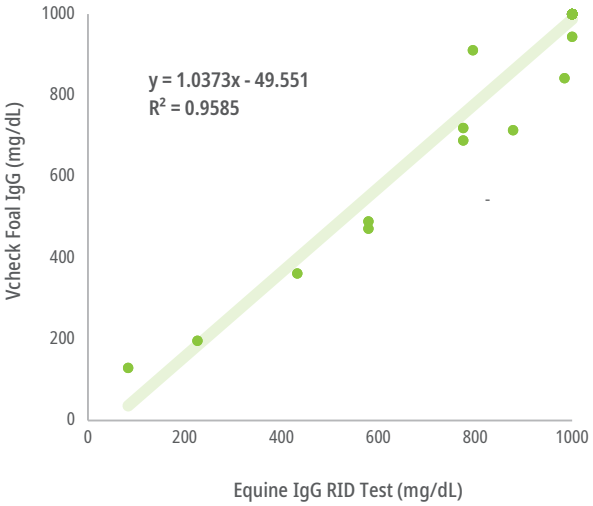

Fig. 2. Comparison between two methods for IgG concentration using 40 whole blood samples

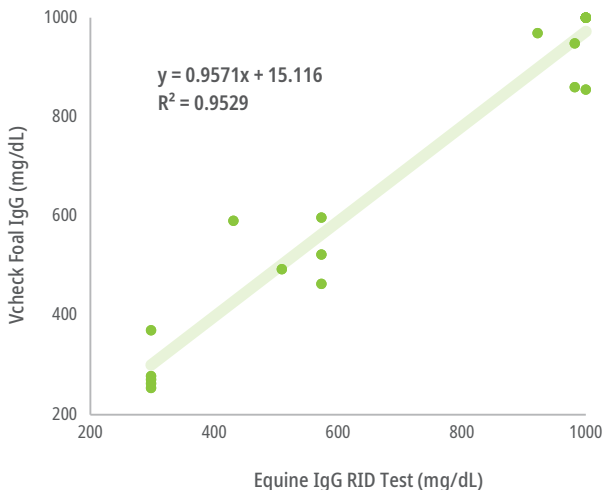

Fig. 3. Comparison between two methods for IgG concentration using 20 plasma samples

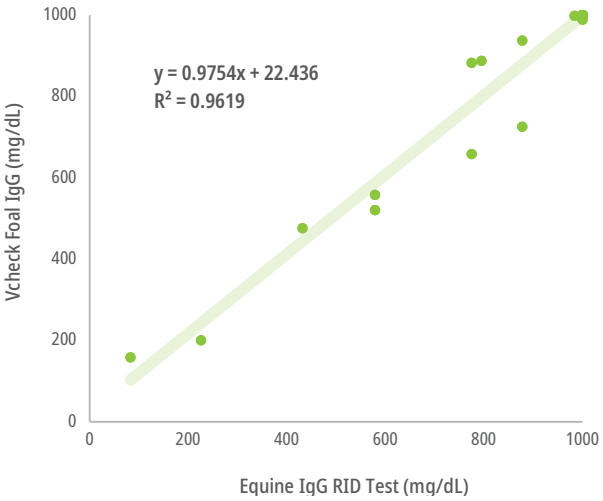

Fig. 4. Comparison between two methods for IgG concentration using 42 serum samples

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