

USE OF DGGR LIPASE FOR THE DIAGNOSIS OF CANINE AND FELINE PANCREATITIS

June 2021

Steve Hill, DVM, MS, DACVIM (SAIM)

Pancreatitis is a common condition in dogs and the diagnosis can be clinically challenging. Patients with pancreatitis most typically present with non-specific gastrointestinal signs of anorexia, vomiting, lethargy, diarrhea, abdominal pain, and/or weight loss. Other gastrointestinal and non-gastrointestinal conditions may have a similar presentation. In clinical practice the diagnosis of pancreatitis is most commonly made based on clinicopathologic findings and abdominal ultrasound abnormalities combined with other supportive features including a compatible history, signalment and physical examination abnormalities.

Controversy exists regarding the sensitivity and specificity of laboratory tests for the diagnosis of pancreatitis. The canine and feline pancreatic lipase (Spec cPL and fPL) are currently regarded as sensitive and specific for diagnosing pancreatitis in dogs and cats and in studies they are generally accepted as a biochemical surrogate marker of pancreatitis in clinical practice.¹⁻⁴ It's widely believed that serum lipase activity measured by catalytic assays is unreliable due to limited sensitivity and specificity. Care must be taken when interpreting the results of catalytic lipase assays as the methodology can affect diagnostic performance. The historical poor performance of catalytic lipase assays in dogs with pancreatitis is in largely based on studies using either the 1,2 diglyceride assay. Serum lipase determined by this methodology is likely not useful for diagnosing pancreatitis.^{1,5,6,7}

A novel catalytic assay, the 1,2-o-dilauryl-rac-glycero-3-glutaric acid-(6'-methylresorufin) ester or DGGR lipase assay for determination of serum lipase activity was introduced in 2001. The DGGR lipase assay was validated for use in dogs and the initial results demonstrated high sensitivity and moderate specificity in dogs with a clinical and ultrasonographic diagnosis of pancreatitis in 2005.⁸ There's been a resurgence of interest in the DGGR lipase assay and in the last four years with the goal of having a diagnostic test for pancreatitis at a lower cost, with greater availability, and with more rapidly available results than the Spec cPL and Spec fPL. Multiple studies have been published evaluating the clinical utility of the DGGR lipase for the diagnosis of pancreatitis dogs and cats.

2013

Agreement of DGGR lipase and Spec cPL was evaluated in cats with suspected pancreatitis.⁹ Results of this study showed substantial agreement of the DGGR lipase with Spec cPL illustrating that the DGGR lipase assay performed well in cats with pancreatitis demonstrating it's a useful method for diagnosing feline pancreatitis when compared with the Spec fPL.

2018

Multiple methods of determining pancreas lipase including the SNAP cPL, Spec cPL, VetScan cPL, Rapid Test and Precision PSL (DGGR methodology) assays for the diagnosis of clinical pancreatitis in dogs were compared.¹² A good to excellent level of agreement among the four assays was demonstrated.

2018

A study was performed to technically validate the DGGR lipase assay, to calculate the reference interval for DGGR lipase, to establish biological validity of the assay, and to assess agreement between the DGGR lipase and Spec cPL assays.¹³ Results showed substantial agreement between the DGGR lipase and Spec cPL and the validated DGGR lipase assay had similar sensitivity and specificity for the diagnosis of acute and chronic pancreatitis to the Spec cPL. Conclusions were the DGGR lipase is a reliable alternative to the Spec cPL for the diagnosis of pancreatitis.

DGGR lipase is a good alternative to the Spec cPL with the two assays having agreement when evaluation for the diagnosis of clinical pancreatitis in dogs and cats. The DGGR lipase may offer greater affordability, availability, and efficiency.



References

1. McCord K, Morley PS, Armstrong J, et al. A multi-institutional study evaluating the diagnostic utility of the Spec cPL™ and SNAP® cPL™ in clinical acute pancreatitis in 84 dogs. *J Vet Intern Med* 2012;26:888-896.
2. Trivedi S, Marks SL, Kass PH, et al. Sensitivity and specificity of canine pancreas-specific lipase (cPL) and other markers for pancreatitis in 70 dogs with and without histopathologic evidence of pancreatitis. *J Vet Intern Med* 2011;25:1241-1247.
3. Neilson-Carley SC, Robertson JE, Newman SJ, et al. Specificity of a canine pancreas-specific lipase assay for diagnosing pancreatitis in dogs without clinical or histologic evidence of the disease. *Am J Vet Res* 2011;72:302-307.
4. Armstrong PJ, Williams DA. Pancreatitis in cats. *Top Companion Anim Med* 2012;27:140-147.
5. Hess RS, Saunders HM, Van Winkle TJ, et al. Clinical, clinicopathologic, radiographic, and ultrasonographic abnormalities in dogs with fatal acute pancreatitis: 70 cases (1986-1995). *J Am Vet Med Assoc* 1998;213:665-670.
6. Trivedi S, Marks SL, Kass PH, et al. Sensitivity and specificity of canine pancreas-specific lipase (cPL) and other markers for pancreatitis in 70 dogs with and without histopathologic evidence of pancreatitis. *J Vet Intern Med* 2011;25:1241-1247.
7. Mansfield CS, Jones BR. Plasma and urinary trypsinogen activation peptide in healthy dogs, dogs with pancreatitis and dogs with other systemic diseases. *Aust Vet J* 2000;78:416-422.
8. Graca R, Messick J, McCullough S, et al. Validation and diagnostic efficacy of a lipase assay using the substrate 1,2-o-dilauryl-rac-glycero-3-glutaric acid-(6'-methylresorufin) ester for the diagnosis of acute pancreatitis in dogs. *Vet Clin Pathol* 2005;34:39-43.
9. Oppliger S, Hartnack S, Riond B, et al. Agreement of the serum Spec fPL and 1,2-o-dilauryl-rac-glycero-3-glutaric acid-(6'-methylresorufin) ester lipase assay for the determination of serum lipase in cats with suspicion of pancreatitis. *J Vet Intern Med* 2013;27:1077-1082.
10. Kook PH, Kohler N, Hartnack S, et al. Agreement of the serum Spec cPL and 1,2-o-dilauryl-rac-glycero-3-glutaric acid-(6'-methylresorufin) ester (DGGR) lipase assay with pancreatic ultrasonography in dogs with suspected pancreatitis. *J Vet Intern Med* 2014;28:863-870.
11. Oppliger S, Hilbe M, Hartnack S, Zini E, Reusch CE, Kook PH. Comparison of serum Spec fPL and 1,2-o-dilauryl-rac-glycero-3-glutaric acid-(6'-methylresorufin) ester assay in 60 cats using standardized assessment of pancreatic histopathology. *J Vet Intern Med* 2016;30:764-770.
12. Cridge H, MacLeod AG, Pachtinger GE, et al. Evaluation of SNAP cPL, Spec cPL, VetScan cPL, Rapid Test, and Precision PSL assays for the diagnosis of clinical pancreatitis in dogs. *J Vet Intern Med* 2018;32:658-664.
13. Goodband EL, Serrano G, Constantino-Casas F, et al. Validation of a commercial 1,2-o-dilauryl-racglycero glutaric acid-(6'-methylresorufin) ester lipase assay for diagnosis of canine pancreatitis. *Vet Rec Open* 2018;5:e000270 Doi:10.1136/vetreco-2017-000270.