

CLINICAL SPECIFICATIONS

STREPTOZYMES (NADASE, DNASE, STREPTOKINASE, STREPTOLYSIN O, AND HYALURONIDASE)

Pathogen Type:

Streptozymes (NADase, DNase, streptokinase, streptolysin O, and hyaluronidase) are extracellular products, or exoantigens, of the streptococcus bacteria, a gram-positive bacterium. Also known as Group A Streptococcal (GAS).

Associated With:

Rheumatic fever¹
 Rheumatic heart disease^{reviewed in 2}
 Tics / Tourette's syndrome^{reviewed in 2}
 PANDAS / OCD³
 Movement disorders^{reviewed in 2}
 Attention deficit disorders^{reviewed in 2}
 Reactive arthritis^{reviewed in 2}
 Pyoderma nephritis⁴

Known Cross-Reactions: Heart tissues, N-acetylglucosamine, myosin^{reviewed in 2}

Clinical Significance:

The detection of antibodies to Streptozymes indicates the patient has increased risk of neurological disorders including obsessive compulsive disorder (OCD), pediatric autoimmune neuropsychiatric disorders associated with streptococcal infections (PANDAS), rheumatic heart disorders and reactive arthritis. Streptococci may attach to pharyngeal or dermal epithelial cells. This is the first step in colonization of the host. If the bacterium does not attach, it will be removed by mucous and salivary fluid during exfoliation of the epithelium.² In cases of streptococci adhesion, the bacterium has the potential to invade epithelial cells.⁵ Due to potential cross-reactivity with heart tissues, streptococci have been shown to play a role in heart disorders. Recent research has shown a direct route from nasal tissue to brain. Dileepan *et al.*⁶ elucidated how Streptococcal infection induces T-helper 17 response in the nasal-associated lymphoid tissue (NALT), from which, when tonsils are repeatedly infected with Streptococci, GAS-specific Th17 cells migrate into the brain. By breaking down the blood-brain barrier, Streptococci infection leads to serum IgG deposition, microglial activation, and loss of excitatory synaptic proteins, while no bacteria can be detected in central nervous system tissue.⁶ This identified route between the oral cavity and the nervous system, which bypasses the gastrointestinal tract, provides a general mechanism by which oral pathogens exacerbate or trigger neurological conditions.

This array tests for IgG immune reactivity associated with Streptozymes. This is not a measurement of acute infection. Equivocal or out-of-range results indicate IgG antibody reactivity to the tested antigen. We tested 288 blood donor sera against Streptozymes antigens at optimal dilution, 16% of these donors were IgG reactive.

References:

1. Janeff, et al. A screening test for streptococcal exoenzymes. *Lab Med*, 1971; 2:38-40.
2. Cunningham. Pathogenesis of group A streptococcal infections. *Clin Microbiol Rev*, 2000; 13(5):470-511.
3. Vojdani. Obsessive compulsive disorder and differentiation between non-autoimmune OCD and the autoimmune version of the disease called PANDAS. *Latitudes*, 2003; 6(2):106.
4. Bergner-Rabinowitz, et al. Evaluation of streptozyme and antistreptolysin O tests in streptococcal pyoderma nephritis. *Appl Microbiol*, 1973; 26(1):56-58.
5. LaPenta, et al. Group A streptococci efficiently invade human respiratory epithelial cells. *Proc Natl Acad Sci USA*, 1994; 91:12115-12119.
6. Dileepan, et al. Group A *Streptococcus* intranasal infection promotes CNS infiltration by streptococcal-specific Th17 cells. *J Clin Invest*, 2016; 126(1):303-317.