Secretory IgA (sIgA)

Mucosal surfaces, such as those of the eyes, nose, throat, and GI tract, represent a large port of entry for pathogens and thus must be efficiently protected. This goal is achieved by a combination of innate and acquired immunoactivity. Innate immunity includes mucus, lactoferrin, lysozymes, and certain cytokines. Acquired immunity includes the production of antibodies. The primary antibody response at the mucosal level is secretory IgA (sIgA). sIgA is produced by activated B-cells in the mucosa where it forms immune complexes with pathogens and allergens, thereby preventing them from binding to and penetrating the intestinal mucosa. IgG is also found in the mucosa, but they are believed to be serum derived.

Antibody deficiencies are the most commonly reported immunodeficiencies worldwide. Selective IgA deficiency is the most common primary immunodeficiency, with prevalence from as low as 1 in 223 in community studies to 1 in 400 in healthy blood donors. Diagnosis is made with a serum IgA, though salivary and fecal sIgA levels are also found to be absent or low. Patients can also have a partial IgA deficiency, which isn't a genetic immunodeficiency. Rather, a partial IgA deficiency may be caused by environmental or lifestyle factors, such as nutrient deficiencies, drugs, virus', or impaired immune function, that can lead to chronic IgA stimulation. Over time, IgA production may decrease and a deficiency may be noticed in fecal, saliva or serum total IgA levels.

Patients with low IgA levels have increased risk of infections in mucosal surfaces, food allergies, celiac- like enteropathies, IBD, and autoimmune disorders. Some patients also have gastrointestinal issues and chronic diarrhea. Since sIgA serves to protect the gut, lower levels can also lead to an increased risk of leaky gut or dysbiosis. Leaky gut syndrome is your first line of defense, sIgA is decreased and is unable to adequately fight invaders trying to get into the intestinal epithelium. When the epithelium becomes inflamed and irritated, the tight junctions in the epithelium become weakened and allow toxins or antigens, generally food particles, to enter. These entering food particles cause the body to react by creating other classes of immunoglobulins, primarily IgG, to protect the blood and tissues. A patient with leaky gut may therefore have IgG reactions to many foods. An IgA deficiency can also lead to false-negative IgA-based test results, such as celiac. IgA deficiencies occurred in 1 out of 131 patients tested for celiac disease. Many patients with IgA deficiency are asymptomatic. It is not understood why some individuals with IgA deficiency have almost no illness while others are very sick. Studies have suggested that some patients may be missing a fraction of their IgG (the IgG2 and/or IgG4 subclasses), and that may be part of the explanation of why some patients with IgA deficiency are more susceptible to infection than others. Also, it is not known precisely what percent of individuals with IgA deficiency will eventually develop complications; estimates range from 25% to 50% over 20 years of observation. The clinical manifestation in a given patient tends to remain constant (e.g. in patients with autoimmune conditions, recurrent infections do not tend to develop).

Causes of Low sIgA

- Certain drugs can induce transient IgA deficiency which resolve after the causative drugs are removed. These include anti-inflammatories, sulfasalazine, hydantoin, cyclosporine, gold, fenclofenac, sodium valproate, and captopril.
- Certain viral infections, such as congenital rubella infection or Epstein-Barr virus (EBV) infection, may result in persistent IgA deficiency.
- Patients with poor nutrition may have difficulty mounting an appropriate immune response.
- Lower sIgA levels are frequently found in those with ulcerative colitis or in those whose first degree relatives have the disease. Research has shown a dysfunction in transepithelial IgA secretion, and thus a decrease in sIgA.
- A high antigenic load can result in depressed sIgA, even in healthy, asymptomatic individuals.
- Lower levels are found in those with excessive cortisol production, so decreasing stress may lead to higher sIgA levels.

- Lower levels may also be found in those with chronic infections or immune hypersensitivity. The decrease in resistance can lead to dysbiosis and an increased risk of infection and allergy.

Ways to Increase sIgA

Treating the overall gut, with exclusion or rotation diets, glutamine, fish oils for inflammation, and the entire 4-R program includes:

Treatment Using Four "R" Program for Intestinal Health:

- **Remove** offending foods, medications, gluten (if sensitive) and reduce high fat foods, refined carbohydrates, sugars, and fermented foods (if yeast is present). Consider antimicrobial, antifungal, and/or antiparasitic therapies in the case of opportunistic/pathogenic bacterial, yeast, and/or parasite overgrowth (see otherrecommendations below).
- **Replace** what is needed for normal digestion and absorption such as betaine HCl, pancreatic enzymes, herbs that aid in digestion such as deglycyrrhizinated licorice and marshmallow root, dietary fiber, and water.
- **Reinoculate** with favorable microbes (probiotics such as Lactobacillus sp., Bifidobacter sp., and Saccharomyces boulardii). To enhance the growth of the favorable bacteria, supplement with prebiotics such as insulin, xylooligosaccharides, and fiber.
- **Repair** mucosal lining by giving support to healthy intestinal mucosal cells, goblet cells, and to the immune system. Consider L-glutamine, essential fatty acids, zinc, pantothenic acid and vitamin C.

Other Recommendations for Increasing sIgA

- Exercise and relaxation techniques (such as footbaths, aromatherapy and massage) have been shown to increase sIgA levels.
- Decrease cortisol levels. Cortisol can direct the production of immune cells immuncytes, which produce sIgA.Probiotics (bifidobacter and Lactobacillus bacteria) have been shown to increase sIgA (as well as beneficial short chain fatty acids). They may also activate macrophages.
- Saccharomyces boulardii is used for the prevention and treatment of diarrhea of different etiologies and has been shown to enhance IgA immune response.