

Ankylosing spondylitis is an autoimmune condition caused by the immune system attacking joints, causing inflammation and deposition of cartilage, which eventually ossifies into bone in the joint space. The accumulation of the cartilage/bone could be seen as the body's attempt to heal the runaway inflammation. The offending part of the immune system, TNF- α , is common to both ankylosing spondylitis and rheumatoid arthritis^{1 2}. Targeting TNF through natural means instead of through TNF inhibition drugs is a much needed strategy³. Both conditions are more likely to occur in individuals that were not breastfed^{4 5} because breastfeeding is critical to development of a healthy microbiome and immune function⁶. There is a slightly different genetic predisposition in these diseases, though they are very similar⁷ and can occur in the same family.

Immune system control and function are very dependent on the gut microbiome for regulation⁸ and diet plays a huge role in modulating/determining the gut microbiome⁹. These changes in diet result in a compounding of microbiome alteration over generations¹⁰ and the alterations of microbiome colony diversity and health are the reason for immune dysregulation that results in autoimmune rheumatic disease¹¹.

While it has been known for some time that one of the biggest dietary problems that damage the microbiome is a lack of fruits and vegetables^{12 13 14} some writers have erroneously tried to implicate translocation of a specific species of bacteria¹⁵ and advocate elimination of starches to reduce its prevalence. This is a flawed approach, as it ignores the importance of intestinal barrier function¹⁶ and Zonulin¹⁷ modulation, both strongly determined by the microbiome.¹⁸ The inflammation and immune sensitization seen in autoimmune disease results in part from intestinal bacterial translocation across an abnormally permeable intestinal barrier^{19 20} and this is one reason that intestinal dysbiosis is associated with RA.²¹ A more natural and biologically viable approach would be to feed the beneficial gut bacteria such as Bifidobacteria which have been shown to inhibit enteropathogens such as Klebsiella²² while they also maintain better intestinal barrier function.²³ A diet with higher levels of vegetables²⁴ and leafy greens²⁵ has been shown to feed Bifidobacteria and improve immune function. Protection of the intestinal mucosal barrier and prevention of abnormal bacterial translocation can also be aided by Curcumin²⁶ and the amino acid Glutamine.²⁷

Vitamin D status is a significant risk factor in developing either RA or AS as both have been associated with low vitamin D status^{28 29}. Vitamin D, and vitamin D receptors (VDR) are also intimately connected to gut bacteria. VDR have the ability to change the gut bacteria, blocking or reducing some elements, and the gut bacteria can produce bile acids that bind to and alter VDR activity. In addition, VDR status determines immune function, such that abnormal VDR activity is associated with autoimmune disease including RA and AS³⁰. So, being in the sunlight is not enough to keep vitamin D levels and activity optimal; it may also be necessary to have a diet that supports a healthy microbiome so that vitamin D receptors are operating optimally as well.

There are several diseases that are associated with Human Leukocyte Antigen (HLA) haplotypes, all having autoimmune origins³¹ to disease progression. Both RA and AS are associated with dysbiosis of the intestinal microbiome, and both have specific genetic risk factors that contribute to the probability of developing the disease. For rheumatoid arthritis, the genetic link is HLA-DRB1³² and for ankylosing spondylitis it is HLA-B27³³. In both cases, the HLA abnormality has been shown to trigger the disease through alteration of the gut microbiome.^{34 35 36 37} These are some of the reasons that microbiome manipulation is such a promising new therapeutic direction in the treatment of inflammatory arthritis³⁸

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