



Rheumatoid Arthritis

Rapid Recap: Next Steps for Mrs. J's Early RA

Immune Function Video

- Sentinel cells of the innate immune system (monocytes, neutrophils, and dendritic cells) detect the presence and location of foreign pathogens, activating additional components of the immune system
- Cytotoxic natural killer T cells arrive, inducing cell death of intruding pathogens
- Phagocytic dendritic cells process pathogen tissue and present as antigen to activate T cells of the adaptive immune system
 - Activated T cells proliferate and activate B cells
 - Memory T and B cells are generated
 - Activated B cells develop plasma cells that generate antibodies
 - Antibodies bind to antigenic sites on pathogens, marking them for destruction
- In autoimmune diseases such as rheumatoid arthritis, healthy host cells are misidentified as foreign and attacked by the immune system

Pathological Mechanisms

- In RA, a combination of environmental and genetic factors cause mutations that lead the immune system to misidentify joint tissue as foreign, thus activating the adaptive immune system
- As noted above, phagocytic dendritic cells present antigen to T cells; activated T cells bind to B cells leading to the formation of plasma cells, which in turn generate the auto-antibodies of rheumatoid
- Auto-antibodies migrate to joint tissue where they initiate joint inflammation and damage by releasing cytokines such as TNF- α , IL-1, IL-6, and IL-17
- Biological DMARDs target these inflammatory pathways
 - Abatacept targets the co-stimulatory pathway of the antigen presenting cell
 - Rituximab targets the B-cell lines
 - TNF-inhibitors and IL-6 inhibitors target these inflammatory cytokines
 - JAK-inhibitors block signaling pathways that causes tissue damage

Case: Mrs. J's Early RA

- Chief complaint: 33-year-old female with polyarticular joint pain for the past 3 months
- Review of systems reveals:
 - Rheumatologic/Musculoskeletal: joint tenderness and swelling in hands, wrists and right foot
 - RAPID-3 score = 8 (high severity)
- Laboratory or radiographic tests to request:
 - Complete blood count (CBC)
 - Comprehensive metabolic panel (CMP)
 - Sedimentation rate (ESR) and C-reactive protein (CRP)

- Hepatitis B and C
- Rheumatoid factor
- Anti-CCP
- TSH
- Plain films for hands, feet, and chest
- RA diagnostic criteria met
 - Inflammatory arthritis
 - Positive for rheumatoid factor and anti-CCP
 - Elevated CRP and ESR
 - Exclusion of diseases with similar features
 - Duration > 6 weeks
- Treatment options
 - Disease remains active despite treatment with steroids and NSAIDs
 - Next step in treatment algorithm is DMARD monotherapy
 - If disease activity persists, combine DMARD with anti-TNF with or without methotrexate or a non-TNF biologic DMARD with or without methotrexate
 - Because she is breast feeding, treatment with a TNF inhibitor is the best option

Resources

- Van Delft MAM, Huizinga TWJ. An Overview of Autoantibodies in Rheumatoid Arthritis. *J Autoimmunity*. 2020;102392. <https://doi.org/10.1016/j.jaut.2019.102392>
- Singh JA et al. 2015 American College of Rheumatology Guideline for the Treatment of Rheumatoid Arthritis. *Arthritis Care Res*. 2016;68:1-25.

