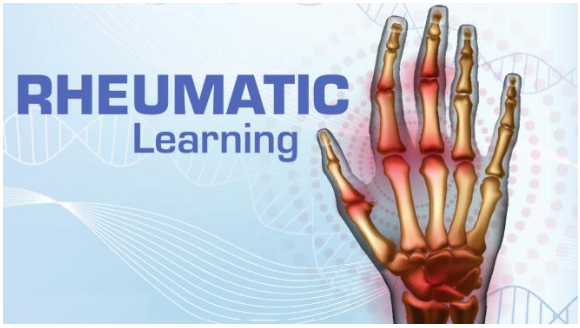

Rheumatoid Arthritis

Rapid Recap: Next Steps for Mr. S's Established 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: Mr. S's Established RA

- Chief complaint: 48-year-old male diagnosed with rheumatoid arthritis 2 years prior, now experiencing increasing joint pain and stiffness
- Review of systems reveals:
    - Rheumatologic/Musculoskeletal: joint tenderness and swelling in hands,
    - RAPID-3 score = 4 (moderate severity)
- Laboratory or radiographic tests to request:
    - Sedimentation rate (ESR) and C-reactive protein (CRP)
    - Plain films for hands to identify progressive erosive changes Rheumatoid factor

Provided by AAPA The France Foundation

- RA criteria for changing treatment
    - Patient reported pain
    - Evidence of synovitis on physical exam
    - Elevated CRP and ESR
    - Serial x-rays showing erosive changes
    - Increasing RAPID-3 score
- Treatment options for established RA
        - Patient is considered a single TNF inhibitor failure
        - Recommended next steps in treatment algorithm include
            - Switch to a non-TNF biologic such as rituximab, abatacept, or tocilizumab
            - Switch to a different TNF inhibitor such as certolizumab, etanercept, infliximab, or golimumab
    - If disease activity persists, ACR treatment guidelines recommend
        - Try another non-TNF biologic with or without methotrexate
        - Try a JAK inhibitor with or without methotrexate

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.