This Week in Rheumatology - 2024-11-24

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Ankylosing Spondylitis

Recent research highlights the utility of ultrasound in the diagnosis and management of peripheral spondyloarthritis, including ankylosing spondylitis. Ultrasound has been shown to be effective in detecting enthesitis, synovitis, and other inflammatory changes in the foot and ankle, making it a valuable diagnostic tool for seronegative spondyloarthritis. Furthermore, ultrasound can guide procedures like biopsies and steroid injections, making it an ideal point-of-care investigation for peripheral seronegative SpA. Its cost-effectiveness and ease of deployment make it an attractive option for clinicians managing these conditions.

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Immunology

Recent studies have shed light on the pivotal role of the hypoxic microenvironment in the pathogenesis and progression of various autoimmune diseases. The hypoxic microenvironment disrupts immune tolerance and enhances inflammatory responses, with hypoxia-inducible factor-1 (HIF-1) playing a central role in orchestrating cellular responses under low oxygen conditions. Emerging therapeutic strategies aim to target the hypoxic pathways, including HIF-1alpha inhibitors and mTOR inhibitors. Furthermore, research has also focused on the impact of B-cell-directed therapy on COVID-19 vaccine immunity in AIIRD, with a focus on Rituximab (RTX) and strategies to manage and predict vaccine responses in B-cell-depleted individuals. These findings have significant implications for the management of autoimmune diseases and COVID-19 vaccination in patients with AIIRD.

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Infectious Diseases

Individuals with systemic autoimmune rheumatic diseases are at higher risk of developing COVID-19 infection and post-acute sequelae of COVID-19 (PASC). The severity of acute COVID-19 infection, female sex, comorbidities, and immunosuppressive medications impact the risk of PASC. The etiology of PASC is poorly defined, making diagnosis and treatment challenging. A better understanding of the physiologic mechanisms could help to guide the development of targeted treatments.

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Osteoarthritis

Recent studies have investigated various treatment options for osteoarthritis, yielding mixed results. A retrospective cohort study found that prior use of intra-articular steroid injections and knee arthroscopy were associated with worse outcomes, including increased risk of revision and reoperation, and lower post-operative Oxford Knee Scores, although both interventions were also associated with a lower risk of mortality. In contrast, autologous-cultured adipose-derived mesenchymal stem cells and stromal vascular fractions have shown significant pain reduction and improvement in knee function, with the former providing more rapid pain relief. Intra-articular bipolar pulsed radiofrequency ablation has also been found to significantly improve pain, functionality, and quality of life in patients with advanced knee osteoarthritis. Furthermore, research has shown that the effectiveness of autologous adipose-derived mesenchymal stem cell therapy is correlated with the stemness and senescence of the stem cells. Additionally, a large-scale analysis of synovial fluid proteins has been conducted to identify biological networks associated with subtypes of osteoarthritis, which may lead to the development of precision medicine approaches. Overall, these studies provide valuable insights into the treatment options and molecular mechanisms of osteoarthritis, which can inform clinical decision-making and future research directions.

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Other Rheumatic Diseases

Recent studies have shed light on various aspects of other rheumatic diseases. A study on the direct medical costs of polyarthritis in pediatric patients in Mexico found that the cost of biological disease-modifying drugs accounted for 95.3% of the total cost, with a median cost of \$3,828 in the first 10 years of treatment. In contrast, a study on anti-SAE1 antibody-positive myositis and interstitial lung disease found that strong positive results

were more closely associated with idiopathic inflammatory myopathies and interstitial lung disease. The Myocardial Performance Index was found to be a useful tool for assessing cardiac function in autoimmune connective tissue disease, with elevated values suggesting potential for early detection and management of cardiac dysfunction. Trends in medication use during pregnancy showed an increase in the use of immunosuppressants, immunomodulators, and biologics, but exposure during pregnancy decreased over time. Factors influencing medication discontinuation varied by medication type, with prior biologics use and the year of pregnancy being key factors. A retrospective study of 293 patients with dermatomyositis found that different antibody phenotypes were associated with distinct clinical features, and identified several factors that affected prognosis. Finally, a new biomarker, interferon-stimulated gene 15, was identified as a highly specific diagnostic marker for dermatomyositis, and may have potential for clinical application.

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Psoriatic Arthritis

Recent studies have shed light on the management of psoriatic arthritis and the impact of COVID-19 vaccination on disease flares. A tailored approach to therapy, including non-medicinal interventions and pharmacologic treatments, is recommended for managing psoriatic arthritis. However, a systematic literature review and meta-analysis found that patients with psoriatic arthritis had a higher risk of joint flares compared to those with rheumatoid arthritis following COVID-19 vaccination. The study also found no increased risk of adverse events following immunization in patients with rheumatoid arthritis compared to spondyloarthritis. These findings highlight the need for careful consideration of vaccination strategies in patients with psoriatic arthritis.

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Rheumatoid Arthritis

Recent studies have shed light on various aspects of rheumatoid arthritis (RA) management and complications. For early detection of interstitial lung involvement, a radiation-free screening protocol has been proposed, which includes pulmonary function tests, pleuro-pulmonary transthoracic ultrasound, cardiopulmonary exercise tests, and echocardiography. Additionally, Scavenger receptor-A has been identified as a potential biomarker for RA disease activity, especially in patients with normal ESR and CRP levels. Hydroxychloroquine use has been associated with a decreased risk of developing type 2 diabetes in patients with RA. Researchers have also discovered a potential therapeutic target for RA by inhibiting a specific step in the transcription process of macrophages, which are key drivers of inflammation in the disease. Furthermore, studies have investigated the safety and efficacy of various treatments, including baricitinib, tofacitinib, and abatacept. Notably, a higher dose of baricitinib has been linked to increased liver enzymes, creatinine, and LDL cholesterol, as well as a higher risk of infections. In contrast, tofacitinib has been found to be effective and safe for treating RA in a real-world study. Abatacept has also been shown to be effective as a first-line biologic disease-modifying antirheumatic drug (bDMARD) in patients with ACPA- and RF-positive RA. However, certain medications, such as rituximab, abatacept, and Janus kinase inhibitors, have been associated with a higher risk of cancer. Finally, researchers have identified risk factors for the incidence of interstitial lung disease in patients with RA, including male gender, older age, smoking, and leflunomide usage. These findings highlight the importance of careful monitoring and management of RA patients to prevent complications and optimize treatment outcomes.

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Scleroderma

Recent research has shed new light on the complexities of Scleroderma, highlighting the importance of considering autoantibody profiles in the management of systemic sclerosis. A study of 1605 patients found that specific autoantibody profiles were strongly associated with organ involvement and mortality, while skin phenotype was not. The autoantibodies anti-topoisomerase I, anti-RNA polymerase III, anti-U1RNP, anti-Pm/Scl, and anti-Ku were associated with specific organ involvements and mortality. Furthermore, a separate study found that patients with very early systemic sclerosis (VEDOSS) have a gut microbiota imbalance with a decrease in beneficial anti-inflammatory bacteria and a significant decrease in faecal butyrate, which may worsen intestinal dysbiosis and inflammation in early SSc stages. This imbalance was not seen in patients with definite SSc, suggesting that butyrate administration in early disease phases might be a novel therapeutic approach to mitigate gastrointestinal discomfort and progression. These findings highlight the complexity of Scleroderma and the need for a multifaceted approach to understanding and managing the disease, taking into account both autoantibody profiles and gut microbiota imbalance.

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Systemic Lupus Erythematosus

Recent studies have shed light on the effectiveness of various treatments for Systemic Lupus Erythematosus (SLE). The Anifrolumab Study for Treatment Effectiveness in the Real World (ASTER) aims to evaluate the effectiveness of anifrolumab in a real-world setting, while a study on intravenous immunoglobulins found it to be effective in treating refractory SLE, especially with hematological involvement. Another study developed a predictive model for SLE incidence risk based on environmental exposure factors, which demonstrated strong predictive ability and was validated through various methods. Furthermore, research on the role of keratinocytes in SLE found that they play a crucial role in autoimmune diseases, and that chronic upregulation of type I interferon in keratinocytes leads to an inflammatory response and promotes cell death. Additionally, a study on short-term incremental prednisone therapy found it to be safe and effective in reducing the risk of relapse in patients with serologically active and clinically quiescent lupus nephritis. Finally, a novel humanized anti-CD132

monoclonal antibody, 2D4, was developed to target CD132, a subunit common to six inflammatory factor receptors implicated in SLE, and showed superior efficacy in ameliorating the inflammatory state and preserving renal function in lupus murine models compared to Belimumab. Overall, these studies provide new insights into the management and treatment of SLE, and highlight the importance of considering environmental factors, keratinocyte involvement, and novel therapeutic targets in the development of effective treatments.

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Vasculitis

Recent studies have shed light on the clinical perspective of ANCA-associated vasculitis (AAV), a group of small-vessel necrotizing vasculitides that can affect the lungs, respiratory tract, and kidneys. AAV is characterized by the presence of ANCA antibodies and can manifest as granulomatosis with polyangiitis, microscopic polyangiitis, or eosinophilic granulomatosis with polyangiitis. Treatment typically involves corticosteroids and either cyclophosphamide or rituximab, with plasma exchange considered in severe cases. Early recognition and treatment are crucial for a good outcome. In contrast, large vessel vasculitides (LVV) are a group of inflammatory disorders affecting the large arteries, with giant cell arteritis being the most common form in people over 50 and Takayasu arteritis more common in younger populations. Noninvasive imaging

methods, such as ultrasound, MRI, CT, and PET, have revolutionized the approach to managing LVV, enabling prompt identification and reducing the need for invasive procedures. These imaging methods are crucial for diagnosis, surveillance, and treatment response assessment, and have greatly improved the management of LVV, preventing debilitating complications. Overall, these studies highlight the importance of early recognition and treatment of vasculitis, as well as the critical role of imaging in managing large vessel vasculitis.

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