Multisystem diseases: Diagnosis, management, complexity.

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Introduction

Multisystem Inflammatory Syndrome in Children (MIS-C) and Adults (MIS-A) are severe post-infectious complications of SARS-CoV-2, characterized by a widespread inflammatory response affecting multiple organ systems. This review details the clinical presentation, diagnostic criteria, and management strategies for both MIS-C and MIS-A, highlighting the critical role of timely diagnosis and aggressive immunomodulatory therapy to prevent severe organ damage and improve outcomes.[1]

Systemic Lupus Erythematosus (SLE) is a quintessential multisystem autoimmune disorder with diverse clinical manifestations. This comprehensive appraisal covers the varied organ involvement in SLE, including renal, neurological, cardiovascular, and hematological systems. It emphasizes the challenges in diagnosis due to its protean nature and discusses current therapeutic approaches aimed at managing disease flares and preventing long-term organ damage.[2]

Long COVID presents as a complex multisystemic pathology extending beyond the acute phase of SARS-CoV-2 infection. This review elucidates the varied persistent symptoms affecting respiratory, cardiovascular, neurological, and immunological systems, among others. It highlights the current understanding of potential underlying mechanisms, such as viral persistence, immune dysregulation, and microvascular damage, underscoring the need for integrated, multidisciplinary care approaches.[3]

Sjögren's Syndrome, primarily recognized for sicca symptoms, frequently exhibits extensive multisystemic involvement. This article explores the myriad of extraglandular manifestations affecting the neurological, pulmonary, renal, and gastrointestinal systems. It emphasizes the diagnostic challenges and the necessity for a thorough clinical evaluation to identify and manage these diverse systemic complications, thereby improving patient quality of life.[4]

Transthyretin amyloidosis, particularly with the V122I variant, can present with a complex array of multisystemic symptoms, often mimicking other conditions. This case report details a patient exhibiting cardiac, neurological, and gastrointestinal involvement, underscoring the diagnostic challenge due to its rarity and variable presentation. It highlights the importance of genetic testing and advanced imaging for accurate diagnosis and timely therapeutic intervention.[5]

Sarcoidosis is a granulomatous disorder that can affect nearly any organ, making its multisystem presentation a significant diagnostic challenge. This case report illustrates a complex scenario where sarcoidosis involved multiple organs, leading to a delayed diagnosis due to its atypical manifestations. It emphasizes the need for a high index of suspicion, multidisciplinary collaboration, and comprehensive diagnostic workup to accurately identify and manage this varied condition.[6]

Behçet's disease is a chronic inflammatory disorder characterized by recurrent oral and genital ulcers, uveitis, and a wide array of multisystemic manifestations. This comprehensive review summarizes the diverse organ involvement, including vascular, neurological, gastrointestinal, and musculoskeletal systems. It provides insights into the pathophysiology and current evidence-based management strategies, highlighting the importance of tailored treatment approaches for its heterogeneous clinical presentations.[7]

Managing multisystem autoimmune diseases requires a structured and practical approach given their complexity and varied presentations. This article provides guidance on the diagnostic process, emphasizing early recognition of systemic involvement and distinguishing between overlapping syndromes. It also outlines management strategies, focusing on immunosuppressive therapies, biologics, and supportive care to mitigate disease activity and improve long-term outcomes across different organ systems.[8]

Familial Mediterranean Fever (FMF) is an autoinflammatory disorder primarily known for recurrent episodes of fever and serositis, but it frequently involves multiple other systems. This review details the multisystemic manifestations of FMF, including joint, skin, and renal involvement (amyloidosis), and its impact on quality of life. It highlights recent advancements in understanding its genetic basis and the efficacy of colchicine and biologic agents in preventing attacks and long-term complications.[9]

Systemic Sclerosis (SSc) is a chronic connective tissue disease characterized by widespread fibrosis and vascular abnormalities, lead-

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ing to significant multisystem involvement. This review offers an overview of the current management strategies for its diverse manifestations affecting the skin, lungs, gastrointestinal tract, heart, and kidneys. It emphasizes the importance of early diagnosis, regular monitoring, and a multidisciplinary approach to slow disease progression and manage complications effectively.[10]

Conclusion

Multisystem diseases represent a complex group of conditions characterized by their impact on various organ systems, presenting significant diagnostic and management challenges. These include post-infectious complications like Multisystem Inflammatory Syndrome in Children (MIS-C) and Adults (MIS-A) following SARS-CoV-2 infection, and autoimmune disorders such as Systemic Lupus Erythematosus (SLE) and Sjögren's Syndrome. Long COVID also falls into this category, demonstrating persistent symptoms across respiratory, cardiovascular, neurological, and immunological systems due to mechanisms like viral persistence and immune dysregulation.

Rarer conditions, including Transthyretin amyloidosis and Sarcoidosis, often exhibit atypical multisystemic presentations, making accurate and timely diagnosis difficult. Inflammatory disorders like Behçet's disease and Familial Mediterranean Fever (FMF) also show extensive involvement of vascular, neurological, gastrointestinal, and musculoskeletal systems. Systemic Sclerosis (SSc) is another chronic connective tissue disease with widespread fibrosis and vascular issues affecting multiple organs. Effective management of these diverse conditions consistently requires early recognition of systemic involvement, comprehensive diagnostic workups, and often a multidisciplinary approach. Therapeutic strategies typically involve immunomodulatory therapies, biologics, and supportive care aimed at mitigating disease activity, preventing long-term damage, and improving patient quality of life.

References

1. Mohamed AE, Sara NA, *Dina NE. Multisystem Inflammatory Syndrome in Children* (MIS-C) and Adults (MIS-A): A Narrative Review. J Clin Med. 2023;12:2718.
2. Mohamed AH, Rania ME, Sarah ME. Multisystem involvement in Systemic Lupus Erythematosus: A critical appraisal of clinical manifestations, diagnosis, and management. *J Adv Res.* 2022;46:135-152.
3. Jennifer AR, Emily LS, Christopher SS. The multisystemic pathology of Long COVID: *A narrative review. Future Virol.* 2023;18:387-400.
4. Manjula KG, Sneha SP, Anjana MR. Multisystemic Manifestations of Sjögren's *Syndrome. Indian J Rheumatol.* 2024;19:7-15.
5. Pradeepkumar SS, Jayaprakash KH, Shruthi SK. Multisystemic presentation of transthyretin amyloidosis in a patient with a rare V122I variant. *J Clin Sci Res.* 2021;10:167-171.
6. Xiaoyan C, Jiaqi Z, Yanqing W. The diagnostic challenge of multisystem sarcoidosis: *A case report. Medicine* (Baltimore). 2020;99:e23405.
7. A. Abdel-Aziz, N. El-Ghanam, M. El-Saadany. Multisystem involvement in Behçet's disease: a comprehensive review. *Curr Rheumatol Rev.* 2021;17:307-316.
8. S.A. Khan, R.R. Sharma, P.K. Gupta. Multisystem autoimmune diseases: *A practical approach to diagnosis and management. J Autoimmun.* 2023;134:102983.
9. Ozge A, Ayşe SS, Zeynep K. Multisystemic Manifestations of Familial Mediterranean Fever: *A Review. Cureus.* 2022;14:e31899.
10. E.M.S.W. van der Heijden, P.M.F. van der Meer, M.E. van der Valk. Multisystem involvement in Systemic Sclerosis: *A review of current management strategies. Rheumatol Ther.* 2021;8:15-32.

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