## 01. A Kaleidoscope of Autoimmunity: Divergent Autoimmune Phenotypes within a Nuclear Family

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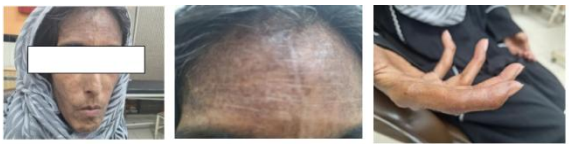
**Background**: Autoimmune diseases (ADs) are increasingly recognized as interconnected entities sharing common genetic, immunological, and environmental determinants, a concept described as autoimmune tautology. This is clinically reflected in polyautoimmunity, where multiple ADs coexist in a single individual, and familial autoimmunity, where different autoimmune conditions occur among members of the same family. These observations form part of the broader mosaic of autoimmunity, in which various contributing factors interact dynamically. The term kaleidoscope of autoimmunity further illustrates how similar underlying mechanisms can produce diverse clinical phenotypes across individuals and overtime. Reports of markedly divergent autoimmune manifestations within a single nuclear family, however, remain limited..

**The Case:** We report two sisters with distinct yet overlapping autoimmune manifestations. The first patient, a 38-year-old woman presented with acute flaccid quadriparesis due to severe hypokalemia. Further evaluation revealed distal renal tubular acidosis characterized by hypokalemia, metabolic acidosis, alkaline urine, nephrocalcinosis, and renal calculi. Immunological workup demonstrated positive antinuclear antibodies with polyarthralgias confirming systemic lupus erythematosus (SLE). She was additionally diagnosed with autoimmune hypothyroidism based on elevated thyroid stimulating hormone and positive antithyroid peroxidase antibodies. Treatment with potassium replacement, thyroxine supplementation, corticosteroids, and methotrexate resulted in significant clinical improvement over two years. This case exemplifies polyautoimmunity, with SLE coexisting alongside autoimmune thyroid disease and renal tubular dysfunction. The second patient, her 42-year-old sister, presented with right upper quadrant pain, jaundice, weight loss, and elevated liver enzymes. Positive antinuclear and anti-smooth muscle antibodies supported a diagnosis of autoimmune hepatitis (AIH). Clinical examination demonstrated features of systemic sclerosis, including facial and neck skin tightening, Raynaud's phenomenon, sclerodactyly, and salt and pepper depigmentation. During follow up she developed sicca symptoms and a positive Schirmer test confirmed Sjogren's syndrome. She responded favorably to azathioprine and corticosteroid therapy with subsequent biochemical and symptomatic improvement. This case highlights polyautoimmunity with overlap among systemic sclerosis, AIH, and Sjogren syndrome. **Conclusion:** These cases illustrate familial autoimmunity within a nuclear family, with two genetically related individuals exhibiting distinct autoimmune phenotypes. Both patients also demonstrated polyautoimmunity, emphasizing the tendency of autoimmune diseases to cluster and overlap. Collectively these observations illustrate the kaleidoscope of autoimmunity whereby shared pathogenic pathways may lead to heterogenous clinical expressions. Recognition of such patterns is important for timely diagnosis, comprehensive evaluation, and long term surveillance for additional autoimmune disorders in affected patients and their families.

**Figure** 1- (a) Face with rigid, tight look, mouse-like" or pinched nose, microstomia, purse-string" wrinkles around lips, (b) En Coup de Sabre (indented band of hardened skin running down the forehead), salt-and-pepper" skin pigmentation (c) Sclerodactyly resulting in a caw-like hand shape





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