INTESTINAL INVOLVEMENT IN SYSTEMIC SCLERODERMA

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ABSTRACT

Systemic scleroderma (SSc) is a multifaceted autoimmune disorder marked by fibrosis in the skin and internal organs. Gastrointestinal (GI) tract involvement ranks as the second most prevalent feature after skin changes, affecting up to 90% of patients. In particular, small and large intestine manifestations are critical, occurring in 40-70% of cases, leading to dysmotility, malabsorption, and severe morbidity. These include small intestinal bacterial overgrowth (SIBO), pseudo-obstruction, and malnutrition, which contribute significantly to reduced quality of life and elevated mortality rates. The pathogenesis involves vascular damage, smooth muscle atrophy, and neural dysfunction, exacerbated by fibrosis and inflammation. This thesis explores the pathogenesis, clinical presentations, diagnostic approaches, and therapeutic strategies for intestinal involvement in SSc. The aim is to assess current scientific insights and propose innovative management protocols. Findings indicate SIBO in 30-60% of patients, often linked to hypomotility and a 50% mortality risk from malnutrition. Disease progression is driven by endothelial dysfunction, platelet activation, and cytokine overexpression like IL-6. Management relies on prokinetics and antibiotics, but emerging therapies such as fecal microbiota transplantation (FMT) and neuromodulation show promise. The thesis provides recommendations for early detection and multidisciplinary care in SSc patients, considering genetic variations and microbiome alterations.

Keywords: scleroderma, intestinal involvement, small intestinal bacterial overgrowth, gastrointestinal dysmotility, malabsorption, pseudo-obstruction, fibrosis, vascular damage, autoimmune processes, malnutrition, prokinetics, fecal microbiota transplantation, endoscopy, breath testing, manometry.

INTRODUCTION

Systemic scleroderma (SSc) is a rare autoimmune condition characterized by excessive collagen deposition in tissues, leading to organ dysfunction. The global incidence is approximately 19.3 cases per million adults, predominantly affecting females aged 44-55 with a 5:1 ratio over males. GI involvement is nearly universal, with the intestines frequently impacted after the esophagus [1, 2]. Small bowel hypomotility affects 40-70% of patients, resulting in SIBO, which causes bloating, diarrhea, and nutrient deficiencies. Large bowel changes, seen in 20-50%, include constipation and fecal incontinence due to colonic inertia. These manifestations arise from microvascular occlusion, leading to ischemia and neural degeneration [3, 4]. Fibrotic replacement of smooth muscle layers impairs peristalsis, while autonomic

neuropathy disrupts coordination. Cytokines such as TGF-β and IL-6 promote extracellular matrix accumulation, aggravating the process. Genetic factors, including HLA associations, and environmental triggers like silica exposure may influence severity [5, 6]. Ethnic differences exist, with higher GI burden in certain populations. Symptoms like abdominal pain (60%) and weight loss (30%) often emerge early, but asymptomatic cases delay diagnosis. Intestinal involvement correlates with pulmonary fibrosis through shared fibrotic pathways, increasing overall mortality. This thesis, based on recent reviews from PubMed and other databases, highlights the need for integrated care, emphasizing early intervention to mitigate complications like bacterial translocation and sepsis [7, 8].

RELEVANCE

The relevance of this study stems from the high prevalence of intestinal complications in SSc, which significantly impair daily functioning and survival. With GI dysmotility contributing to 50% of SSc-related deaths via malnutrition, timely management is crucial. Recent advances in diagnostics like lactulose breath testing reveal SIBO rates up to 60%, yet treatment efficacy remains limited, with antibiotic resistance rising. Global trends show increasing SSc incidence, underscoring the need for updated guidelines. Relevance lies in addressing gaps in microbiome-targeted therapies, as dysbiosis exacerbates inflammation. Multidisciplinary approaches can reduce hospitalization rates by 30%, improving outcomes.

OBJECTIVE

The objective of this research is to analyze the pathogenesis, clinical features, diagnostics, and treatments of intestinal involvement in SSc. By reviewing contemporary literature, it aims to propose enhanced protocols, including microbiome modulation and advanced imaging. The thesis seeks to improve early detection and personalized care, integrating novel tools like wireless motility capsules to optimize prognosis in SSc patients.

RESULTS AND DISCUSSION

Results from meta-analyses show SIBO in 30-60% of SSc cases, with hypomotility confirmed by scintigraphy in 50%. Colonic involvement leads to pseudo-obstruction in 10-20%, often requiring hospitalization. Breath tests detect hydrogen/methane elevation in 70% of symptomatic patients. Discussion highlights pathogenesis: endothelial injury causes telangiectasias and ischemia, while fibrosis replaces musculature, reducing transit time by 50%. Microbiome shifts, with reduced diversity, promote bacterial overgrowth and systemic inflammation. Clinical signs include steatorrhea (40%) and vitamin deficiencies (B12 in 30%). Diagnostics: antroduodenal manometry reveals absent migrating motor complexes in 60%; MRI enterography visualizes wall thickening. Treatment: rifaximin eradicates SIBO in 60%, but recurrence is high (50%); prokinetics like prucalopride improve motility by 40%.

FMT restores gut flora in refractory cases, reducing symptoms by 70% in trials. Nutritional support prevents cachexia. New approaches: anti-fibrotic agents like nintedanib target intestinal fibrosis; neuromodulators alleviate pain. Discussion notes ethnic variations, with higher SIBO in Asian cohorts. Large trials are needed for microbiome therapies. Early manometry and antibiotics enhance quality of life, but etiological treatments remain elusive [9, 10].

CONCLUSION

Intestinal involvement in SSc is prevalent and debilitating, driving malnutrition and mortality. Early diagnostics like breath testing and manometry are essential, preventing complications like pseudo-obstruction. Treatments focus on antibiotics and prokinetics, with FMT promising for dysbiosis. Future research should explore anti-fibrotics and personalized microbiome interventions. This thesis advocates multidisciplinary management to improve survival and quality of life in SSc, transforming intestinal care through innovative strategies.

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