

University of Groningen

Undernutrition and sarcopenic obesity

Jager-Wittenaar, H.; Vissink, A.; Kroese, F. G. M.; Bootsma, H.

Published in:
Clinical and Experimental Rheumatology

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2021

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Jager-Wittenaar, H., Vissink, A., Kroese, F. G. M., & Bootsma, H. (2021). Undernutrition and sarcopenic obesity: underrecognised conditions in patients with Sjögren's syndrome? *Clinical and Experimental Rheumatology*, 39(6), S20-S22. <https://www.clinexprheumatol.org/pubmed/find-pii.asp?pii=34596029>

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

Undernutrition and sarcopenic obesity: underrecognised conditions in patients with Sjögren's syndrome?

H. Jager-Wittenaar^{1,2}, A. Vissink¹, F.G.M. Kroese³, H. Bootsma³

¹Department of Oral and Maxillofacial Surgery, University of Groningen, University Medical Center Groningen, Groningen;

²Research Group Healthy Ageing, Allied Health Care and Nursing, Hanze University of Applied Sciences, Groningen;

³Department of Rheumatology and Clinical Immunology, University of Groningen, University Medical Center Groningen, the Netherlands.

Harriët Jager-Wittenaar, RD, PhD
Arjan Vissink, DDS, MD, PhD
Frans G.M. Kroese, MD, PhD
Hendrika Bootsma, MD, PhD

Please address correspondence to:

Harriët Jager-Wittenaar,
Department of Oral and Maxillofacial Surgery,
University Medical Center Groningen,
P.O. Box 30.001,
9700 RB Groningen, The Netherlands.
E-mail: h.jager@umcg.nl

Received on May 28, 2021; accepted in revised form on July 26, 2021.

Clin Exp Rheumatol 2021; 39 (Suppl. 133): S20-S22.

© Copyright CLINICAL AND EXPERIMENTAL RHEUMATOLOGY 2021.

Key words: Sjögren's syndrome, malnutrition, sarcopenia, obesity, muscle

Introduction

Sjögren's syndrome (SS) is a chronic, systemic autoimmune disease affecting the exocrine glands (1). Clinical manifestations of pSS include dry mouth and related problems like poor dental status, swallowing problems, and loss of taste and smell. Because of the reduced saliva production, many patients with pSS experience problems with food intake. Patients with pSS may have difficulty with swallowing hard and sticky food products (2). They need additional fluids to enable food transport in the mouth and oesophagus. Moreover, the lack of saliva often results in rampant caries and tooth loss (2). The poor dental status may further hinder eating hard food products. From other patient populations, *e.g.* patients with head and neck cancer, it is known that oral symptoms like dry mouth, swallowing and chewing problems, and poor dentition may impact dietary intake, especially protein intake. These oral symptoms have been associated with malnutrition (3-5). pSS also affects the digestive tract directly. Gastrointestinal dysmotility that is characterised by reflux and passage problems in the oesophagus, stomach and intestines is also frequently present in patients with pSS (6). Dysfunction of the liver and pancreas may further disturb the digestive process (7). These symptoms and manifestations of the digestive tract hinder adequate intake and absorption of both macro- and micronutrients, and may thus result in malnutrition, characterised by loss of muscle mass. In addition, other manifestations, like fatigue, a prominent symptom in patients with pSS (8, 9) that may result from psychological distress, anaemia, or inflammation (8, 10), as well as systemic inflammation and systemic treatment like anti-inflammatory therapy with corticosteroids (*e.g.* prednisone)

(11) may contribute to loss of muscle mass. Recently, it was demonstrated that patients with pSS have a low intake of ω -3 and ω -6 fatty acids, and that higher levels of serum ω -3 (α -linolenic acid and docosahexaenoic acid) correlate with lower ocular symptoms and disease activity, thus suggesting a possible role of chronic inflammation (12). From other populations with rheumatoid diseases, chronic inflammation is known to contribute to loss of muscle mass (13). Whether malnutrition is reflected by the observed change in intestinal microbiota in pSS patients (14), and herewith contributes to the disease progress, remains to be further studied.

Undernutrition and sarcopenic obesity

Malnutrition can present as two different phenotypes, *i.e.* undernutrition or sarcopenic obesity. Undernutrition has been defined as "a state resulting from lack of intake or uptake of nutrition that leads to altered body composition (decreased fat free mass) and body cell mass leading to diminished physical and mental function and impaired clinical outcome from disease" (15). To diagnose undernutrition, the Global Leadership Initiative on Malnutrition (GLIM) criteria have been developed (16). According to the GLIM criteria, undernutrition is present if at least one of the phenotypic criteria and at least one etiologic criterion is present (Fig. 1). While a consensus-based definition for sarcopenic obesity is lacking, it is primarily characterised by low muscle mass in combination with excess of fat mass (17). In practice, excess of fat mass is considered when the BMI is ≥ 30 kg/m². It remains unclear to which extent patients with pSS are undernourished or have sarcopenic obesity. Malnutrition may result in a negative

Competing interests: none declared.

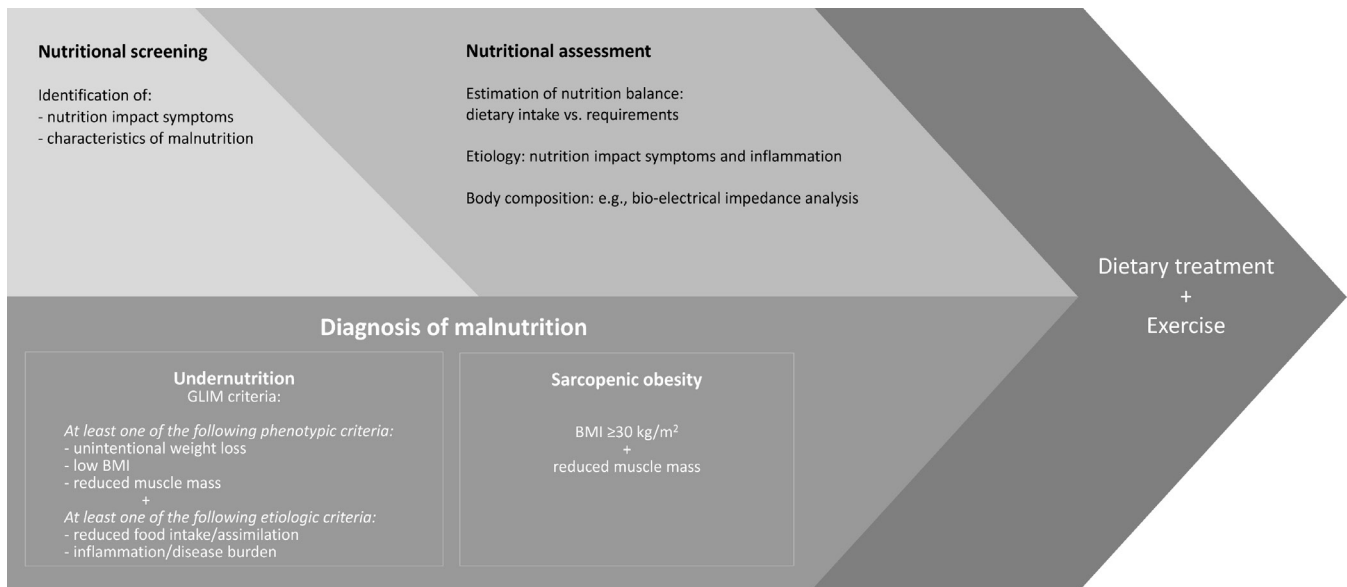


Fig. 1. Recommended nutritional risk screening, nutritional assessment and treatment of patients with pSS. BMI: body mass index; GLIM: Global Leadership Initiative on Malnutrition (16).

spiral, because malnutrition is known to be associated with poorer clinical outcomes including lower tolerance of systematic therapy (18) and lower quality of life (19, 20). The decrease in muscle mass may contribute to or even increase fatigue, which may result in reduced physical activity in patients with pSS (21), which in turn may result in further loss of muscle mass due to disuse muscle atrophy (11).

Besides becoming undernourished, loss of muscle can also be accompanied by obesity. In a study in 39 patients with pSS classified according to the 2016 American College of Rheumatology/European League Against Rheumatism (ACR/EULAR) classification criteria, we found a body mass index (BMI) of 25 ± 5 kg/m², indicating that 95% of the population has a BMI between 15 kg/m² and 35 kg/m² (22). This finding suggests that in addition to underweight (*i.e.* BMI < 18.5 kg/m², a characteristic of undernutrition), obesity (*i.e.* BMI ≥ 30 kg/m²) is also prevalent in patients with pSS (22). In the same study, we also found that a fair amount of patients with pSS use an unhealthy diet (22). In the same study, patients completed the Dutch Healthy Diet Food Frequency Questionnaire (DHD-FFQ). The DHD-FFQ is an instrument that evaluates intake of physical activity, vegetables, fruit, dietary fibre, saturated

fatty acids, trans fatty acids, consumption occasions with acidic drinks and foods, sodium and alcohol. In our study, we found a mean score of 56 ± 12 , which on group level was above the cut-off for a healthy diet, *i.e.* 53 points but lower than DHD-FFQ scores of the Dutch population, *i.e.* 68.7 ± 16.1 for men and 79.4 ± 16.0 for women (23). This score of 56 ± 12 in our study also indicated that a fair amount of the patients with pSS scored below the cut-off for a healthy diet. The unhealthy diet may be accompanied by higher energy intake, suggesting that the obesity may be related to the dietary pattern of the patient with pSS.

Knowledge gap on dietary intake in patients with Sjögren's syndrome

Since malnutrition (*i.e.* undernutrition or sarcopenic obesity) is known to negatively impact daily functioning, quality of life, and healthcare costs (19, 20, 24), adequate dietary intake, and maintenance of muscle mass and muscle function are of utmost importance in patients with pSS. However, thus far, studies that focused on dietary intake and nutritional status in patients with pSS are scarce, characterised by small study samples and showing conflicting data. Studies from Norway (25) and New Zealand (26) reported that dietary intake among patients with SS does not

differ from recommended intake and did not alter body composition (24). On the contrary, an American study showed that women with pSS ($n=24$) had higher energy intake than healthy controls (27). Also a study in older patients with SS ($n=28$) reported multiple nutrient deficiencies including energy, protein, vitamin A, C, B1, B2, B6, fibre, iron, calcium and zinc (28).

What to do?

To enable improvement of quality of life of patients with pSS, it is of utmost importance to elucidate the relationship between diet, nutritional status, and the potential relationship with disease manifestations of patients with pSS. Better insight in the diet and nutritional status of these patients, as well as understanding how pSS-related factors influence food choices, will help to develop a personalised dietary treatment for patients with pSS. This insight and understanding will improve dietary intake and optimise nutritional status including muscle status. Moreover, it has to be assessed whether changes in the oral microbiome, intestines or both play a role and if so, how they can be influenced. For daily practice, we recommend to include nutritional risk screening and nutritional assessment in the routine work up of patients with pSS at diagnosis and follow up. The nutritional

screening and assessment serve as basis to identify nutrition impact symptoms, *i.e.* oral and systemic disease manifestations that hinder food intake, to diagnose nutrition-related disorders like undernutrition and sarcopenic obesity, and to initiate multimodal treatment including dietary treatment and exercise to improve muscle status (Fig. 1).

References

- GOLDBLATT F, O'NEILL SG: Clinical aspects of autoimmune rheumatic diseases. *Lancet* 2013; 382: 797-808.
- JENSEN SB, VISSINK A: Salivary gland dysfunction and xerostomia in Sjögren's syndrome. *Oral Maxillofac Surg Clin North Am* 2014; 26: 35-53.
- JAGER-WITTENAAR H, DIJKSTRA PU, VISSINK A, VAN DER LAAN BF, VAN OORT RP, ROODENBURG JL: Critical weight loss in head and neck cancer—prevalence and risk factors at diagnosis: an explorative study. *Support Care Cancer* 2007; 15: 1045-50.
- JAGER-WITTENAAR H, DIJKSTRA PU, VISSINK A, VAN OORT RP, VAN DER LAAN BF, ROODENBURG JL: Malnutrition in patients treated for oral or oropharyngeal cancer—prevalence and relationship with oral symptoms: an explorative study. *Support Care Cancer* 2011; 19: 1675-83.
- DE PINHO NB, MARTUCCI RB, RODRIGUES VD *et al.*: Malnutrition associated with nutrition impact symptoms and localization of the disease: Results of a multicentric research on oncological nutrition. *Clin Nutr* 2019; 38: 1274-9.
- MELCHOR S, SÁNCHEZ-PIEDRA C, FERNÁNDEZ CASTRO M *et al.*: Digestive involvement in primary Sjögren's syndrome: analysis from the Sjögrensen registry. *Clin Exp Rheumatol* 2020; 38 (Suppl. 126): S110-5.
- EBERT EC: Gastrointestinal and hepatic manifestations of Sjögren syndrome. *J Clin Gastroenterol* 2012; 46: 25-30.
- SEGAL B, THOMAS W, ROGERS T *et al.*: Prevalence, severity, and predictors of fatigue in subjects with primary Sjögren's syndrome. *Arthritis Rheum* 2008; 59: 1780-7.
- GAIRY K, KNIGHT C, ANTHONY P, HOSKIN B: Burden of illness among subgroups of patients with primary Sjögren's syndrome and systemic involvement. *Rheumatology (Oxford)* 2021; 60: 1871-81.
- DAVIES K, MIRZA K, TARN J *et al.*: Fatigue in primary Sjögren's syndrome (pSS) is associated with lower levels of proinflammatory cytokines: a validation study. *Rheumatol Int* 2019; 39: 1867-73.
- RECKMAN GAR, GOMES-NETO AW, VONK RJ *et al.*: Anabolic competence: Assessment and integration of the multimodality interventional approach in disease-related malnutrition. *Nutrition* 2019; 65: 179-84.
- CASTREJÓN-MORALES CY: Omega-3 and omega-6 fatty acids in primary Sjögren's syndrome: clinical meaning and association with inflammation. *Clin Exp Rheumatol* 2020; 38 (Suppl. 126): S34-9.
- CRUZ-JENTOFT AJ, ROMERO-YUSTE S, CHAMIZO CARMONA E, NOLLA JM: Sarcopenia, immune-mediated rheumatic diseases, and nutritional interventions. *Aging Clin Exp Res* 2021 [Online ahead of print].
- VAN DER MEULEN TA, HARMSSEN HJM, VILA AV *et al.*: Shared gut, but distinct oral microbiota composition in primary Sjögren's syndrome and systemic lupus erythematosus. *J Autoimmun* 2019; 97: 77-87.
- CEDERHOLM T, BARAZZONI R, AUSTIN P *et al.*: ESPEN guidelines on definitions and terminology of clinical nutrition. *Clin Nutr* 2017; 36: 49-64.
- CEDERHOLM T, JENSEN JL, CORREIA MITD *et al.*: GLIM criteria for the diagnosis of malnutrition - A consensus report from the global clinical nutrition community. *Clin Nutr* 2019; 38: 1-9.
- DONINI LM, Busetto L, BAUER JM *et al.*: Critical appraisal of definitions and diagnostic criteria for sarcopenic obesity based on a systematic review. *Clin Nutr* 2020; 39: 2368-88.
- SEALY MJ, DECHAPHUNKUL T, VAN DER SCHANS CP *et al.*: Low muscle mass is associated with early termination of chemotherapy related to toxicity in patients with head and neck cancer. *Clin Nutr* 2020; 39: 501-9.
- JAGER-WITTENAAR H, DIJKSTRA PU, VISSINK A *et al.*: Malnutrition and quality of life in patients treated for oral or oropharyngeal cancer. *Head Neck* 2011; 33: 490-6.
- MULASI U, VOCK DM, JAGER-WITTENAAR H *et al.*: Nutrition status and health-related quality of life among outpatients with advanced head and neck cancer. *Nutr Clin Pract* 2020; 35: 1129-37.
- WOUTERS EJ, VAN LEEUWEN N, BOSSEMAER *et al.*: Physical activity and physical activity cognitions are potential factors maintaining fatigue in patients with primary Sjögren's syndrome. *Ann Rheum Dis* 2012; 71: 668-73.
- VAN DER MEULEN TA, HARMSSEN HJM, VILA AV *et al.*: Shared gut, but distinct oral microbiota composition in primary Sjögren's syndrome and systemic lupus erythematosus. *J Autoimmun* 2019; 97: 77-87.
- LOOMAN M, FESKENS EJ, DE RIJK M *et al.*: Development and evaluation of the Dutch Healthy Diet index 2015. *Public Health Nutr* 2017; 20: 2289-99.
- FREIJER K, TAN SS, KOOPMANSCHAP MA, MEIJERS JM, HALFENS RJ, NUIJTEN MJ: The economic costs of disease related malnutrition. *Clin Nutr* 2013; 32: 136-41.
- NESVOLD MB, JENSEN JL, HOVE LH *et al.*: Dietary intake, body composition, and oral health parameters among female patients with primary Sjögren's syndrome. *Nutrients* 2018; 10: 866.
- HAY KD, MORTON RP, WALL CR: Quality of life and nutritional studies in Sjögren's syndrome patients with xerostomia. *NZ Dent J* 2001; 97: 128-31.
- CERMAK JM, PAPAS AS, SULLIVAN RM, DANA MR, SULLIVAN DA: Nutrient intake in women with primary and secondary Sjögren's syndrome. *Eur J Clin Nutr* 2003; 57: 328-34.
- RHODUS NL: Qualitative nutritional intake analysis of older adults with Sjögren's Syndrome. *Gerontology* 1988; 7: 61-9.