Göteborg, 2021

Young adults with childhood-onset inflammatory bowel disease - aspects on bone mineral density, body composition and physical exercise

Akademisk avhandling
Som för avläggande av medicine doktorsexamen vid Sahlgrenska Akademin, Göteborgs Universitet kommer att offentligen försvaras i föreläsningssal 2119, Hus 2, Hälsovetarebacken, Arvid Wallgrens backe, Göteborg, den 6 maj 2021, klockan 9.00.

Av Vignir Sigurdsson

Fakultetsopponent:
Jørgen Jahnsen, Professor, Dept of Gastroenterology,
Akershus University Hospital and University of Oslo, Norge.

Avhandlingen baseras på följande delarbeten:

I. **Sigurdsson GV**, Schmidt S, Mellström D, Ohlsson C, Kindblom JM, Lorentzon M, Saalman R.
Bone Mass Development from Childhood into Young Adulthood in Patients with Childhood-onset Inflammatory Bowel Disease.
Inflamm Bowel Dis. 2017 Dec;23(12):2215-2226. PMID: 29064856.

II. **Sigurdsson GV**, Schmidt S, Mellström D, Ohlsson C, Karlsson M, Lorentzon M, Saalman R.
Altered body composition profiles in young adults with childhood-onset qinflammatory bowel disease.
Scand J Gastroenterol. 2020 Feb;55(2):169-177. PMID: 32008409.

III. **Sigurdsson GV**, Schmidt S, Mellström D, Ohlsson C, Karlsson M, Lorentzon M, Saalman R.
Physical exercise is associated with beneficial bone mineral density and body composition in young adults with childhood-onset inflammatory bowel disease. Manuscript submitted.

IV. **Sigurdsson GV**, Schmidt S, Mellström D, Ohlsson C, Saalman R, Lorentzon M.
A high proportion of young adult male patients with childhood-onset IBD have compromised cortical and trabecular bone microstructures.
Manuscript.

SAHLGRENSKA AKADEMIN
INSTITUTIONEN FÖR KLINISKA VETENSKAPER

GÖTEBORGS UNIVERSITET

Young adults with childhood-onset inflammatory bowel disease - aspects on bone mineral density, body composition and physical exercise

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Abstract

Background: Our research group has previously shown that low bone mineral density (BMD) is common in children and adolescents with inflammatory bowel disease (IBD). However, there is limited knowledge on the development of BMD and body composition traits (skeletal muscle and body fat) in early adulthood in this patient group.

Objective: The main objective of this thesis was to gain additional understanding of BMD and body composition in young adults with childhood-onset IBD.

Method: We performed a follow-up in young adulthood in 74 patients with childhood-onset IBD. Bone mineral density, skeletal muscle index (SMI), and fat percentage (fat %) were measured with dual X-ray absorptiometry. Body composition profiles were defined based on SMI and fat % Z-scores: i) normal, ii) obese, iii) myopenic, iv) myopenic-obese. Bone geometry and microstructures were estimated with high-resolution peripheral quantitative computed tomography. Physical exercise during the previous year was registered. Results were compared to normative control cohorts from nearby regions.

Results: Young adults, especially men with childhood-onset IBD, are at risk for low areal BMD and those young men also show widespread deficits in bone microstructures. Young adults with childhood-onset IBD have a risk for altered body composition traits with an overrepresentation of abnormal body composition profiles (myopenic, obese, and myopenic-obese) compared to controls. Young men with Crohn's disease have an especially high risk for myopenia. Despite the observed risk of having childhood-onset IBD, we found that high levels of regular physical exercise in young adulthood are associated with normal BMD and body composition traits.

Conclusion: Young adult patients with childhood-onset IBD are at risk for disturbances in BMD and body composition.

Keywords: IBD, BMD, Body composition, Physical exercise, HR-pQCT

ISBN: 978-91-8009-238-8 (Printed version)
ISBN: 978-91-8009-239-5 (Online version) http://hdl.handle.net/2077/67345