

ME-pasienter får sykdomsforverring ved belastninger

(Sist oppdatert 01.07.2019)

Studier har vist at ved to-dagers belastningstester (ergospiometri) klare ikke ME-pasienter å gjenskape sine egne måleresultater. På testdag 2 vil blant annet oksygenopptak og laktat være endret, sammenliknet med måleresultatene fra dag 1. Dette i motsetning til hva en finner i andre pasientgrupper. Endringene kan heller ikke forklares med dekondisjonering.

Laktat kan enkelt måles med små håndholdte laktatmålere (f.eks. Lactate Pro2 LT-1730, Lactate Scout 4, m.fl.) og selv moderate belastninger kan hos ME-pasienter gi høyere verdier enn normalt forventet.

Test-lab'er som tilbyr testing av laktat-profil/anaerob terskel erfarer at «hvileverdier» er like for idrettsutøvere og normalbefolkningen, vanligvis et sted mellom 0,7 og 1,3 mmol/l.

Olympiatoppen definerer i sin intensitetsskala forskjellige intensitetssoner.

Sone 1 : 0,7 - 1,7mmol/l : "En intensitet utøver kan opprettholde over flere timer"

Sone 2 : 1,7 - 2,6mmol/l : "En intensitet som godt trente utøvere kan opprettholde 100-150min."

Sone 3 : 2,6 - 3,6mmol/l : "En intensitet som godt trente utøvere kan opprettholde i ca 90-100 min."

Sone 4 : 3,6 - 5,8mmol/l : "En intensitet som en godt trent utøver kan opprettholde i 30-40 min."

Sone 5 : 5,8 - 8,7mmol/l : "En intensitet en godt trent utøver kan opprettholde i 8-10 min."

Sone 6 : 15 - 25mmol/l : Anaerob trening med tilnærmet maks. intensitet. Varigheten 30-120sek.

Sone 7 : 10 - 20mmol/l : Anaerob trening med maks. intensitet. Varigheten 15-30sek.

Sone 8 : 5 - 12mmol/l : Anaerob trening med maks. intensitet. Varigheten 3-15sek.

<https://www.olympiatoppen.no/fagstoff/talentutvikling/utviklingstrapper/orientering/intensitetsskala%20utholdenhet/page400.html>

Pasienterfaring

- Intervju med psykolog og tidligere topp-sykkelist Ingunn Ullerhaug

EKKO, NRK Radio 6. juni, 2019

<https://radio.nrk.no/serie/ekko/MDSP25011219/06-06-2019#t=21m40.08s>

Videoer og webinar som omtaler belastningstester og beskriver PEM

- David M. Systrom, MD, Director of the Massachusetts General Hospital Cardiopulmonary laboratory, Boston, Massachusetts. Assistant Professor of Medicine at Harvard Medical School
"Pathophysiology and treatment of exertional intolerance in ME/CFS: insights from cardiopulmonary exercise testing" 4. april, 2019
<https://youtu.be/1emsA2CcRK4?t=17636>
- Stipendiat Katarina Lien, Universitetet i Oslo
"Post Exertional Malaise in ME/CFS patients" 14. januar, 2019
<https://youtu.be/ol96vxqJ8rA>
- David M. Systrom, MD, Director of the Massachusetts General Hospital Cardiopulmonary laboratory, Boston, Massachusetts. Assistant Professor of Medicine at Harvard Medical School
"Advancements in ME/CFS Research, David M. Systrom, MD; Brigham and Women's Hospital | ME/CFSAlert 98" 2. juli, 2018
<https://m.youtube.com/watch?feature=youtu.be&v=FMaKfv8peww>

- Dr. Peter Rowe, professor i pediatri, John Hopkins sykehus, USA
“Inducing Post Exertional Malaise: A look at the research evidence” 16. juli, 2015
<https://youtu.be/ux93w7yGQ5g>
- Dr. Lily Chu, Stanford University, USA
“Post Exertional Malaise: History, Characteristics, Evidence” 23 juni, 2015
<https://youtu.be/hxJPrkWHcBo>
- Professor Christopher R. Snell, Pacific Fatigue Laboratory, Caleifornia, USA
“Making the case for clinical exercise testing in CFS/ME research and treatment” 23. september 2012
<https://m.youtube.com/watch?v=nL49DwGRs30&t=1s>
- Staci Stevens, MA in exercise physiology. Director of the Pacific Fatigue Lab, Founder and Director of Workwell Foundation, Ripon, California, USA
“MECFS Alert Episode 32” 6. august 2012
<https://m.youtube.com/watch?feature=youtu.be&v=kCO3pAbSq3l>

Referanser til studier

Abnormal blood lactate accumulation during repeated exercise testing in myalgic encephalomyelitis/chronic fatigue syndrome.

Lien K, Johansen B, Veierød MB, Haslestad AS, Bøhn SK, Melsom MN, Kardel KR, Iversen PO. *Physiol Rep.* 2019 Jun;7(11):e14138. doi: 10.14814/phy2.14138. PubMed PMID: 31161646; PubMed Central PMCID: PMC6546966. <https://www.ncbi.nlm.nih.gov/pubmed/31161646>

Chronotropic Intolerance: An Overlooked Determinant of Symptoms and Activity Limitation in Myalgic Encephalomyelitis/Chronic Fatigue Syndrome?

Davenport TE, Lehnen M, Stevens SR, VanNess JM, Stevens J, Snell CR. *Front Pediatr.* 2019 Mar 22;7:82. doi: 10.3389/fped.2019.00082. eCollection 2019. Review. PubMed PMID: 30968005; PubMed Central PMCID: PMC6439478. <https://www.ncbi.nlm.nih.gov/pubmed/30968005>

Whole blood human transcriptome and virome analysis of ME/CFS patients experiencing post-exertional malaise following cardiopulmonary exercise testing.

Bouquet J, Li T, Gardy JL, Kang X, Stevens S, Stevens J, VanNess M, Snell C, Potts J, Miller RR, Morshed M, McCabe M, Parker S, Uyaguari M, Tang P, Steiner T, Chan WS, De Souza AM, Mattman A, Patrick DM, Chiu CY. *PLoS One.* 2019 Mar 21;14(3):e0212193. doi: 10.1371/journal.pone.0212193. eCollection 2019. PubMed PMID: 30897114; PubMed Central PMCID: PMC6428308. <https://www.ncbi.nlm.nih.gov/pubmed/30897114>

Diagnostic sensitivity of 2-day cardiopulmonary exercise testing in Myalgic Encephalomyelitis/Chronic Fatigue Syndrome.

Nelson MJ, Buckley JD, Thomson RL, Clark D, Kwiatek R, Davison K. *J Transl Med.* 2019 Mar 14;17(1):80. doi: 10.1186/s12967-019-1836-0. PubMed PMID: 30871578; PubMed Central PMCID: PMC6417168. <https://www.ncbi.nlm.nih.gov/pubmed/30871578>

Cardiopulmonary Exercise Test Methodology for Assessing Exertion Intolerance in Myalgic Encephalomyelitis/Chronic Fatigue Syndrome.

Stevens S, Snell C, Stevens J, Keller B, VanNess JM.

Front Pediatr. 2018 Sep 4;6:242. doi: 10.3389/fped.2018.00242. eCollection 2018. PubMed PMID: 30234078; PubMed Central PMCID: PMC6131594. <https://www.ncbi.nlm.nih.gov/pubmed/30234078>

Physiological measures in participants with chronic fatigue syndrome, multiple sclerosis and healthy controls following repeated exercise: a pilot study.

Hodges LD, Nielsen T, Baken D.

Clin Physiol Funct Imaging. 2018 Jul;38(4):639-644. doi: 10.1111/cpf.12460. Epub 2017 Aug 7.

PubMed PMID: 28782878. <https://www.ncbi.nlm.nih.gov/pubmed/28782878>

Changes in Gut and Plasma Microbiome following Exercise Challenge in Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS).

Shukla SK, Cook D, Meyer J, Vernon SD, Le T, Clevidence D, Robertson CE, Schrodi SJ, Yale S, Frank DN.

PLoS One. 2015 Dec 18;10(12):e0145453. doi: 10.1371/journal.pone.0145453. eCollection 2015.

PubMed PMID: 26683192; PubMed Central PMCID: PMC4684203.

<https://www.ncbi.nlm.nih.gov/pubmed/26683192>

Inability of myalgic encephalomyelitis/chronic fatigue syndrome patients to reproduce VO₂ peak indicates functional impairment.

Keller BA, Pryor JL, Giloteaux L.

J Transl Med. 2014 Apr 23;12:104. doi: 10.1186/1479-5876-12-104. PubMed PMID: 24755065;

PubMed Central PMCID: PMC4004422. <https://www.ncbi.nlm.nih.gov/pubmed/24755065>

Decreased oxygen extraction during cardiopulmonary exercise test in patients with chronic fatigue syndrome.

Vermeulen RC, Vermeulen van Eck IW.

J Transl Med. 2014 Jan 23;12:20. doi: 10.1186/1479-5876-12-20. PubMed PMID: 24456560; PubMed

Central PMCID: PMC3903040. <https://www.ncbi.nlm.nih.gov/pubmed/24456560>

(Note! Ikke referert til i K Lien studie)

Discriminative validity of metabolic and workload measurements for identifying people with chronic fatigue syndrome.

Snell CR, Stevens SR, Davenport TE, Van Ness JM.

Phys Ther. 2013 Nov;93(11):1484-92. doi: 10.2522/ptj.20110368. Epub 2013 Jun 27. PubMed PMID:

23813081. <https://www.ncbi.nlm.nih.gov/pubmed/23813081>

Patients with chronic fatigue syndrome performed worse than controls in a controlled repeated exercise study despite a normal oxidative phosphorylation capacity.

Vermeulen RC, Kurk RM, Visser FC, Sluiter W, Scholte HR.

J Transl Med. 2010 Oct 11;8:93. doi: 10.1186/1479-5876-8-93. PubMed PMID: 20937116; PubMed

Central PMCID: PMC2964609. <https://www.ncbi.nlm.nih.gov/pubmed/20937116>

Postexertional malaise in women with chronic fatigue syndrome.

VanNess JM, Stevens SR, Bateman L, Stiles TL, Snell CR.

J Womens Health (Larchmt). 2010 Feb;19(2):239-44. doi: 10.1089/jwh.2009.1507. PubMed PMID:

20095909. <https://www.ncbi.nlm.nih.gov/pubmed/20095909>

Chronic fatigue syndrome: new evidence for a central fatigue disorder.

Georgiades E, Behan WM, Kilduff LP, Hadjicharalambous M, Mackie EE, Wilson J, Ward SA, Pitsiladis YP.

Clin Sci (Lond). 2003 Aug;105(2):213-8. PubMed PMID: 12708966.

<https://www.ncbi.nlm.nih.gov/pubmed/12708966>

Maximal oxygen uptake and lactate metabolism are normal in chronic fatigue syndrome.

Sargent C, Scroop GC, Nemeth PM, Burnet RB, Buckley JD.

Med Sci Sports Exerc. 2002 Jan;34(1):51-6. PubMed PMID: 11782647.

<https://www.ncbi.nlm.nih.gov/pubmed/11782647>

Folkehelseinstituttet, februar 2019

Kartlegging av forskning på anstrengelsesutløst sykdomsfølelse/symptomforverring (Post-Exertional Malaise, PEM) ved kronisk utmattelsessyndrom CFS/ME. Det er utført et systematisk litteratursøk, gjennomgått referansene fra søket og sortert relevante referanser i ulike kategorier.

<https://www.fhi.no/publ/2019/anstrengelsesutlost-sykdomsfolelsesymptomforverring-pem/>