



AQUATIC PHYSIOTHERAPY IN RHEUMATOLOGY: CURRENT EVIDENCE

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Aqua Therapy Exercise Program

Aquatherapy exercise programs (also called pool therapy, hydrotherapy, or aquatic therapy) consist of a variety of aquatic-based treatments and exercises that are designed for pain relief, muscle strengthening, development of coordination and condition



Aqua Therapy Exercise Program

Exercises in water are quite different in their method from land-based exercises. Influenced by hydrodynamic effects and temperature of the water





Hydrodynamic effects and principles

- Density
- Turbulence
- Speed of the movements in the water
- Size and shape of the moving objects
- Friction
- Hydrostatic pressure
- Metacentre





Temperature of water

- Warm water provides the sedative and relaxation effects, thus decreasing the tonicity of muscles
- Cold water stimulates the motor neurons, thus increasing the tonicity of muscles





Aquatic Physiotherapy In Rheumatologic Conditions

- Decreased joint stiffness
- Increased collagen extensibility in tendons
- Pain relief
- Pain threshold elevation
- Muscle spasm relief
- Increased circulation
- Increased diuresis and cell metabolism



Systematic Reviews & Recommendations

Systematic reviews and recommendations referring to rheumatoid arthritis;

- *J.Geytenbeek 2002
- *EULAR Recommendations early arthritis 2006
- *J.Hall 2008
- *j.Geytenbeek 2008
- *Verhagen 2008
- *Kamioka 2010
- *S.Batterham 2011
- *Al-Qubaeissy KY. 2013



J.Geytenbeek

Physiotherapy,88,9,514-529,2002

- Evidence for effective hydrotherapy
- The balance of high to moderate quality evidence supported benefit from hydro in pain,function,self-efficacy and affect,ROM,strength and balance,especially among older adults,subjects with rheumatic conditions and chronic low back pain.



EULAR

Recommendations for the management early arthritis.B.Combe et al. Ann Rheum Dis 2007,66,34-45

➤ **Recommendation 11**

>Non-pharmacological interventions such as dynamic exercises,OT,and hydrotherapy can be applied as treatment adjunct to pharmaco-logical interventions in patient with early arthritis

>However;references refer to 2 meta-analyses about passive immersion in balneotherapy



SR And Meta-analysis

Hall J. Et al,APMR 2008

- Is hydrotherapy an effective treatment for relieving pain?
- How does pain relief in hydrotherapy compare with other interventions?
- 19 RCT's included:3 on RA and RA/OA
- Ahern 1995,Rintala 1996,Bilberg 2005

Ahern (1995)

- Randomised 30 patients with rheumatoid arthritis or osteoarthritis
- n=22 received a four day hydrotherapy course
n=8 no intervention control group

Self-reported pain was significantly improved in the water exercise group compared to the no exercise controls however this did not translate to difference in self-reported function, quality of life or target ROM between groups.

Rintala et al (1996)

- Randomised 34 patients with RA
- Aquatic exercise (n=18) control(n=16)
- The aquatic exercise undertook a routine to improve aerobic power, muscle strenght,endurande,and joint mobility in sessions of 45 to 60 mins twice a week for 12 weeks.
- The control group received no additional exercise
- The aquatic exercise group reported a significant reduction in pain compared with control

Bilberg et al (2005)

- 46 patients with chronic RA
- Pool twice a week for 12 weeks (n=20)
No additional exercise (n=23)
- Each session was 45 min, moderate aerobic intensity, it comprised exercise for aerobic, dynamic and static muscle strength, muscle endurance UE and LE, flexibility, coordination and relaxation.



Findings:

- The primary study outcomes, aerobic capacity and SF-36 no difference between group
- At six month follow up, the group randomised improvement in exercise tolerance



Summary of Findings:

- There is evidence of a beneficial effect of hydrotherapy on pain
- Inconsistent findings between studies
- Sound evidence of no difference in pain relief between hydrotherapy and land-based exercise

Geytenbeek J. (2008) Aquatic Physiotherapy Evidence Based Practice Guide. Australian Physiotherapy Association

Positive Effects of hydrotherapy

RA(4)

- *Disability
- *Ambulation
- *Strenght ss
- *Pain
- *Balance
- *Quality of life
- *Health
- *Disease activity

RA&OA (3)

- *Strenght
- *ROM, Flexibility
- *Balance
- *Adherence

Verhagen et al, Balneotherapy or Spa-therapy for RA (2008)

- The review shows that in people with RA,
- Radon-carbon dioxin baths compared with carbon dioxin baths may not lead to any differences in pain on the short time, only 6 months
- Mineral baths compared with taking the drug Cyclosporine A may lead to a significant difference in pain at 8 weeks, but also some side effects
- Tap water baths compared to land exercises or relaxation may not lead to any difference in pain



Kamioka H. Et al, Effectiveness of Aquatic Exercise and Balneotherapy, J Epidemiologia 2010;20(1):2-12

- Systematic review based on randomized clinical trials (with or without a meta-analysis)were eligible.
- Studies included;
 - Aquatic exercise or balneotherapy
 - ROM, dynamic exercise, aerobic exercise, only immersion

Articles

- Bartels EM,et al.(2007) Aquatic exercise for the treatment of knee and hip OA
- Verhagen AP,et al (2008)Balneotherapy for RA
- Forestier R.et al (2008) Crenobalneotherapy for limb OA
- Pittler MH, et al,(2006)Spa therapy and balneotherapy for treating low back pain.
- HallJ,et al(2008) Does aquatic exercise relief pain in adults with neurologic or musculoskeletal disease?
- Kamioka H.et al,(2006) A systematic review of randomized controlled trials on the therapeutic and health –promoting effects of spas.



Overall Evidence And Future Research Agenda

Intervention	Evidence	Specific Agenda	Common Agenda
Aquatic Exercise	Small but significant effect(no differences between aquatic exercise and land exercise	1.Long term 2.Type of dose(intensity, frequency and Duration)	1.Randomized controlled trials for various disease 2.Cost-benefit analysis 3.Description of adverse effects
Balneo therapy	Satisfactory methodology(intention-to-treat analysis,blinding,adequate control group.		



Batterham S.et al,BMC Musculoskeletal Disor,2011;12:123

This review assessed the relative advantages of aquatic exercise and land based exercise for people with arthritis on the outcomes of function or mobility.



Included Studies

- Gill (2009)
- Lund (2008)
- Silvia(2008)
- Everdsen (2007)
- Fransen(2007)
- Foley (2003)
- Suomi (2003)
- Wyatt(2001)
- Smith(1998)
- Hall(1996)



Conclusion

- Overall aquatic and land based exercises appeared to result in comparable outcomes for participants.
- Meta-analysis did not provide confidence that either aquatic or land based exercise provide better function or mobility outcomes.
- Variability in study parameters, study quality and exercise interventions may have contributed random error to outcomes.
- Three high quality trials each found no significant difference in outcomes for land compared to aquatic exercise.





Recoomendation For Clinical Applications

- For people who have significant mobility or function limitations and are unable to exercise on land, aquatic exercise appears to be a legimate alternative that may enable people to succesfully participate in exercise.

AL-Qubaeissy KY.et al,Musculoskeletal Care ,2013 March;11(1):3-18

- AMED,CINAHL,EMBASE,MEDLINE,PubMed,Science Direct and Web of Science were searched between 1988-2011.
- Results;
 - 197 studies were identified.
 - Most of the studies reported favourable outcomes for a hydrotherapy intervention compared with no treatment or other interventions for patients with RA.
 - Improvement was particularly noted in reducing pain,joint tenderness,mood an tension symptoms,and increasing grip strenght and patient satisfaction with hydrotherapy in the short term.



EVALUATION Of HAND FUNCTIONS AND QUALITY Of LIFE(SF-36)IN RHEUMATOID ARTHRITIS PATIENTS

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Material –Method:

- 125 Norwegian cases with RA
- Combine therapy 3 weeks(3 active,2 passive)
- Active therapy;
 - Aquatherapy; 5 days a week,30 min,aerobic,ROM,strengjhtening,balance training
 - Land exercise;5 days per a week,30 minute,ROM,strenghtening,stabilization,ball exercise and balance training
 - Individual therapy;5 days per a week,ROM,strenghtening,stabilization>manual therapy,hand skill training,balance exercise and gait training.
 - land exercise and individual exercise
- Passive treatments;paraffin and massage
- Assessment
 - Demographic variable
 - Disease duration
 - Functional classification(ACR)
 - Hand measuruments(grip strenght,distance between tip of finger and their bases (DTFB))

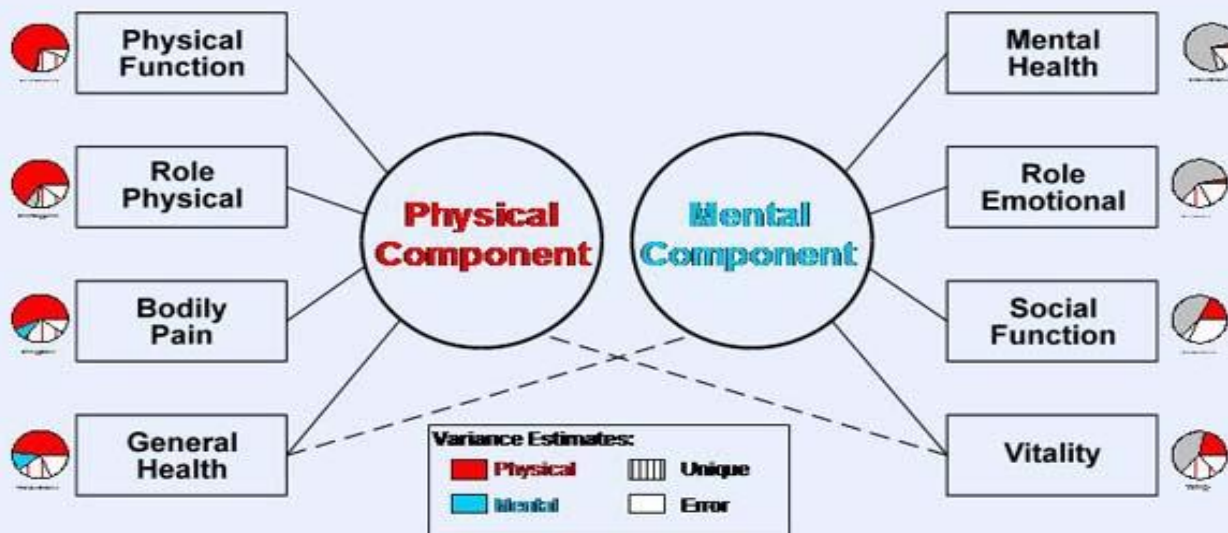


SACRAH Questionnaire

(Score for Assessment and Quantification Chronic Rheumatic Affections Of Hands)

- Hand functions (17 questions):locking a door,turning the handle of door,writing,cutting with a kitchen-knife e.g.
- Morning stiffness (2 questions)
- Pain(4 questions)

SF-36® Scales Measure Physical and Mental Components of Health

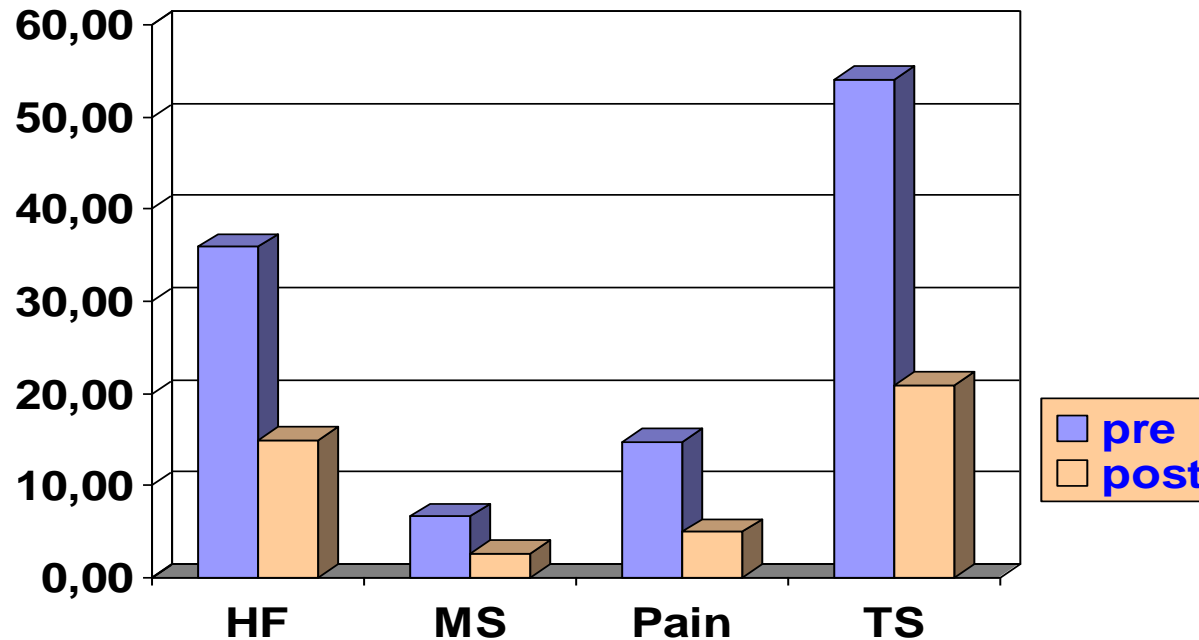


Source: Ware, Kosinski, and Keller, 1994

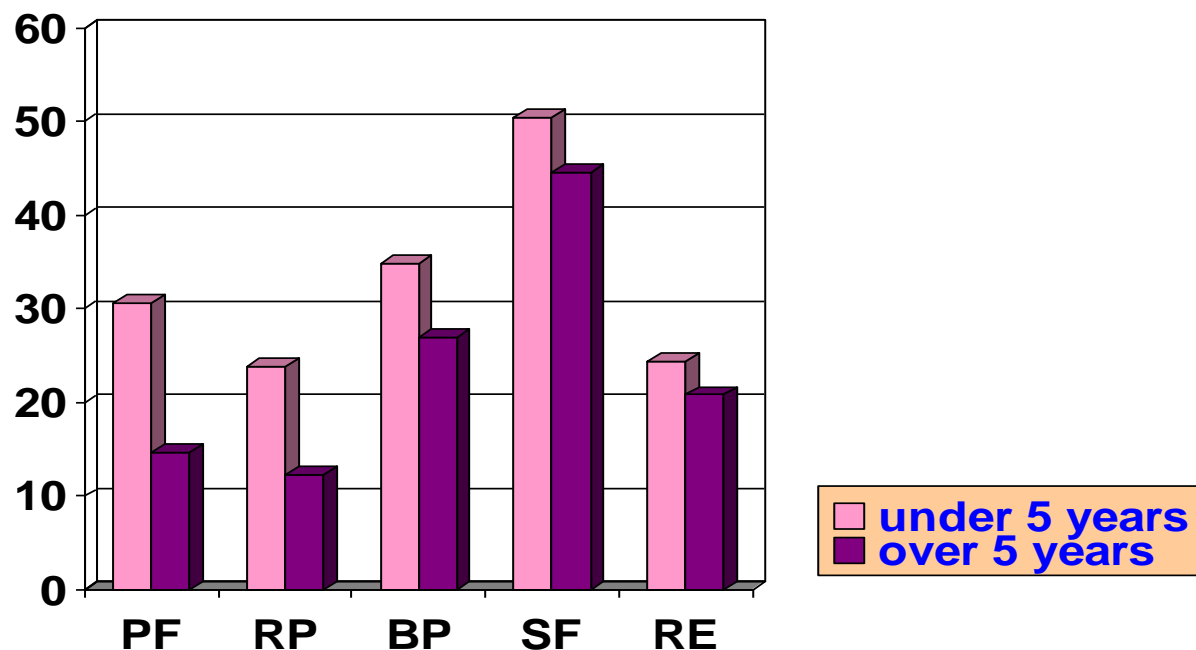



RESULTS

Comparing Scores of SACRAH total and subscale pre and post treatment



Comparing Scores Of SF-36 Subscale According To Disease Duration





PF,BP,GH and SF subscale scores
were determined significantly higher in
cases who have functional class I and II
than III





Systematic Review And Recommendations Refer To Ankylosing Spondylitis


- Dagfinrud H.(2009),Physiotherapy for ankylosing spondilitis
- Passalent L.(2011),Physiotherapy for ankylosing spondylitis:evidence and application



Dagfinrud H. et al (2009), Physiotherapy of ankylosing spondylitis

- How well does physical therapy work for treating ankylosing spondylitis and how safe it?
- What is ankylosing spondylitis and how can physical therapy help?
- How well does physical therapy work?




- 
- Individual and supervised exercises program improve spinal movement more than no therapy.
 - Group exercise improve movement in the spine and overall well being, but did not improve physical function more than home exercises.
 - To compare group exercise and group exercise+spa aqua physiotherapy
 - Aquatherapy plus weekly group exercise improves pain and overall well being more than just weekly group exercise

Laura Passalent(2011),Physiotherapy for ankylosing spondylitis:evidence and application

➤ This review;

- ✓ Exercise and AS
- ✓ Spa therapy and AS
- ✓ Manual therapy and AS
- ✓ Elechtrotherapy and AS

Current Opinion Rheumatologu,2011,23


- 
- Compared combine therapy spa rehabilitation and enbrel group versus enbrel alone group.
 - Result;improvement function and quality of life combination therapy group at 3 monts postintervention and this improvements were maintained at 6 months postintervention.





Yindis A. Et al (2011), Efficacy of Rehabilitation For Patients With Ankylosing Spondylitis: Comparison of A Four-Week Rehabilitation Programme

J Rehabil Med 2011;43:534-542

- 
- The compared 4 weeks rehabilitation programme in Norway and similar treatment programme Mediterranean country(Institute Igola in Montenegro or Balçova Thermal Therapy Center in İzmir)

4 Weeks rehabilitation programme

- Active physiotherapy;
 - Individual exercise
 - Land group exercise
 - Pool group exercise
- Passive physiotherapy
 - Thermotherapy
 - Massage
 - Electrotherapy

Active Physiotherapy Programme

Pool gym and group gym;

- 45 + 45 min in daily 5 times a week Balçova
- 30 +30 min in daily in Tromso and Lillhammer
- 30 + 20 min in daily 5 times per a week pool gym, 7 times per a week group gym



Individual Therapy

Exercise therapy aimed at increasing endurance, mobility and strength.

- Norwegian programme included more endurance training
- Mediterranean programme had more on mobility.

Method

- All patients were examined before and after treatment, and after three months and 6 months later .
- Demographic data, ASAS -IC, BASFI, BASDAI, VAS for pain, fatigue and morning stiffness.

Results:

- No differences in efficacy of rehabilitation in a Mediterranean or Norwegian setting.
- All variables significantly improved after treatments all groups.
- At the 3 months after therapy, all examined variable, except spinal pain, chest expansion and ESR, improved significantly among patients both study groups
- After 6 months, all patients assessments were still significantly improved in the mediterranean group, but not in the Norwegian group.



Conclusion

- Patients with AS had a sustained positive effect of a 4 week rehabilitation programme both in a Mediterranean and Norwegian setting.
- The improvements in the patient's assessments of health status and spinal mobility measures were larger and better maintained at least 3 months after rehabilitation in Mediterranean setting.
- Future studies are needed to ascertain the most important contributing factors to these differences.

Relation Between The Lumbal And Cervical Mobility In Patients With Ankylosing Spondylitis

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Method

- N=197 Ankylosing Spondylitis Patients
- 20 session combined therapy; 3 active, 3 passive

Active therapy;

Pool group gymnastic 30 minute /33-35 °C

Land group gymnastic 30 minute

Individual therapy 30 minute

Passive therapy;

Paraffin an massage 10 minute



Method

- Pain, morning stiffness and fatigue evaluated by VAS
- BASMI index
- ROM, muscle strength, muscle shortness evaluated before and after treatment.



Results:

- Tragus-wall distance, left cervical rotation, VAS and morning stiffness values decreased after treatment.
- Schober, lumbal side flexion and thorax expansion values are increased after treatment.
- The combined treatment program for the AS patients increases the cervical and lumbal mobility. There is a relation between cervical and lumbal mobility in AS patients.
- There is quite significant correlation between the tra-wall and schober measures, pain and morning stiffness.



THANKS...





