Consensus agreement - the CUT-N-MOVE trial

Consensus agreement on interpretation of the primary outcome by authors of: Progressive early passive and active exercise therapy after surgical rotator cuff repair – a randomized controlled trial (the CUT-N-MOVE trial)

Kjær, Birgitte Hougs; Magnusson, Peter; Henriksen, Marius; Warming, Susan; Boyle, Eleanor; Krogsgaard, Michael ; Al-Hamdani, Ali; Juul-Kristensen, Birgit

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Consensus agreement on interpretation of the primary outcome by authors of:

Progressive early passive and active exercise therapy after surgical rotator cuff repair – a randomized controlled trial (the CUT-N-MOVE trial)

Birgitte Hougs Kjær [1, 2], Peter Magnusson [3], Marius Henriksen [1, 4], Susan Warming [1], Eleanor Boyle [2], Michael Krogsgaard [5], Ali Al-Hamdani [6], Birgit Juul-Kristensen [2]

[1] Department of Physical and Occupational Therapy, Bispebjerg and Frederiksberg Hospital, Bispebjerg Bakke 23, DK-2400, Copenhagen, Denmark.
[2] Department of Sports Science and Clinical Biomechanics, University of Southern Denmark, Campusvej 55, DK-5230 Odense, Denmark.
[3] Institute of Sports Medicine, Department of Orthopaedic Surgery M, Copenhagen Bispebjerg and Frederiksberg Hospital, and Center for Healthy Aging, Faculty of Health and Medical Sciences, University of Copenhagen, Copenhagen, Denmark.
[4] The Parker Institute, Bispebjerg and Frederiksberg Hospital, Ndr. Fasanvej 57, DK-2000 Frederiksberg, Copenhagen, Denmark.
[5] Section for Sports Traumatology M51, Department of Orthopaedic Surgery, Bispebjerg and Frederiksberg Hospital, Bispebjerg Bakke 23, DK-2400, Copenhagen, Denmark.
[6] The Shoulder-Elbow Unit, Department of Orthopaedic Surgery, Herlev-Gentofte Hospital, Kildegårdsvej 28, DK-2900 Hellerup, Copenhagen, Denmark

Correspondence
Birgitte Hougs Kjær (PI), Bispebjerg and Frederiksberg Hospital, Department of Physical and Occupational Therapy, Bispebjerg Bakke 23, DK-2400 Copenhagen NV, Denmark, Phone +45 2149 0805, birgitte.hougs.kjaer@regionh.dk.

Introduction

This study focuses on the postoperative rehabilitation in patients with surgically repaired rotator cuff tear with the intention to optimize the postoperative rehabilitation intervention and improve patient perceived physical pain, function and health-related quality-of-life.
The hypothesis is that 12 weeks of progressive early active movement (PR) protocol postoperatively is superior to 12 weeks of limited early passive movement (UC) protocol ('care as usual') on the primary outcome (WORC physical symptoms subdomain), as described in the study protocol (1).

Aim

The aim of this paper is to document a consensus agreement on the interpretation of the results of the primary outcome (WORC physical symptoms subdomain), while all the authors of the primary outcome paper are all blinded as to the intervention and control group identification, as recommended (2).

Methods

The primary outcome (WORC Physical) is one subdomain in a patient-reported outcome questionnaire consisting of 21 items in 5 domains: physical symptoms (6 items), sports and recreation (4 items), work (4 items), lifestyle (4 items) and emotions (3items). Each question is scored on a 100 mm visual analogue scale (4) and summed to a total score for each domain, the raw score is inverted and converted into a percentage. A percentage score is reported for each domain and ranges from 0 (worst possible) to 100 (best possible).

The primary analysis of the WORC physical symptoms will be performed based on Intention-To-Treat (ITT) by a repeated measures analysis of covariance (ANCOVA), including change in WORC physical symptoms as dependent variable, with group (intervention, control), time (6 and 12 weeks), baseline WORC physical symptoms as independent variables, and age, gender and center as confounders (Group A and B have *equal/ very few/ no drop-outs,* resulting in the missing observations randomly divided between groups adding no selection bias to the results). ANCOVA was not invalidated and therefore appropriate to do. There are no missing data parts on selfreported outcomes at baseline due to the electronic nature of this outcome. In case of any missing follow up data baseline observation carried forward (BOCF) will be used. Sensitivity analysis between responders and non-responders (those who comply and those lost to follow-up and) will be carried out. The statistical analysis plan is available on request/ on the WEB page of the research unit (REF).

Results

Group A and B represent either progressive early active movement (PR) or limited early passive movement (UC) protocol with authors and statistician blinded to group status.

Reults of the primary outcome are:

	A mean change (SD)	B mean change (SD)	Diff mean change A minus B (mean) 95% CI	P-value ANCOVA
WORC Physical				

Group *XX* improves *0.00* points on WORC Physical compared to group *XX*, and statistically significantly/not significantly on ANCOVA.

Conclusions

Overall: The ANCOVA did/ did not show significant between-group difference in WORC Physical symptom change score. With a change score of XXXX on WORC, both groups improved/ did not improve significantly from baseline to follow-up (within-group difference) with a clinically important level (minimal clinical important difference (MCID)) of 12 points)(1, 3). The groups did/ did not change within the MCID. The drop-out rate was/ was not equal in both groups. Compliance of the supervised sessions *was/ was not* significantly different between groups, and compliance of home-based exercises (from exercise diary) *was/ was not* significantly different between groups.

Discussion

Following topics are suggested as points of discussion.

PR (A) – UC (B) (B improved most, *but not/ and* also significantly more)

Interpretation of the results, based upon the ANCOVA analyses with A as PR (progressive early active movement) and B as UC (limited early passive movement): showing B (UC) to improve WORC Physical significantly more than A (PR).

1) If drop-outs/ lost-to-follow-ups in A are mainly those improving most, results will move toward a larger effect of the UC. If drop-outs in A are mainly those improving least, the results will move toward a smaller smaller effect of the PR.

2) PR does not improve WORC Physical more than UC meaning UC is as effective as PR. It may also be that the UC (limited early passive movement) was just as effective compared with PR (progressive early active movement) when measured on self-percieved physical function (WORC Physical). Or the rehabilitation itself is an insignificant addition to the natural course of tendon healing following surgical repair.

3) The WORC Physical subdomain may not fully cover self-percieved improvements, since its only one subdomain out of five. The remaining subdomains; sports and recreation (4 items), work (4

items), lifestyle (4 items) and emotions (3items) is therefore also relevant to pay attention to. Also, the majority of studies reporting change in WORC, report total WORC score and not subdomains, and *no/ only few* studies report WORC Physical subdomain (as primary outcome) after 12 weeks of intervention (here: postoperative).

4) PR protocol may not have had sufficient intensity or frequency to induce improved WORC Physical superiorly to UC. Compliance to home-based exercises (from exercise diary) was not sufficient to show a larger effect than the UC protocol.

5) PR protocol may have induced extra pain due to the progressive early active movements and as a result the patients may have been reluctant to exercise as a fear avoidance which could result in a larger effect in the UC protocol

5) Compliance in the PR group is not measurable lower than UC. This may be due to the PR protocol being more time consuming than the UC protocol (8 more visits to the physiotherapist (26 vs 18)) which may affect motivation for rehabilitation/ exercise in the PR group (not measurable lower compliance).

6) Patients performing frequent and intensive (and supervised) postoperative rehabilitation (PR group) focus more on their shoulder problem and may have higher expectations on improvement resulting in disappointment. On the contrary, less frequent and intensive (although also supervised) postoperative rehabilitation (UC group) may be less confrontational on pain and physical problems and patients may to a higher extent develop an acceptance of the situation.

7) Compliance in PR versus UC with a higher compliance in one group could be an issue. A potentially higher UC group compliance rate (measurable) may contribute to a better outcome in the UC group.

8) Despite reaching the estimated sample size the sample size of 41 per group may not have sufficient power to show significant effect of the actual group difference (xx point in change score), due to larger between- and within-group variation. As described in the protocol (1) the study was powered to detect a group difference in the mean changes from baseline on 12 points, corresponding to the MCID with a sample of 41 per group.

9) There was a statistically significant between group difference, however not within MCID/ MDC.

PR (B) - UC (A) (B improved most, *but not/ and* also significantly more)

Interpretation of the results, based upon the ANCOVA analyses with B as PR (progressive early active movement) and A as UC (limited early passive movement): showing B (PR) to improve WORC Physical significantly more than A (UC).

1) If drop-outs/ lost-to-follow-ups in A are mainly those improving most, results will move toward a larger effect of the PR. If drop-outs in A are mainly those improving least, the results will move toward a smaller effect of the UC.

2) PR protocol improves shoulder function as measured by self-percieved physical function (WORC Physical) more than UC due to a positive effect of the progressive early active movement strategy, aiming at optimizing tendon healing processes. This means that improvement of range of motion and discomfort and reduction in pain create improved WORC Physical.

3) The progressive early active movement strategy/ protocol optimally supervises the patients on their performance including feedback on improvement or worsening. Patients experience a high degree of self management and self efficacy regarding their shoulder impairment with PR. This may explain the improvements of range of motion and discomfort, besides reduction in pain (WORC Physical).

4) Contextual effects in PR is expected to be larger as the patients have an expectation that they will gain/ improve more by the progressive early active movement protocol.

5) A potentially higher PR group compliance rate (also home-based exercises) may contribute to a better outcome in the PR group compared to the UC group.

6) The total amount of physiotherapy supervised training sessions was 26 (PR) vs 18 (UC) (8 more visits to the physiotherapist) which could induce an attention bias with those in the PR group being positively influenced by the contact with the physiotherapist.

7) Also during the 4 weeks (week 2, 3, 4 and 5 postop) with discrepancies between protocols, the UC group were instructed to do home-based exercises more frequently (both groups were instructed to do home-based exercises on days without visits to the hospitals). There may be barriers regarding the implementation of home-based exercises and therefore the UC group (instructed to do home-based exercises 6 days per week) may have a poorer training compliance with less total training compliance (also due to possible incorrect interpretation of the instructions, lack of energy, fear avoidance of movement or previous poor training experience). This may all lead to worse shoulder function in the UC group, compared to PR.

8) There was a statistically significant between group difference, however not within MCID/ MDC.

9) There was not a statistically significant between group difference.
Nevertheless, within-group changes are of clinically relevant size for both groups.

Perspectives

There *was a/ was no* group difference in the change scores on WORC physical symptoms (as measured by WORC Physical). There *was a/ was no* group difference in the change scores on WORC subdomains; sports and recreation, work, lifestyle and emotions. Progressive early active movement protocol and limited early passive movement protocol *are/ are not* equally relevant when the outcome measure is WORC Physical. However, both groups were effective/not effective in reducing physical symptoms (WORC Physical) corresponding to a clinically relevant level/MCID.

Consensus of co-authors:

Approved the above interpretations and perspectives of the results:

Date	Name	Title	Signature
1/7 2019	Birgitte Hougs Kjær	Ph.D fellow	
	Peter Magnusson	Professor, PT	
4-7-2019	Marius Henriksen	Professor, PT	
	Susan Warming	Ph.d. senior researcher	
09-07-2019	Eleanor Boyle	Associate professor	
	Michael Krogsgaard	Professor, MD	
	Ali Al-Hamdani	MD	
05-08-2019	Birgit Juul-Kristensen	Associate Professor	Birgit Juul-Kristensen

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