Proposal of a Home Based Core Strengthening Exercise Program for Patients Suffering from Chronic Non Specific Low Back Pain

Margaret Saxon, MS4
Mentor: Adele Meron, MD

Background

- Approximately two thirds of adults have or will be affected by low back pain and the prevalence in working-age adults is estimated at 19.60%.[3]
- When core muscles function normally, they maintain segmental stability, protect the spine, and reduce stress of the lumbar vertebrae and intervertebral discs.[5]
- Abnormalities of the core muscles such as the lumbar multifidus, transverse abdominis and quadratus lumborum have been associated with low back pain.[2]
- Core stabilisation exercise (CSE) is a popular option in restoring functions of trunk muscles to achieve optimal lumbar stability during daily activities.[3]

Purpose

- Evaluate the effectiveness of core strengthening exercises in alleviating non-specific low back pain symptoms.
- Propose a structured, home-based exercise program as a cost-effective and accessible alternative for patients facing barriers to traditional physical therapy.

Methods

- The randomized controlled trials for this review were identified through a search in PubMed using key terms such as ‘core strengthening’, ‘core stabilization’, ‘core stability’, ‘non-specific low back pain’, ‘chronic low back pain’, and ‘home based exercise’.
- Inclusion criteria required that studies gave a regimen of core strengthening exercises to the experimental group and that they specifically looked at the effects it had on non-specific back pain.
- Exclusion criteria included trials that focused on specific populations, for example ‘core muscle strengthening in patients with low back pain after C-section’ or studies that focused on athletes in various sports.

Results

- Despite there not being a widely determined consensus on what core strengthening exercise programs entail, all papers that used core strengthening exercises and showed statistically and clinically significant improvement in low back pain symptoms had the following general framework:

  1. Teaching patients how to move into a neutral spine position.
  2. Gaining neuromuscular control of the local stabilizers.
  3. Stabilization exercises to promote co-contraction of local and global stabilizers.
  4. Dynamic functional activities that require and challenge core stability.

- This framework was used to come up with the proposed home based exercise program outlined below. Since patients will not be working one-on-one with a physical therapist for the majority of their sessions, the program is slightly longer than the programs in the research trials for a total of eight weeks to account for extra time needed to get used to the movements and progressions.

Phases (each 2 weeks, 3x per week)	**Phase 1**	**Phase 2**	**Phase 3**	**Phase 4**
Goal	Neutral spine control, isolated isometric contraction of stabilizing muscles	Co-contraction of the transverse abdominis and lumbar multifidus	Addition of heavier loads	Addition of unstable surfaces
Exercises	Pelvic tilts, quadruped, cat-cow, abdominal draw-in	Big 3: curl-up, side bridge & bird dog. Planks, supine bridge	Single limb dead bugs, bridging exercises, side plank progressions	Alternating dead bugs, glute bridge and single leg bridge with swiss ball
Sets & Reps	2 exercises: 3 sets of 8 reps each	3 exercises: 3 sets of 8 reps each	5 exercises: 3 sets of 8 reps each	5 exercises: 3 sets of 8 reps each
Duration	15 minutes	20 minutes	30 minutes	30 minutes

Supplemental Resources (to improve adherence and effectiveness): instructional follow along videos, biofeedback tools, progress trackers and weekly check-ins via text or virtual video appointments.

Conclusions

- Home based exercise programs focused on core strengthening exercises would be a cost effective and convenient way to alleviate the physical, emotional and psychosocial burden on individuals suffering from low back pain.

Future Directions

- Next steps for this project are to create easy to follow videos and supplemental resources so it can be given to clinic patients who present with chronic low back pain and are unable to attend physical therapy due to various personal barriers.
- Future studies should be done to continue to study the effectiveness of a home based core strengthening program at home and compare various supplemental resources that may improve adherence and clinical outcomes.

References

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