Original Research

Myriah Lynn, Biomechanics Specialist from USA kindly shares with us her research on importance of flexibility in rowing:

Rowing is a total body exercise that requires muscles throughout the body to work together and produce an efficient stroke. If one area of the body is not working optimally, or if different areas of the body are not working together efficiently, overall rowing performance could potentially suffer. Furthermore, misalignments can put additional undue stress on the body and leave it vulnerable to injury. For example, the hamstrings, gluteus, and muscles in the lower back are all connected. Tightness in any of these areas puts additional strain on the other areas, including the back. As is commonly known, a rounded back during exertion (e.g., lifting objects) greatly increases the risk of injury (McGregor, RBN 2005/07). Applying the principles of Biomechanics to help lengthen muscles, improve posture, and help the body work more efficiently as a unit could potentially improve performance.

To test whether a Biomechanics program would have a positive impact on rowing performance, we conducted a preliminary study with a college, NCAA rowing team in southern California, USA. Some of the athletes on the team were put through a six-week Biomechanics program that focused on stretches and exercises to lengthen muscles and to engage core muscles during daily movements and rowing strokes. It was posited that lengthening and strengthening these muscles would reduce the obstacles that can cause rounding of the back, thereby increasing an athlete's ability to use proper rowing technique.

Because this was a preliminary study, a simple sit-and-reach test (SnR) was used to get an objective, quantified measure of tightness of the calves, hamstrings, gluteus, and back before and after the program. Athletes who did not go through the program were also tested at these times.

Fig. 1. Sit-and-reach test (SnR) test.

All athletes were administered a 6km test on Concept2 rowing ergo within one week of the end of the program. The athletes' total times are split to show the average 500 meter time.

Results. The athletes who did participate in the program showed a 2.25cm greater improvement in their SnR than those who did not. Split rowing times and SnR were also found to have a significant correlation (Fig.2).

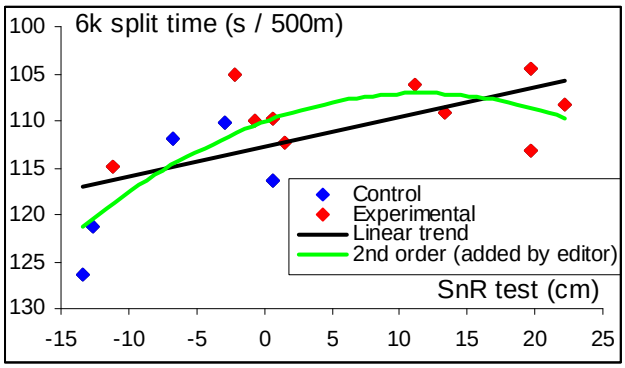

Fig. 2. 6k split (s) relative to Sit and Reach (cm), both taken at the end of the Biomechanics program. ($r = -0.63$, $p<0.01$).

These finding suggest that flexibility of hamstrings, gluteus and lower back muscles positively correlates with rowing performance to a significant degree. A Biomechanics program can improve an athlete's flexibility.

There are likely many other factors that affect rowing performance and one should not draw too broad of conclusions based on these preliminary findings. The findings do, however support the position that an understanding of Biomechanics, including how different muscle regions interact, and, more importantly, having effective methods to train athletes in Biomechanics can help remove physical obstacles that might otherwise impede rowing performance. We are working to conduct further studies that allow for more causal conclusions.

Comments from the editor. We added a non-linear 2nd order polynomial trend line to the author's data, which produced a higher correlation ($r=-0.78$) and a peak at +10-12cm SnR. This can be interpreted that the flexibility should be at optimal level and too high flexibility could be negatively related to performance.

Obviously, this is a very preliminary study and it requires further research. Effect of the training program has to be studied on larger sample. However, the results are quite interesting and can give an idea to coaches to pay more attention to development of flexibility in rowers.

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