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Cross Education Exercise and Injury Recovery

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Research supports the premise that exercising soon after an injury can actually speed up the healing process. In a 1995 study by Gregory, et al.,¹ laboratory rats received a contusion injury to the hamstring muscle, and were then sorted into five groups. One group (the control) was not exercised. Two groups were returned to their cages to rest for 72 hours, and then started exercising (one group began swimming daily; the other began running every day). The final two groups began their swimming or running exercises within an hour of being injured.

Results by Group

The four rat groups which exercised all showed earlier resolution of their injuries than did the control (no exercise) group. The immediate (same day) exercisers showed more rapid healing responses than those who rested for three days. Surprisingly, the data indicated that the injuries in the running group were resolving much more quickly than those of the swimmers. In fact, the study concluded: "Running with immediate onset is the regimen of choice. Any of the given exercises is preferable to no exercise, immediate onset of exercise is preferable to delayed onset, and running is preferable to swimming."¹

Clinical Impact

The Gregory, et al., study results may impact on the methods of rehabilitative exercise therapy we perform in our clinics. However, keep two important facts in mind: First, many of our acute injury patients are trying to repair a sprain/strain type of injury, not a contusion. Strains and sprains involve tissue tears, while contusions produce a crushing of tissues. When tissues are torn, some period of decreased or restricted activity is needed to allow for early repair of the tear by fibroblasts. The injuries sustained by the rats in the above study may be quite different from most injuries many chiropractors deal with, especially those found in the spine.

Second, the time the lab rats spent swimming or running was 15 minutes every day in all exercise groups. It's possible that longer periods of exercise may have worsened the damage and delayed healing, rather than speeding the process. More research is needed to clarify these concerns.

Cross Education Exercise

"Cross education" is an excellent way to stimulate an injured area and avoid excessive irritation. This neurological curiosity has been known for years, but it is apparently rarely used by health care professionals treating acute injuries. Cross education is a procedure that has been found to be particularly useful in the treatment of shoulder and ankle injuries, and also provides benefits in most other types of injuries.

When a muscle performs resistance exercise, a neurological stimulus crosses the spinal cord and is received in the corresponding muscle group on the other side of the body. The technical description of this phenomenon is "neural integration of interlimb coordination."² This concept can be used to help patients recover rapidly from an acute injury.

Cross Education and Your Patients

To use cross education in your practice, you must first identify the exercises your patient needs to perform for an injured area. Prior to starting, have the patient perform the desired exercises on the uninjured side. In a case involving a major acute injury (or postsurgery), the exercise of the opposite uninjured muscle group should continue for several days to numerous weeks, depending on the extent and severity of the damage. The cross education exercises should specifically be done any time an injury is immobilized (casted or pinned), or when the area directly injured is too painful to consider direct exercise.

As healing progresses, your patient should begin exercising the injured region. Even at this stage, however, the patient could begin and end each session by exercising the uninjured side. Cross education will permit early, aggressive exercising without directly irritating or further damaging the injured area. This, in turn, should lead to a more rapid recovery.

An Example of Cross Education

A common example of cross education exercise would involve an acute right shoulder injury that prevents a normal range of abduction. Immediately start the patient performing abduction exercises with the uninjured left arm. When the patient is ready to start limited exercising of the injured right shoulder, the patient should

first perform a similar pattern of left shoulder abduction against resistance.

Cross Educational Research

A 1997 study investigated the various parameters of cross education on human volunteers.³ Both quadriceps muscles of the subjects were tested for strength, and then progressive resistance exercising was performed with the left leg only. Twelve weeks into the study, significant strength gains were measured in the unexercised legs. Researchers found the most significant improvement and the greatest gains in strength in the group that used lengthening (eccentric) exercises.

Conclusion

Arrange for your acute injury patients to begin an exercise program immediately after injuries, have them avoid direct exercise of the injured areas initially. Recommend cross-educational exercises to supply the stimulus necessary to take advantage of the early exercise phenomenon, while avoiding the potential for re-injury of the damaged areas. Show each patient which exercises to do, but start the exercises on the opposite side of the body for the first several days.

To make more rapid progress, have the patients focus on the lengthening (eccentric) part of the exercise movement. As they progress, and injuries begin to heal, the symptomatic region can be safely exercised, but remember to exercise the uninjured side before and after the session in which the injured side is exercised. The injured side will "remember."

References

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