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Original article

Immediate effects of active cranio-cervical flexion exercise versus passive mobilisation of the upper cervical spine on pain and performance on the cranio-cervical flexion test

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ABSTRACT

This study compared the immediate effects of an assisted plus active cranio-cervical flexion exercise (exercise group) versus a passive mobilisation plus assisted cranio-cervical flexion (mobilisation group) on performance of the cranio-cervical flexion test (CCFT), cervical range of motion (ROM) and pain in patients with chronic neck pain. Eighteen volunteers with chronic idiopathic neck pain participated in the study and were randomised to one of the two intervention groups. Current level of pain, cervical ROM and pain perceived during movement, pressure pain threshold (PPT) and surface electromyography (EMG) during performance of the CCFT were measured before and immediately after the intervention. A significant reduction in resting pain and PPT measured over cervical sites was observed immediately following both interventions, although a greater change was observed for the exercise group. No change in cervical ROM was observed after either intervention. Reduced sternocleidomastoid and anterior scalene EMG amplitude were observed during stages of the CCFT but only for the participants in the active exercise group. Although both active and passive interventions offered pain relief, only the exercise group improved on a task of motor function highlighting the importance of specific active treatment for improved motor control of the cervical spine.

1. Introduction

Neck pain is a long-standing problem (Holmberg and Thelin, 2006; Kjellman et al., 2001) and costly for society (Korthals de Bos et al., 2003). Pain is only a single, non-recurrent event in 6.3% of patients experiencing neck pain (Picavet and Schouten, 2003). Between half and three quarters of people with current neck pain will experience recurrence within 1–5 years (Carroll et al., 2009). A contributing mechanical cause of recurrent neck pain can be disturbances in motor control of the cervical spine which may increase the risk of micro-/macrotrauma of cervical structures (Bogduk and McGuirk, 2006; Pearson et al., 2004). Restoration of muscle function is therefore considered fundamental for the treatment of cervical spine disorders (Jull et al., 2008).

Reduced activation of the deep cervical flexors muscles has been observed directly (Falla et al., 2004) and indirectly (Amiri et al., 2007; Chiu et al., 2005; Jull, 2000; Jull et al., 1999; Jull et al., 2004; Jull et al., 2007) when people with neck pain perform the cranio-cervical flexion test (CCFT). Reduced activation of the deep cervical flexor muscles during performance of this task is concomitant with increased activation of the superficial muscles (e.g. the sternocleidomastoid and anterior scalenes), indicating a reorganization of the motor strategy to perform the task (Falla et al., 2004). Used as an exercise, cranio-cervical flexion succeeds in both immediate (O'Leary et al., 2007) and long term pain relief (Jull et al., 2002; O'Leary et al., 2012) and leads to improved coordination between the deep and superficial cervical flexors (Jull et al., 2009).

Passive joint mobilisation might be a useful technique to promote improved neck muscle activation when painful or

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목의 통증,
운동으로
치료합시다.

Immediate effects of active cranio-cervical flexion exercise versus passive mobilisation of the upper cervical spine on pain and performance on the cranio-cervical flexion test

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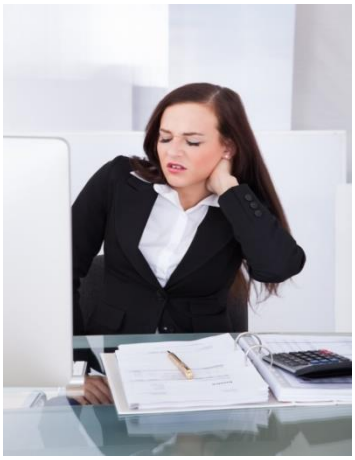

잘못된 자세와 습관으로 인한 목의 통증 때문에 병원을 찾는 사람들이 많아지고 있습니다. 많은 경우, 환자는 가만히 있는 동안 전기치료, 온열치료, 마사지, 관절가동술 등 **수동적인 치료**가 적용되고 있습니다.

하지만 이러한 치료들은 받을 때는 편하지만 증상이 다시 나타나게 되는 경우가 많습니다.

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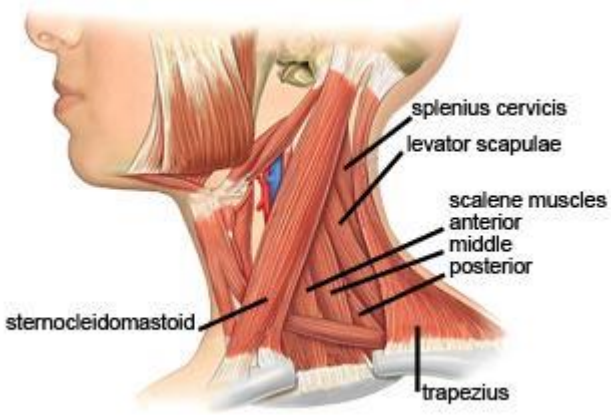
목이 아픈 사람들의 특징



많은 연구에 의하면 목에 통증이 있는 사람들은
CCFT(cranio-cervical flexion test)를 하는 동안
깊은 목굽힘근들의 작용이 감소하고 (긴목근, 긴머리근)
얕은 목굽힘근들의 작용이 증가한 (목빗근, 앞목갈비근)
움직임의 패턴을 보인다고 합니다.

또한 이러한 움직임의 패턴을 고치는 것이 목의 통증 치료에 있어서 **매우 중요하다고** 합니다.

수동적으로 받는 치료와 능동적인 운동을 통한 치료
그렇다면 이 중에서 어떤 것이 더 효과적일까요?

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실험방법

이 논문에서는 Active craniocervical flexion exercise와 Passive mobilization 의 효과를 비교하기 위하여 만성 목 통증을 가지고 있는 환자 18명을 Active와 Passive 두 그룹으로 나누어 각각의 중재를 적용하였습니다.

치료효과 비교를 위해 중재 전과 후에 통증정도를 NRS를 통해 측정하였고, Pressure-pain threshold는 Algometer로, ROM은 앉은 자세에서의 Active ROM을 측정, 근전도는 SCM, Anterior Scalene, Splenius Capitis에 부착하여 값을 측정한 후 비교하였습니다.

Active craniocervical flexion exercise (with therapist's guide)

Passive mobilization(sustained)

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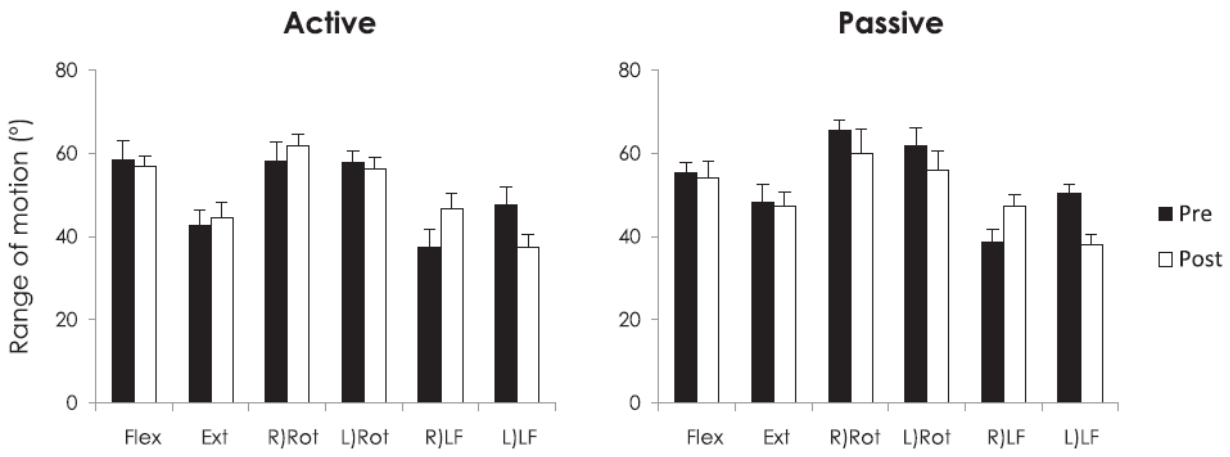
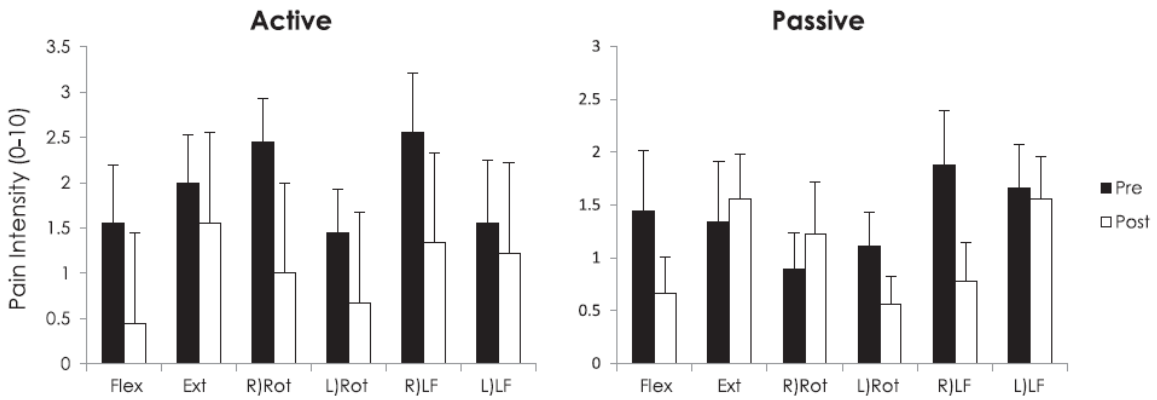
실험 결과 및 결론



ROM은 두 그룹 모두에서 큰 차이가 없었습니다.



하지만 움직일 때 느끼는 통증정도는
Active그룹은 모든 방향에서 감소한 반면
Passive 그룹은 특정 방향에서만 감소하였으며
통증의 감소 폭 역시 Active그룹에서 훨씬 컸습니다.

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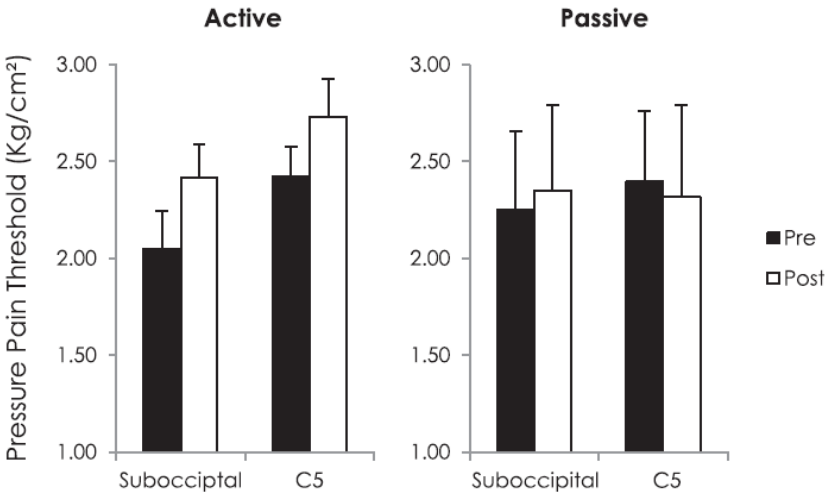
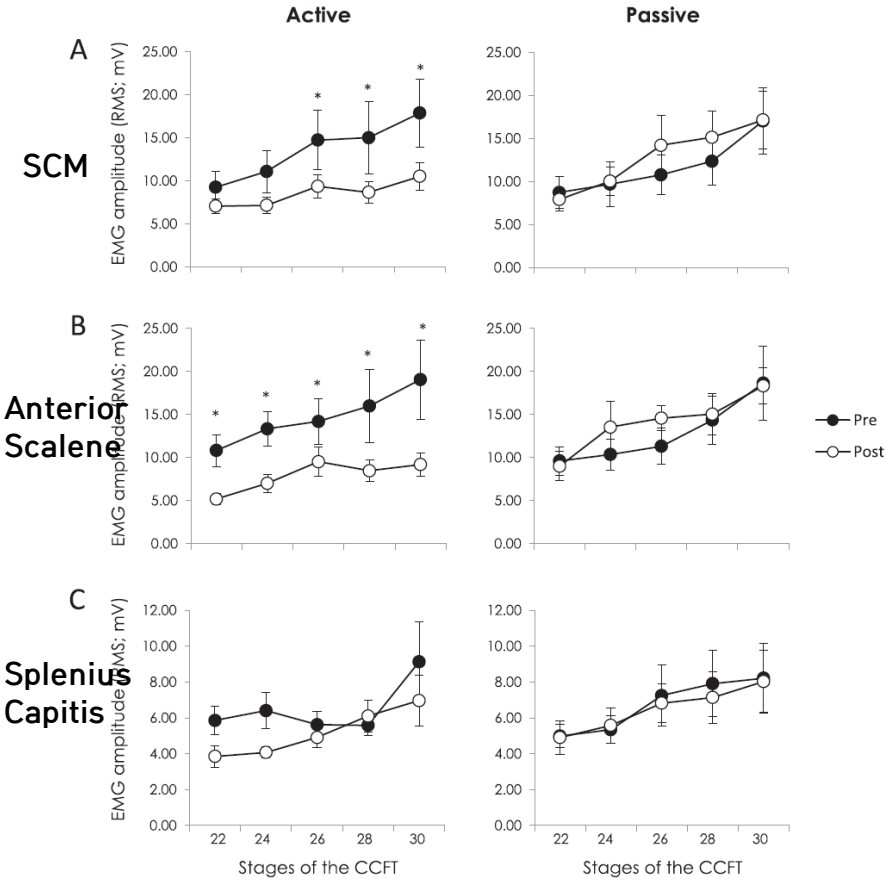
실험 결과 및 결론



Pressure-pain threshold 역시 Passive그룹에서는 적용 전과 후 유의한 차이가 없었지만 Active그룹은 큰 차이를 보였습니다.



Active그룹에서만 SCM과 Anterior Scalene의 근전도가 감소하였습니다.

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실험 결과 및 결론

저자는 능동적인 운동 중에 발생하는 mechanical sensory input이 통증완화에 중요한 역할을 하고 운동신경의 활성도를 변화시켜 운동기능향상에 영향을 준다고 설명하고 있습니다.

따라서 Active exercise와 Passive mobilization을 비교했을 때 Active exercise가 mechanical sensory input으로 인해 통증완화에 더 효과적이며 운동조절 향상에도 더 효과적이라고 생각할 수 있습니다.

따라서 "목의 통증에 Active exercise와

Passive mobilization 중 효과적인 것은?"에 대한 근골격계 전문가인

우리의 답변은

"능동적인 운동과 수동적 관절가동술 모두 목의 통증완화에

도움이 되지만 통증완화의 정도와, 운동조절 향상을 고려 했을 때

능동적인 운동이 더 효과적이다."

라고 이 논문을 근거로 이야기 할 수 있을 것이다.

-KEMA 책임 연구원 곽경태-

-문의사항은 KEMA 홈페이지 Q&A 란에 남겨주세요-

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