A 31 year old physiotherapist presented to my practice complaining of a 12 years long history of thoracic spine problem.

Her main problem was the band-like thoracic pain (1) that sometimes irradiated along the inferior ribs (2). This pain worsened in prolonged flexion, in supine, lifting weights, in the morning and in the evening.

The patient trained in a gym doing running and crossfit, but both activities exacerbated her symptoms, in particular overhead exercises and push ups. Occasionally she complained also of cervical spine pain (3) and right buttock pain (4), but these didn't seem to have a direct relationship with her main problem.

The history of this problem was very long, she started suffering from thoracic pain when she was 19, without a particular cause, and since then she has experienced many episodes of thoracic "blocks" that have worsened when she started working as a physio 9 years ago.

She treats mainly neurological patients that require frequent significant physical efforts particular during the moving from wheelchair to the plinth and vice versa and this activities worsened her pain to a point that it precluded her from sleep in the acute phases.

She has smoked since she was 14.

She used regularly painkillers and occasionally has been treated by colleagues with manual therapy with temporary relief.

An MRI showed three herniated discs from T5 to T8.

This patient presented a clinical picture compatible with a thoracic discogenic pain
The band-like pain irradiating along the intercostal spaces has been described as a typical clinical feature of thoracic intervertebral disc pain (Schellas et al. 1994). The worsening in sustained flexion and extension activities reinforced the discogenic pain hypothesis. Also morning is a typical feature of a discogenic clinical picture; evening pain suggested also that load bearing ability was reduced. The MRI findings however couldn't add any confirmation or disconfirmation to the hypothesis because the incidence of asymptomatic thoracic disc protrusions may be as high as 37% but symptomatic ones are estimated in one per million population (Kirkham et al. 1997).

Central pain mechanisms could have been at work in this case too, because of the long lasting symptoms, together with some motor control/load transfer altered mechanisms.

Physical examination

On the first assessment, spontaneous thoracic pain VAS was 7/10 in standing. On physical examination she exhibited a marked kiphotic-lordotic posture, reduced infrasternal angle with increased tone of upper abdominals and thoraco-lumbar paravertebral muscles and lower tone of lower abdominals. Thoracic spine active movements of extension and rotations were markedly reduced and painful, flexion was normal and decreased the symptoms. Sensitivity was reduced on the 8\textsuperscript{th} intercostal spaces. Neurodynamic slump test was negative. Postero-anterior accessory examination of thoracic area revealed stiffness and pain at all levels between T4 and T10.

Breathing releasing exercises and thoracic mobilization

The releasing of upper abdominal muscles obtained through diaphragmatic respiration and selective expansion of lower ribs determined an immediate decrease of symptoms, from 7/10 to 3/10 in standing and a restoration of sensitivity at 8\textsuperscript{th} intercostal spaces. After this releasing exercises, direct manual mobilization of thoracic area were less painful and allowed a further reduction of symptoms, together with an improvement of mobility.

Screenings of other areas:

- lumbar spine: reduced lumbar flexion, increased tone in lumbar paravertebral muscle
- pelvic girdle postero-anterior accessory movement of right sacroiliac joint revealed local stiffness and local pain (4).
- Cervical spine: restricted extension and left rotation, together with local painful (3) left unilateral postero-anterior accessory movements at C4 and C7 levels.

Manual mobilization of thoracic area, left sacroiliac joint and C4 and C7 was performed with improvement of the main patient's symptom.

Motor control and exercises management

Motor control issues were considered too, introducing exercises to increase thoracic extension in association with respiratory releasing exercises and active shoulder flexion. The control of anterior pelvic tilt was introduced, without over-activating upper abdominals.
muscles and together with releasing of tight lumbar paravertebral muscles and ileotibial band bilaterally.

After 8 sessions a brief but intense routine of exercises focusing on thoracic extension, strengthening of gluteals and lower abdominal muscles has been proposed to the patient, encouraging her to continue her training.

In the end, the patient was totally pain free and could sustain a heavy workday and an intense training without symptoms.

Conclusion

Chronic non specific low back pain patients often represent maladaptive postural patterns with the potential to provoke strain and pain.

Just as my patient, “active extension patients”, according to the O'Sullivan's classification demonstrate hyperlordosis, show hyperactivity of superficial back and abdominals muscles (Dankaerts et al. 2006).

It seems that increasing activation of superficial trunk muscles lead to restrict trunk movements as a stiffening strategy and avoid potentially injurious losses of balance in LBP patients (Ehsani et al. 2016).

However an excessive abdominal and back muscles tone could lead to increased compression of spinal structures and altered breathing pattern.

Increased activity of abdominals muscles can reduce the horizontal lower ribs movement altering the right diaphragmatic breathing pattern.

This restriction leads to upper “chest breathing”, and is correlated to neck pain and musculoskeletal pain in general (Perri et al. 2004).

In conclusion, this patient was “too stable” due to excessive co-contraction of her muscles, but this strategy didn't reduce her pain, it reduced her mobility, altered her breathing pattern and compromised her body's capacity to sustain and to transfer loads optimally alimenting her symptoms in a vicious circle.

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