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The role of collar in chronic neck pain

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I. Background

The International Association for the Study of Pain (IASP) classify the cervical spinal pain as "pain perceived anywhere in the posterior region of the cervical spine, from the superior nuchal line to the first thoracic spinous process" (1).

Neck pain is a common musculoskeletal condition with a point prevalence ranging from 21% to 22%(2).Chronic mean last for 12 weeks or more duration and Up to 50% of people with neck pain are categorised as "chronic" with pain and subsequent disability lasting more than three months (3).

Neck pain may cause a considerable personal and socioeconomic burden—which is one of the top five chronic pain conditions in terms of prevalence and years lost to disability(4).

Neck pain is second only to low back pain as the most common musculoskeletal disorder in population surveys and primary care, and, like low back pain, it poses a significant health and economic burden, and being a frequent source of disability.(5)

About two thirds of the population get neck pain at some time in their lives, and prevalence is highest in middle age.(6).

Most patients who present with neck pain have "non-specific (simple) neck pain," where symptoms have a postural or mechanical basis(6).

Although most acute episodes resolve spontaneously, more than a third of affected people still have low grade symptoms or recurrences more than one year later, with genetics and psychosocial factors being risk factors for persistence.(3).

Cervical spine:

The head-neck system consists of seven cervical vertebrae and has a unique anatomy and motion to accommodate the needs of a highly mobile head-torso transitory zone, it is the most mobile region of the spine(5).

Spine is a multiarticular system formed by column, muscles and tendons and central nervous system. It supports the head and trunk during posture and movements and at the same time it protects the spinal cord and the nerve roots.

The column includes bones, discs, ligaments and joint capsules; these structures fulfill an intrinsic structural role and contain mechanoreceptors which act as transducers, sending a continuous flow of proprioceptive information on loads, motions and posture to the central nervous system that, in turn, replies via an appropriate and coordinated feedback muscular

Actions.(7).

Cervical lordosis in the neutral position develops with aging, while extension ROM decreases gradually(8).

Biomechanics:

The cervical spine is much more mobile than the thoracic or lumbar regions of the spine, Spine stability is the basic requirement to protect nervous structures and prevent the early mechanical deterioration of spinal components. .(9).

Instability is classically considered as a global increase in the movements associated with the occurrence of back and/or nerve root pain. The assessment of spinal instability remains a major challenge for diagnostic imaging experts.

Bioengineers and surgeons are currently focusing on mobile stabilization systems. These systems represent a new frontier in the treatment of painful degenerative spine and aim to neutralize noxious forces, restore the normal function of spinal segments and protect the adjacent segments(10).

Also age-related changes can modified cervical anatomy and reducing range of motion(11).

Causes of chronic neck pain:

A systematic review reports that arm force, arm posture, duration of sitting, work place design, repetitive hand and finger movements and monotonous work task cause neck and shoulder disorders.(12).

1-Most patients who present with neck pain have "non-specific (simple) neck pain," where symptoms have a postural or mechanical basis(6).

Other non-specific neck pain lesions are acute neck strain, postural neck ache, or whiplash,Fibromyalgia and psychogenic neck pain .

2- Mechanical lesions—disc prolapse or diffuse idiopathic skeletal hyperostosis.

3- Inflammatory disease—rheumatoid arthritis, ankylosing spondylitis, or polymyalgia rheumatic(6).

4- Metabolic diseases—Paget's disease, osteoporosis, gout, or pseudo-gout.

5- Infections—osteomyelitis or tuberculosis.

6- Malignancy—primary tumors, secondary deposits, or myeloma(6).

Symptoms:

Subjects with cervical pain often complaints with deep aching and unpleasant feelings in lower part of neck & upper part of the back. Popping joint sounds, head ache, muscle spasm, shortening of sternocleidomastoid muscle are also common. Unilateral or bilateral cervical pain ,dizziness, head ache, tingling like feelings, burning sensations, spasm , stiffness, shoulders pain, numbness, weakness & pain in the arm are common symptoms. Less common symptoms are unexplained weight loss, head ache, fever, nausea, night sweats, blurred vision, and difficulty in writing, swallowing, talking & walking.

Cervical pain can be caused by injury. A severe injury in the cervical area may become serious or life threatening & require medical treatment if it present with other symptoms like;

• Tingling sensation
• Weakness
• Numbness(13)

Natural history of neck pain:

The outcome of neck pain depends on the underlying cause, but acute neck pain usually resolves within days or weeks, although it can recur or become chronic (more than three months' duration) Outcome is unpredictable once pain becomes chronic, and prognosis and the factors that influence it vary greatly like age, sex, occupation, psychological factors,(6).

Management:

Conservative management for neck pain may include many strategies such as advice, education, manual therapy and exercise (14), although the etiology of neck pain is usually known, it is often difficult to predict which patients will respond to conservative care and which patients will have persistent pain, despite several interventions. Most musculoskeletal conditions resulting in neck pain respond quickly to conservative treatment and heal without squeal(15)

Most mechanical neck pain will respond to conservative measures, but the optimal treatment for uncomplicated neck pain has yet to be established.

Muscle relaxants and non-steroidal anti-inflammatory drugs are effective for acute neck pain, and clinical practice is mostly guided by the results of studies performed for other chronic pain conditions. Among complementary and alternative treatments, the strongest evidence is for exercise, with weaker evidence supporting massage, acupuncture, yoga, and spinal manipulation in different contexts. For cervical radiculopathy and facet arthropathy, weak evidence supports epidural steroid injections and radiofrequency denervation, respectively. Surgery is more effective than conservative treatment in the short term but not in the long term for most of these patients, and clinical observation is a reasonable strategy before surgery.(4).

Following are the physiotherapy treatment options for cervical pain

• Massage
• Mobilization
• Manipulation
• Traction
• Heating pads (moist or dry)
• Ice pack
• Hydrotherapy
• Spray and spray and stretch
• Exercise therapy
• Range of motion therapy (ROM)
• Aerobic ex. Programs
• Postural correction

• Bio-feedback and relaxation
• Strengthening programs
• Educational intervention
Electrotherapy treatment
• Therapeutic ultrasound
• Thermal modalities
• Diathermy
• Infra-red light
• Electric treatment
• Galvanic stimulation
• Interferential current (16).

Cervical collar

Although, cervical collars are a seemingly benign intervention, they can have adverse effects, especially when used for longer periods of time. It is feared that a long period of immobilization, can result in atrophy-related secondary damage. Atrophy-related secondary damage after immobilization in closed plaster casts has been described in muscle, bone, capsular, and tendinous tissue. Animal experiments have shown that structural changes can be detected in healthy muscle tissue after an immobilization period of only 1 week(17).

A transfer of this knowledge to soft cervical collars is difficult, because a soft collar allows a substantial degree of movement. Also, it is doubtful whether muscular changes can be attributed to wearing a cervical collar alone or whether they may be explained by physiologic mechanisms of pain avoidance (18).
Although the collar may be of symptomatic benefit, there is no evidence on long-term outcome (19).

II. Patients and Methods

This is a prospective, randomized controlled study for group of patients with nonspecific neck pain for more than 12 weeks treated with medication and cervical collar and second group with the same course of the neck pain in a control group that did not use cervical collar other than the same medication of the first group.

From January 2017 to January 2018 we managed 204 patients were attended to outpatient clinic of al shatra general hospital and privet clinics were they complain of neck pain and fellow up them for more than one year .

All patients were selected with same clinical course of nonspecific chronic neck pain from sign and symptoms and we put them in same criteria of the age , sex , sedentary life style and we excluded all neck pain secondary to underlying pathologies.
We selected the patients with same criteria:
Age: We select all patients with same range between 30 -60 years.
Sex : the two groups female to male ratio3/1.
Duration: more than 12 weeks of clinical coarse for all patients.
Work and activity : all were not heavy manual worker.
Risk factors: we exclude all other causes of chronic neck pain.
Medical treatments: we used same regime of medical treatment for all patients.
We gave the patients same medical treatment of rest, non-steroidal anti-inflammatory drugs from the same family groups and from same factory origin , muscle relaxants and ice gel.
we examine all patients in one week interval and asses the responds of the medical treatment, we depend on subjectively assessment of the patients and their satisfaction on their signs and symptoms with no additional radiological and investigations parameters apart from that of the first visit.
102 patients were use cervical collar first week day and night and second week only at night with the medical treatment coarse, The patients in the soft cervical collar group were instructed to wear the collar as much as they could tolerate for the first 2 weeks.
The second 102 patients treated with same medical regime without cervical collar.

Group	No.of patients	age	sex
Collar	102	35-55 years	3/1 female/male ratio
control	102	35-60 years	3/1 female/male ratio

Both the groups were advised to rest and given analgesics at the discretion of the treating physician.
All patients 204 had no history of physiotherapy in the previous coarse of treatment.
At 6 months follow-up there was no difference in the groups in terms of pain, complete recovery, or improvement. They concluded that soft cervical collars do not influence the duration or degree of persistent pain.

Additionally, a physical rehabilitation program of 3 months duration was given to all patients, including instruction on body mechanics, and proper cervical spine mechanics.
Data analyzed included symptom level, activity and function level, medication and ongoing medical care, job status, and satisfaction.

III. Conclusion

The use of cervical collars to treat chronic neck pain is an area of controversy.
The available research in this area in general, finds limited roles for collars. Mechanism of injury, clinical symptoms, and response to bracing may vary based on diagnosis and etiology of neck pain and the psychological status of the patients
This review will examine the available evidence for recommending cervical collars based on the chronic non specific neck pain.
Therefore, there does not seem to be any significant benefit to extending the duration of collar usage.

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