

Is There a Connection Between Non Responsive Neck or Back Pain Patients and Altered Respiratory Chemistry: a Case Series

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Purpose

To determine whether respiratory chemistry was altered in a series of patients with neck or back pain and secondly whether breathing retraining could improve chemistry, pain and function.

Relevance

Both neck pain and back pain are extremely common with a lifetime prevalence of 70% - 80%. Current Meta Analyses suggest back and neck pain management could be improved. Epidemiological evidence supports a link between breathing difficulties and back pain. Since trunk muscles perform both postural and breathing functions, it is theorized that disruption in one function can negatively impact the other. The addition of breathing management to traditional manual therapy may lead to improved patient outcomes.

Methods

Twenty nine patients with neck or back pain who had plateaued with manual therapy and exercise were identified in an outpatient physiotherapy setting. Patients' age varied from 14 to 74 years (mean 42.0, SD 13.7). Symptom duration varied between 1 and 156 months (mean of 38, median 24).

Pain was measured by Numeric Pain Rating Scale and function by the Patient Specific Functional Scale. Respiratory function was determined by capnography which measures end tidal carbon dioxide levels (ETCO₂). Capnography, a reliable, time sensitive method of estimating arterial CO₂ levels is used routinely in critical care settings. Arterial CO₂ levels below 35 mm Hg indicate an increase in pH of blood, cerebrospinal and extracellular fluid leading to decreased tissue oxygenation. Respiratory chemistry, pain and function were measured before and after breathing retraining.

Analysis

Descriptive statistics were calculated including: min, max, mean, standard deviation, frequencies and percentages. Inferential statistics included: paired t test and matched chi square analysis. The level of significance was 0.05.

Results

Results showed that all subjects had ETCO₂ readings below 35 mmHg which all were able to improve with breathing retraining (P < 0.001). All patients improved in both pain (P < 0.001) and function (P < 0.001) with 93% achieving a clinically important change.

Conclusions

This study provides preliminary evidence that improving respiratory function decreases pain and increases function. The inclusion of breathing management in the clinicians' reasoning repertoire may improve patient outcomes. Further prospective studies are necessary to validate these results.