

Pain relief of chest wall pain by electrical twitch obtaining intramuscular stimulation

Dae Geun Jeon^{1*}, Wang Hyeon Yun¹, Do Young Kim¹, Jinyoung Park^{1†}, Soojin Choi³, Jae Eun Park²

Department of Rehabilitation Medicine, Gangnam Severance, Rehabilitation Institute of Neuromuscular Disease, Yonsei University College of Medicine, Seoul, Korea¹, Department of Rehabilitation, Severance Hospital, Yonsei University College of Medicine, Seoul, Korea², National Health Insurance Service Ilsan Hospital, Department and Research Institute of Rehabilitation Medicine³

INTRODUCTION

Muscle related chest wall pain (CWP) is generally develop under the condition of excessive or sudden activity of untrained muscles. Although pain originating from muscle strain subsides in most cases with conservative management, sometimes pain lasts longer than several days and became intractable. Anatomic characteristic of intercostal muscles which are limited of motion by the skeleton of the thorax, it is difficult to apply physical therapy. In the following three cases, we report the effective pain relief by electrical twitch obtaining intramuscular stimulation (ETOIMS) in patients who experienced no improvement after conventional management of CWP.

CASE REPORT

We report three patients who had chronic chest wall pain originating from intercostal muscle strain despite receiving diverse treatments from other medical departments, and finally visited our pain clinic in a tertiary hospital. ETOIMS was applied to all three patients by monopolar needle into several tender points of each intercostal muscle. Case 1. A 60-year-old man suffered from the 3-months of traumatic chest wall pain which acutely developed during volleyball play. The ETOIMS was performed to right posterior intercostal muscle which showed tenderness between 9th and 10th ribs. The initial NRS or resting chest wall pain was 5, and immediately after ETOIMS, NRS was substantially reduced to 2. Case 2. A 58-year-old woman complaining the 21-months of right anterior chest wall pain after sudden back extension has visited the department of pulmonology and thoracic surgery. ETOIMS was applied to right anterior intercostal muscle presenting tenderness between 6th and 7th ribs. At initial visit, her NRS was recorded as 6 which improved to 3 immediately after ETOIMS. On follow-up after 1 week, NRS was 5. Case 3. A 30-year-old woman who did not have a trauma history noticed shooting chest wall pain. ETOIMS was performed to the right anterior intercostal muscle which showed tenderness between 2nd and 3rd ribs. Her pain score at initial visit was 8 and then subsided to 2 immediately after ETOIMS. On follow-up after 1 week NRS was 1.

DISCUSSION

Even though the mechanisms of ETOIMS have not been completely revealed yet, experimental evidence implies that electrical twitch induces deep muscle contraction.

After muscle contraction, immediate relaxation of tight and shortened muscle may reduce pain by stretching effect. Contraction induced non-painful input makes pain relief by closing a pain gate of nociceptive fiber. Increase in blood perfusion of ischemic muscle following contraction is alsodescribed as a mechanism that causes a pain reduction. In these cases, ETOIMS showed substantial reduction of NRS in the patients with chronic muscular CWP. Our reports indicate that ETOIMS can be a therapeutic option for patients who failed prior conservative management for muscular CWP.