The Purport of Steroid Treatment in the Weakness Phase of Parsonage-Turner Syndrome

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This article presents six cases of Parsonage-Turner syndrome with corticosteroid therapy in the muscle weakness phase. Three cases did not receive injected steroids after the onset of muscle weakness, and were classified as Group 1. The other three cases received injected steroid from just after muscle weakness onset, and were classified as Group 2. This article has a small study group of six cases, but is the first case study about the efficacy of steroids in the muscle weakness phase, showing a better treatment result when steroids were injected during the muscle weakness period. We report these findings, together with a review of the literature.

Key words: Parsonage-Turner syndrome, corticosteroid
observed after 8 months (MRC grade 4), and patients were able to work normally after 12 months (grade 5) (Table 3). Summarized data for Group 1 are in Table 1.

Group 2 had three cases with a mean age of 47 years old, ranging from 39 to 51. Patients were engaged in an occupation that used the arms frequently, and none had a specific trauma or disease history. Two patients had visited other medical institutions with a chief complaint of burning pain of the upper extremity and pharmacological treatment was given for pain control although this gave no pain relief. The patients visited our hospital within 14 days of pain onset. In one case, the patient visited our hospital just after pain onset because of pain in the left upper extremity and shoulder. At the time of the visit, no sign of motor or sensory weakness of the affected upper extremities was observed. On physical examination at admission, the range of motion of the upper limbs was normal, and tenderness and tinel sign were positive at the supravclavicular brachial plexus, but muscle atrophy was not found. Muscle power, sensation, and tendon reflex were all normal. A spurling test of the neck was negative, and various tests for shoulder lesions such as rotator cuff tear were all negative. Simple X-ray of the neck and shoulder joint showed no abnormal findings. After 5 weeks from onset, pain was relieved but weakness of muscle power at left upper limb appeared, with grade 3 for elbow flexion. EMG performed at that time found a lesion at the area of the left brachial plexus. Based on the clinical course and EMG findings, the patient was diagnosed with PTS. A dose regimen of steroids followed, with a two week course of oral prednisolone, 60 mg daily in the first week, and tapering to the dosage by 10 mg per day with a 5 mg as the last step. Oral prednisolone was accompanied with physical therapy within 7 days of the onset of muscle weakness (one case just after onset, two cases within 5 days of onset). No side effects of steroid treatment were observed. Recovery parameters were as for Group 1. After 8 months, muscle

| Case number | Age/sex | Preceding Hx. | 1st clinical feature (VAS)/time to pain relief | F/U (mo) | MRI finding | EMG finding | Involved muscle/MRC grade | Treatment (except steroid) | Steroid treatment | Recovery time of muscle strength (mo)* | Complications |
|-------------|---------|--------------|-----------------------------------------------|---------|-------------|-------------|---------------------------|----------------------------|-----------------|--------------------------------------|--------------|
| 1           | 36/M    | Fever        | Painful right arm (8)/35 days                  | 49      | –           | BP          | DM, BB, IS, SS/grade 3    | NSAIDs+PT                 | (–)             | 11                                     | (–)           |
| 2           | 47/F    | Trauma       | Painful right arm (10)/22 days                 | 63      | –           | BP          | SS, IS, BB, B/grade 3     | NSAIDs+PT                 | (–)             | 12                                     | Mild weakness |
| 3           | 61/F    | Unknown      | Painful right shoulder (8)/27 days             | 19      | –           | CP          | Serratus, trapezius/grade 3 | NSAIDs+PT                 | (–)             | 12                                     | (–)           |

*Time for recovery of 80% strength during working, in comparing with normal side. Hx., history; VAS, visual analogue scale; F/U, follow-up; MRI, magnetic resonance imaging; EMG, electromyogram; MRC, Medical Research Council; M, male; F, female; BP, brachial plexus; CP, cervical plexus; DM, deltoid muscle; BB, biceps brachis; IS, infraspinatus; SS, supraspinatus; B, brachialis; NSAID, non-steroidal anti-inflammatory drug; PT, physical therapy.

| Case number | Age/sex | Preceding Hx. | 1st clinical feature (VAS)/time to pain relief | F/U (mo) | MRI finding | EMG finding | Involved muscle/MRC grade | Treatment (except steroid) | Steroid treatment | Recovery time of muscle strength (mo)* | Complications |
|-------------|---------|--------------|-----------------------------------------------|---------|-------------|-------------|---------------------------|----------------------------|-----------------|--------------------------------------|--------------|
| 4           | 39/F    | Unknown      | Painful right arm (8)/23 days                  | 49      | –           | BP          | IS, SS/grade 3            | NSAIDs+PT                 | (+)             | 6                                      | (–)           |
| 5           | 50/F    | Infection    | Painful left arm (8)/21 days                   | 63      | N.C.        | BP          | SS, IS, BB, B/grade 3     | NSAIDs+PT                 | (+)             | 8                                      | (–)           |
| 6           | 51/M    | Unknown      | Painful Bilat. arm (9)/38 days                 | 19      | –           | CP          | Serratus, trapezius/grade 3 | NSAIDs+PT                 | (+)             | 8                                      | (–)           |

*Time for recovery of 80% strength during working, in comparing with normal side. Hx., history; VAS, visual analogue scale; F/U, follow-up; MRI, magnetic resonance imaging; EMG, electromyogram; MRC, Medical Research Council; F, female; M, male; Bilat, bilateral; N.C., not checked; BP, brachial plexus; CP, cervical plexus; IS, infraspinatus; SS, supraspinatus; BB, biceps brachis; B, brachialis; NSAID, non-steroidal anti-inflammatory drug; PT, physical therapy.
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strength was restored (MRC grade 5) and the patient was able to return to his work (Table 3). The summarized data of Group 2 is described in Table 2.

**DISCUSSION**

PTS was first reported by Freinberg in 1897, but the disease name was not established until Personage and Turner described a series of 136 clinical cases in 1948. Other terms used to describe this disease entity include neuralgic amyotrophy, brachial plexus neuritis, idiopathic brachial plexopathy, acute brachial radiculitis. However, the general term Parsonage–Turner syndrome is most commonly used. The etiology of this condition remains unclear, but an immune attack on the brachial plexus or its branches within the limb triggered by various preceding events, such as infection, vaccination, pregnancy and parturition, surgery, radiation, intravenous heroin use, or treatment with interferon, has been suggested as a cause, although pathological evidence is scant. Trauma is not a certain risk factor, but is recognized as a contributing factor after Mulvey et al reported that mild trauma could induce symptoms of neuritis. One case in group 1 was associated with trauma, and the others were related to mild infection. Symptoms of PTS vary widely, but the typical clinical course starts with acute, severe, aching, unilateral shoulder and proximal arm pain lasting from days to a few weeks. When the pain abates, painless shoulder girdle and arm weakness develops, more prominent in the upper plexus muscles including deltoid, supra or infraspinatus, biceps. Forearm and hand muscles are less frequently involved.

Non-randomized studies provide some evidence to support shortening the time of intense pain and hastening motor nerve recovery when the corticosteroids are administered during the acute phase of the condition. Anecdotal evidence suggests that their use leads to a more rapid resolution of the painful phase of the illness, in particular when used early in its course, although they do not seem to influence the ultimate prognosis. Non-controlled clinical observations

| Case number | F/U duration | Full recovery (normal side: 100%) | Able to work | Modified Rankin score (%) |
|-------------|--------------|-----------------------------------|-------------|---------------------------|
| 1           | 6 mo         | 30%                               | (-)         |                           |
| 1           | 1 yr         | 60%                               | (-)         |                           |
| 2           | 2 yr         | 90%                               | (+)         |                           |
| 2           | 6 mo         | 20%                               | (-)         |                           |
| 2           | 1 yr         | 50%                               | (-)         |                           |
| 2           | 2 yr         | 60%                               | (-)         |                           |
| 3           | 6 mo         | 30%                               | (-)         |                           |
| 3           | 1 yr         | 70%                               | (-)         |                           |
| 3           | 2 yr         | Nearly 100%                        | (+)         |                           |
| 4           | 6 mo         | 50%                               | (-)         |                           |
| 4           | 1 yr         | 80%                               | (+)         |                           |
| 4           | 2 yr         | Nearly 100%                        | (+)         |                           |
| 5           | 6 mo         | 60%                               | (?)         |                           |
| 5           | 1 yr         | 80%                               | (+)         |                           |
| 5           | 2 yr         | 90%                               | (+)         |                           |
| 6           | 6 mo         | 50%                               | (-)         |                           |
| 6           | 1 yr         | 70%                               | (+)         |                           |
| 6           | 2 yr         | 90%                               | (+)         |                           |

*Patient said that “I can work”, although muscle power was 60% of normal side. F/U, follow-up.
suggest that very early treatment with corticosteroids in some cases results in prompt pain resolution, with no or minimal weakness.\(^9\) In this study, patients of group 1 returned to work after 6 months from the onset of pain, and worked normally after 12 months. However, in group 2, muscle strength was restored after 8 months from the onset of the pain, with return to normal work within 12 months (p=0.001) (Table 3). However, statistical comparisons of steroid-treated patients with the untreated group showed no differences in baseline variables such as age, sex, preceding history and the occurrence of atrophy, or weakness symptoms during the attack.

No study has reported on the efficacy of steroid treatment in the muscle weakness phase. Although this report lacks a large number of cases and a follow-up period, it is meaningful as the first study on the efficacy of steroid injection in the muscle weakness phase of PTS. We propose that even in this phase, steroid injection is possible to improve recovery time and enable rapid return to daily life.

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파르소니자-터너 증후군에서 근력 약화시기에
스테로이드 투여의 의미

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파르소니자-터너 증후군(Parsonage-Turner syndrome)은 견갑부 및 상완의 동통 및 근력 약화를 야기하는 매우 드문 질환으로, 예후는 대부분 양호한 것으로 알려져 있으나 약 5-10%에서 영구적인 근력 약화를 야기할 수 있다. 근력 약화가 발생되기 전에 스테로이드를 투여하는 것이 도움이 된다고 보고되고 있으나, 근력 약화 이후에 스테로이드 투여의 효용성에 대한 문헌은 아직 보고된 적이 없었다. 저자들은 6예의 적은 증례수이기로 하여, 근력 약화가 발생한 후 스테로이드를 투여하여 만족스러운 치료 결과를 얻어, 문헌 고찰과 함께 보고하고자 한다.

색인단어: 파르소니자-터너 증후군, 스테로이드

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