Successful treatment with clarithromycin for patients with polymyalgia rheumatica

Masashi Ohe¹ and Toshiyuki Bohgaki²

¹Department of General Medicine, Hokkaido Social Insurance Hospital, Sapporo; ²Department of Medicine II, Hokkaido University Graduate School of Medicine, Sapporo, Japan

To the Editor,
Macrolide antibiotics (Macs) such as erythromycin and clarithromycin (CAM) have anti-inflammatory effects in addition to antibacterial activity. Using these anti-inflammatory effects, Macs have successful treated pathologies such as diffuse panbronchiolitis and sinusitis. Similarly, several recent studies have described the successful treatment of rheumatoid arthritis (RA) using CAM [1]. Polymyalgia rheumatica (PMR) is an inflammatory disease in which elevated proinflammatory cytokines such as tumor necrosis factor (TNF)-α and interleukin (IL)-6 are associated with clinical features, as is often the case with RA. Here, we report three cases of PMR treated successfully using CAM based on its anti-inflammatory effects suppressing TNF-α and IL-6 (Table 1) [2].

A 73-year-old woman was referred with subacute onset of severe pain in her neck, shoulders, arms, lower back, hip girdle, and thighs. Muscle tenderness was observed in these areas. However, neither swelling nor deformity of the joints was found. Laboratory findings were as follows: white blood cell count 6,140/µL, C-reactive protein (CRP) 7.17 mg/dL, erythrocyte sedimentation rate 58 mm/hr, rheumatoid factor 8 IU/mL (normal range, < 15), anticyclic citrullinated peptide antibody testing 2.5 U/mL (normal range, < 4.5), and antinuclear antibody titer x 40. Negative results were obtained for myeloperoxidase and proteinase-3 antineutrophil cytoplasmic antibodies. Ultimately, the patient was diagnosed with PMR. As she had uncontrolled diabetes mellitus, she was treated using CAM (400 mg/day) as an alternative to glucocorticoid (GC) after obtaining informed consent to start prednisolone (PSL) treatment immediately after any further exacerbation of PMR or after achieving control of diabetes mellitus. Two weeks later, her symptoms had improved and the CRP had decreased from 7.17 to 0.2 mg/dL. After a further exacerbation, the CAM was restarted at 400 mg/day. Two weeks after resuming treatment, the symptoms had again improved and the CRP had decreased to 0.34 mg/dL.

A 78-year-old woman with a 2-year history of PMR, which had been controlled by PSL (5 mg/day), presented with pain in the shoulders, hip girdle, and thighs and the CRP level had increased from 0.2 to 3.77 mg/dL. The symptoms had appeared after reducing the PSL dosage from 5 to 4 mg/day over 2 months. Two weeks after further exacerbation of PMR, the patient was treated with CAM (400 mg/day). Two weeks after resuming treatment, the symptoms had again improved and the CRP had decreased to 0.34 mg/dL.

A 78-year-old woman with a 2-year history of PMR, which had been controlled by PSL (5 mg/day), presented with pain in the shoulders, hip girdle, and thighs and the CRP level had increased from 0.2 to 3.77 mg/dL. The symptoms had appeared after reducing the PSL dosage from 5 to 4 mg/day over 2 months. To avoid an exacerbation of PMR, the patient was treated with CAM (400 mg/day). Two weeks after resuming treatment, the symptoms had again improved and the CRP had decreased to 0.34 mg/dL.

Copyright © 2014 The Korean Association of Internal Medicine
This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (http://creativecommons.org/licenses/by-nc/3.0/) which permits unrestricted noncommercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

pISSN 1226-3303
eISSN 2005-6648
http://www.kjim.org
A diagnosis of exacerbation of PMR was made. She was treated with CAM (400 mg/day) in combination with PSL (4 mg/day), after obtaining informed consent to start an increased dosage of PSL immediately after any further exacerbation of the PMR. Four weeks after starting the CAM, her symptoms had improved, with the CRP decreasing to 0.33 mg/dL.

A 77-year-old man with a 2-month history of PMR, which had been controlled by PSL (12.5 mg/day), presented with stiffness in the shoulders and lower back and an increase in CRP from 0.2 to 0.99 mg/dL after reducing the PSL dosage from 12.5 to 10 mg/day over 2 weeks. As an alternative to reincreasing the dosage of PSL, CAM (400 mg/day) was added because of its anti-inflammatory effects after obtaining informed consent to start an increased dosage of PSL immediately after any further exacerbation of the PMR. Two weeks later, his symptoms had improved with the CRP decreasing to 0.2 mg/dL.

The etiology and pathophysiology of PMR remain unclear. However, PMR is sometimes associated with neoplastic, other rheumatic, or infectious diseases. Some cases of PMR have been reported with or without seronegative symmetrical synovitis with pitting edema after *Mycoplasma pneumoniae* infection [3]. In that report, the patients were given PSL, not antibiotics. Antibiotics were not administered because the mycoplasma infection had merely triggered the PMR. Therefore, even if an infection sensitive to CAM was involved at the onset of PMR in case 1, the effectiveness of the CAM was thought to have been derived from its anti-inflammatory effects, and not from its antibacterial activity.

Regarding the treatment of PMR, GC remains the mainstay. GC therapy usually dramatically improves the clinical picture within a few days. Nevertheless, about one-third of patients experience disease recurrence when the dose is reduced. Long-term use of GC induces side effects, which occur in up to 60% of patients. Methotrexate (MTX) is considered a promising agent and MTX in addition to GC reduces the time for discontinuing GCs, the incidence of relapse, and the cumulative GC dose. Alternatively, TNF blocking agents were found not to be sufficiently effective [4].

Apart from their antibacterial activity, Macs exhibit a broad spectrum of pharmacological effects, including anti-inflammatory activity. Macs have been shown to affect several pathways of the inflammatory process, such as the migration of neutrophils, the oxidative burst in phagocytes, and the production of proinflammatory cytokines [1]. Via their antibacterial activity, Macs also greatly influence anti-inflammatory activity. For instance, Macs are active against periodontopathic bacteria, which are powerful stimulators of TNF-α and other proinflammatory cytokines in humans [1]. Since it was reported that the serum levels of both TNF-α and IL-6 were elevated in PMR [5], the effectiveness of CAM for PMR in our cases was thought to be derived from its anti-inflammatory effects, including suppressing the above-mentioned proinflammatory cytokine production.

Two of our patients who had already received PSL were treated with CAM. Since Macs have steroid-sparing effects, their use may be considered in patients receiving GC therapy.

Table 1. Patient characteristics

| Characteristic | Patient no. | 1 | 2 | 3 |
|----------------|-------------|---|---|---|
| Age, yr        |             | 73 | 78 | 77 |
| Sex            | Female      | Female | Male |
| ESR, mm/hr     |             | 58 |   |   |
| CPR, mg/dL     |             | 7.17 | 3.77 | 0.99 |
| Previous treatment |         | - | PSL 4 mg/day | PSL 10 mg/day |
| CAM, mg/day    |             | 400 | 400 | 400 |
| Therapeutic response |       | Good | Good | Good |

ESR, erythrocyte sedimentation rate; CPR, C-reactive protein; PSL, prednisolone; CAM, clarithromycin.
ing effects via their influence on corticosteroid metabolism, not only the above-mentioned anti-inflammatory effects but also their steroid-sparing effects might have resulted in the improved signs and symptoms.

PMR is one of the most common chronic inflammatory diseases in the elderly. As elderly patients tend to suffer from chronic diseases that are exacerbated by the use of GCs, such as diabetes mellitus, osteoporosis, and hypertension, CAM monotherapy and CAM add-on therapy might represent useful options for elderly patients with PMR.

Given that only three cases were reported here, more research is necessary before CAM therapy can be adopted widely.

**Keywords:** Polymyalgia rheumatica; Clarithromycin

**Conflict of interest**
No potential conflict of interest relevant to this article was reported.