Internal Medicine Journal 2002; 32: 315–319

ORIGINAL ARTICLE

Audit of the management of suspected giant cell arteritis in a large teaching hospital

N. DALBETH,[1] N. LYNCH,[1] L. McLEAN,[2] F. McQUEEN[1,2] and J. ZWI[1]

[1]*Auckland Healthcare and* [2]*Department of Molecular Medicine, University of Auckland, Auckland, New Zealand*

Abstract

Background: The diagnosis of giant cell arteritis (GCA) is often confirmed by an early temporal artery (TA) biopsy of adequate length. Treatment of this condition with high-dose corticosteroids may be associated with significant morbidity, including osteoporosis.

Aim: To audit current management of patients with suspected GCA at Auckland Healthcare, a large teaching hospital.

Methods: We performed a retrospective chart review of all TA biopsies from January 1996 to June 2000. A total of 117 biopsies from 111 patients was audited. Of these patients, 37/111 (33%) had a final clinical diagnosis of GCA (GCA patients). The areas of interest for audit were waiting time for TA biopsy, length of sample, initial corticosteroid therapy and osteoporosis prophylaxis.

Results: The mean waiting time for biopsy for all patients was 5.6 days (range 0–42 days). This time varied from 9.3 days for rheumatology patients to 2.6 days for ophthalmology patients ($P = 0.003$). Only 44/117 (37.6%) specimens measured more than 10 mm. For GCA patients, the median initial oral prednisone dose was 60 mg/day. Osteoporosis prophylaxis was prescribed in 24/37 (65%) GCA patients, most commonly cyclical etidronate.

Conclusions: There is significant variation in the management of GCA within our institution. This audit has highlighted several areas where improvement could be made, particularly in streamlining the process of obtaining TA biopsy and in promoting the use of osteoporosis prophylaxis. (Intern Med J 2002; 32: 315–319)

Key words: audit, corticosteroids, giant cell arteritis, osteoporosis, temporal artery biopsy.

INTRODUCTION

Giant cell arteritis (GCA) is a common form of vasculitis affecting elderly patients. Clinical features include arteritic symptoms such as headache, scalp tenderness, jaw claudication and visual disturbance, and systemic symptoms including malaise, weight loss and fatigue. Symptoms of polymyalgia rheumatica (PMR) may occur concurrently.[1] Clinical examination may demonstrate tender, thickened or pulseless temporal arteries. Although clinical findings are integral to the diagnosis of GCA, temporal artery (TA) biopsy remains an important confirmatory test.[2] Typical histological findings of active GCA include transmural inflammation, disruption of the internal elastic lamina, intimal fibrosis and oedema, and giant cells.[3] The risk of false-negative biopsy owing to 'skip lesions' is well recognized.[4] Management with high-dose corticosteroids reduces complications of disease, particularly loss of vision.[5] However, side-effects related to therapy can be significant.[6] Although there is controversy about some aspects of GCA management, good clinical practice includes a waiting time for biopsy of less than 2 weeks, specimen length of more than 10 mm and osteoporosis prophylaxis for all patients with GCA.

Correspondence: Nicola Dalbeth, MRC Human Immunology Unit, Weatherall Institute of Molecular Medicine, John Radcliffe Hospital, Oxford OX3 9DU, UK. Email: nicola.dalbeth@imm.ox.ac.uk

Received 14 May 2001; accepted 9 November 2001.

This retrospective study audited the management of suspected GCA at a large teaching hospital facility. In particular, we assessed the waiting times for biopsy, length of biopsy specimen, initial corticosteroid dose and use of routine osteoporosis prophylaxis.

METHODS

We audited all TA biopsies taken at Auckland Healthcare (Auckland Hospital and Greenlane Hospital) over a 4.5-year period between January 1996 and June 2000. This institution is a 1036-bed teaching hospital associated with the University of Auckland, and has a population catchment of 386 000 people. The biopsies were identified from a computerized database in the Department of Pathology, and confirmed by cross-referencing databases in the Departments of Rheumatology and General Surgery. A retrospective patient chart review was performed for each procedure. Results were analysed using Student *t*-tests and contingency tables on Prism 3.0 (Graph Pad, San Diego, CA, USA).

During this time, 122 biopsies were taken from 116 patients (mean 27 biopsies/year). Bilateral biopsies were performed in six patients (three sequential and three simultaneous). Medical records were not available for five patients, so that a total of 117 biopsies (114 episodes) in 111 patients was audited.

RESULTS

Temporal artery biopsies

A number of different specialties requested TA biopsies, most commonly Rheumatology and Ophthalmology. There were 82/114 (71.9%) procedures done by the General Surgery service, 30/114 (26.3%) by the Ophthalmology service, and 2/114 (1.8%) by the Neurosurgery service. Most of the biopsies requested by Rheumatology and other medical services were taken by the General Surgical service, while all biopsies requested by Ophthalmology were taken by the Ophthalmology service.

Of the TA biopsies taken, histopathologists reported 25/117 (21.4%) as being consistent with active GCA, 11/117 (9.4%) as being consistent with healed GCA, and 81/117 (69.2%) as normal or 'age-related changes' (including arteriosclerosis).

There were 37/111 (33%) patients termed 'GCA patients' for the purposes of this analysis. This group was defined as having a clinical diagnosis of GCA and was treated long term for this condition. Of these 37 patients, 25 had active GCA reported on TA biopsy, five had findings consistent with healed GCA, and seven had 'age-related changes' or normal biopsies. The seven patients with negative biopsies had otherwise typical clinical features of GCA.

Of the 11 patients with TA biopsies reported as consistent with healed GCA, only five patients were considered by the clinical team as having a final diagnosis of GCA. The remaining six patients were treated for conditions other than GCA (including polymyalgia rheumatica alone, non-specific polyarthritis, atherosclerotic stroke, cluster headache, migraine and chronic pain syndrome).

Giant cell arteritis patients

Patients with a final diagnosis of GCA had a mean age of 73.2 years (range 54–89 years). The majority of these patients were female (70%) and 95% were of European descent (the remaining 5% was of Samoan descent). There were only 7/37 (19%) patients who had symptoms for less than 1 week before presentation. The most common symptoms were headache (89%) and visual disturbance (64%). Associated PMR symptoms (either at the time of diagnosis or previously) were reported in 63%, and symptoms of jaw claudication occurred in 43%. The mean erythrocyte sedimentation rate (ESR) for this group was 77.3 mm/h (range 19–133 mm/h). There were 3/37 (8.1%) GCA patients with ESR less than 30 mm/h.

Waiting times for temporal artery biopsy

Information regarding waiting time was available for 104/114 procedures. There were 11/104 (10.6%) patients who waited for 2 weeks or more for biopsy. The mean waiting time for TA biopsy was 5.6 days. Rheumatology patients had a mean waiting time of 9.3 days (range 0–42 days). This compares with a mean waiting time of 2.6 days (range 0–9 days) for Ophthalmology patients, and 4.9 days (range 0–23 days) for General Medical patients ($P = 0.003$ for Ophthalmology *vs* Rheumatology). (Fig. 1)

Waiting times also varied depending on the surgical service performing the TA biopsy, with a mean time of 2.9 days (range 0–10 days) for Ophthalmology compared with 6.8 days (range 0–42 days) for General Surgery ($P = 0.01$).

Mean waiting times for biopsy varied from 2.8 days for those with positive biopsy results, 6.4 days for those with negative biopsy results, and 12.36 days for those with healed GCA on biopsy ($P = 0.03$, positive *vs* negative).

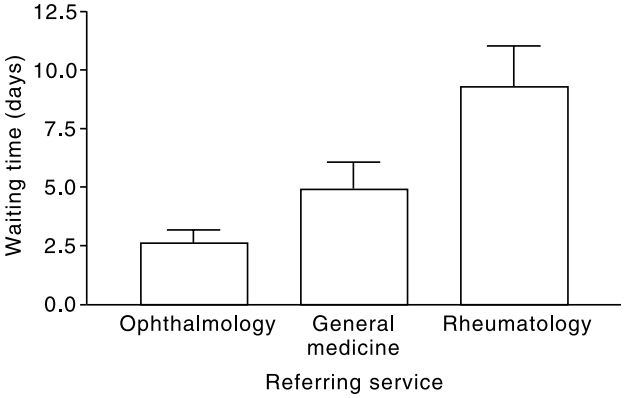

Figure 1 Waiting time for temporal artery biopsy for referring specialties. $P = 0.003$, Ophthalmology *vs* Rheumatology.

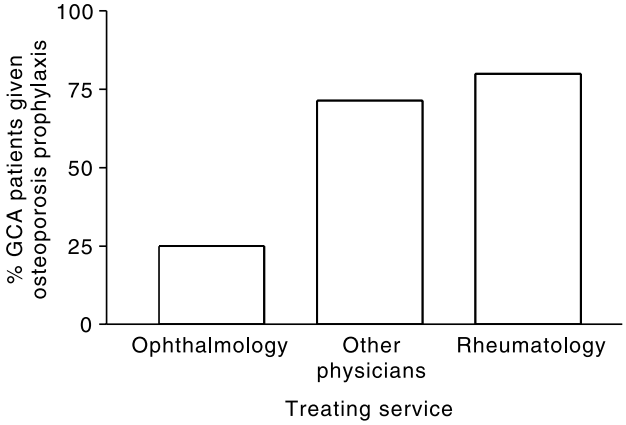

Figure 2 Osteoporosis prophylaxis use depending on treating specialty. Other physicians include General Physicians, Neurologists and Geriatricians. $P = 0.023$, Ophthalmology *vs* Rheumatology. GCA, giant cell arteritis.

Length of temporal artery biopsy

We assessed the length of TA biopsy measured by the histopathologist after formalin fixation (which may be associated with some shrinkage). Very few biopsy measurements were recorded in the clinical records by the surgical team.

Pathology measurements showed that 44/117 (37.6%) specimens measured more than 10 mm. The median biopsy length was 10 mm. There were 15/117 (12.8%) biopsies that measured 5 mm or less, and only 6/117 (5.1%) biopsies measured more than 20 mm. There was no difference in length between positive and negative TA biopsy samples.

Therapy for giant cell arteritis

Information regarding initial prednisone dosage was available for 36/37 GCA patients. For these patients, the median initial prednisone dose was 60 mg/day (range 10–80 mg/day). Only 10/36 (27.8%) patients were treated with less than 60 mg/day prednisone. Pulsed intravenous methylprednisolone was used in 4/36 (11.1%) GCA patients (two patients treated by the Neurology service, two patients treated by the Ophthalmology service, all with new onset of visual symptoms). One patient was prescribed steroid-sparing medication (methotrexate) during the follow-up period.

Initial prednisone doses varied depending on the treating specialty. The mean initial dose for Rheumatology GCA patients was 50 mg/day (range 10–60 mg) compared with 65 mg/day (range 40–80 mg) for Ophthalmology GCA patients ($P = 0.037$).

Oral prednisone doses were not significantly higher in GCA patients with visual symptoms compared with those with no visual symptoms.

Follow-up information regarding complications of corticosteroids was available for 32/37 GCA patients. There were 10/32 patients (31.2%) who had at least one complication that could be attributed to high-dose corticosteroids (including newly diagnosed diabetes mellitus, or worsening diabetic control, osteoporotic fractures, proximal myopathy and psychosis).

Use of osteoporosis prophylaxis

For GCA patients, the use of osteoporosis prophylaxis (other than calcium supplementation) was also variable, with only 24/37 (65%) receiving osteoporosis prophylaxis. For patients treated with osteoporosis prophylaxis, 20/24 (83.3%) received cyclical etidronate.

The use of osteoporosis prophylaxis other than calcium supplementation in GCA patients varied depending on treating specialty, with 12/15 (80%) Rheumatology-treated patients and 2/8 (25%) Ophthalmology-treated patients receiving such therapy ($P = 0.023$) (Fig. 2).

DISCUSSION

There is significant variation in some aspects of the initial management of suspected GCA within our large teaching hospital. This study has raised particular issues of interest, including excessive waiting

times for some biopsies, short specimen length and inadequate osteoporosis prophylaxis.

The importance of an early TA biopsy of adequate length is generally accepted, although the minimum acceptable length remains controversial. The presence of the patchy distribution of pathological lesions has led to a recognition that longer specimens should be taken.[4] It has been suggested that it is best to sample an area where clinical disease is suspected, but, failing this, at least 1 cm and preferably 2 cm of artery should be taken.[7] Almost two-thirds of the biopsies taken from the patients in our study measured 1 cm or less, suggesting that we may be obtaining inadequate specimens.

The upper limit of acceptable waiting time is also disputed. An early study[8] showed that positive biopsy rates fell from 82 to 20% after 1 week of therapy. In this study, the mean biopsy length was short, with a mean of 7 mm (similar to our mean sample length). More recently, a study from the Mayo clinic[9] showed no difference in positive biopsy rates after 2 weeks of corticosteroid therapy. However, the mean biopsy length in this study was much greater at 36 mm (with one biopsy measuring 12.5 cm) and, arguably, this may have offset the longer waiting time. Our study did not show that specimen length had a significant effect on biopsy results, although the sample size may be insufficient to detect such a difference. The finding of shorter waiting times in those with positive biopsies is interesting and may suggest the importance of obtaining early biopsies to avoid false-negative results. However, a possible confounding factor may have greater perceived urgency for those patients with more classical features of disease. The variations in waiting time between services at our institution may in part be explained by the prompt action of the Ophthalmology service in taking biopsies on their own patients.

Generally, higher doses of corticosteroids were used as initial therapy in our group of GCA patients, with considerable variation in dosage. A dose of 40 mg/day (range 30–60 mg/day) is usually considered adequate.[10] Higher corticosteroid doses may be indicated for patients with visual symptoms. Prescribing differences between ophthalmologists and rheumatologists are well recognized.[11] The high rate of corticosteroid-associated side-effects in our patients is similar to previous reported rates for GCA and PMR patients.[6] A retrospective chart review such as our study may underestimate the true incidence of therapy-related complications.

Patients with GCA are at high risk of corticosteroid-induced osteoporosis, due to advanced age and also to high prednisone doses administered for long periods. It has been demonstrated that significant bone loss occurs in the first year of corticosteroid use[12] and that prophylactic bisphosphonates[13,14] can prevent treatment-related osteoporotic fractures. Our study reinforces the need for an education programme to promote greater awareness of early routine osteoporosis prophylaxis.

In summary, this audit has demonstrated shortfalls in ideal clinical care and the need for a more coordinated approach to the management of suspected GCA at Auckland Healthcare. Such variations in the management of GCA may well occur in other large teaching hospitals. Development of evidence-based clinical guidelines and closer liaison between subspecialty services are likely to improve the care of these patients.

ACKNOWLEDGEMENTS

The authors would like to thank Professor Charles McGhee, Department of Ophthalmology, University of Auckland, and Dr Peter Gow, Rheumatologist, Middlemore Hospital, Auckland for their useful discussion of this paper.

REFERENCES

1 Hazleman B. Polymyalgia rheumatica and giant cell arteritis. In: Klippel JH, Dieppe PA (eds). Rheumatology. London: Mosby, 1998; 7.21.1–8.
2 Hall S, Lie JT, Kurland LT *et al.* The therapeutic impact of temporal artery biopsy. Lancet 1983; 2: 1217–20.
3 Ashton-Key M, Gallagher PJ. Surgical pathology of cranial arteritis and polymyalgia rheumatica. Baillieres Clin Rheumatol 1991; 5: 387–404.
4 Klein RG, Campbell RJ, Hunder GG, Carney JA. Skip lesions in temporal arteritis. Mayo Clin Proc 1976; 51: 504–10.
5 Kyle V. Treatment of polymyalgia rheumatica/giant cell arteritis. Baillieres Clin Rheumatol 1991; 5: 485–92.
6 Kyle V, Hazleman BL. Treatment of polymyalgia rheumatica and giant cell arteritis. II. Relation between steroid dose and steroid associated side effects. Ann Rheum Dis 1989; 48: 662–6.
7 Anon. Temporal artery biopsy [editorial]. Lancet 1983; 1: 396.
8 Allison MC, Gallagher PJ. Temporal artery biopsy and corticosteroid treatment. Ann Rheum Dis 1984; 43: 416–17.
9 Achbar AA, Lie JT, Hunder GG *et al.* How does previous corticosteroid treatment affect the biopsy findings in giant cell (temporal) arteritis? Ann Intern Med 1994; 120: 987–92.
10 Kyle V, Hazleman BL. Treatment of polymyalgia rheumatica and giant cell arteritis. I. Steroid regimens in the first two months. Ann Rheum Dis 1989; 48: 658–61.

11 Swannell AJ. Polymyalgia rheumatica and temporal arteritis: diagnosis and management. Br Med J 1997; 314: 1329–32.
12 Reid IR, Heap SW. Determinants of vertebral mineral density in patients receiving long-term glucocorticoid therapy. Arch Intern Med 1990; 150: 2545–8.
13 Adachi JD, Benson WG, Brown J *et al.* Intermittent etidronate therapy to prevent corticosteroid-induced osteoporosis. N Engl J Med 1997; 337: 382–7.
14 Saag KG, Emkey R, Schnitzer TJ *et al.* Alendronate for the prevention and treatment of glucocorticoid-induced osteoporosis. N Engl J Med 1998; 339: 292–9.