Epidemiology of giant cell arteritis in an Arab population: a 22-year study

Neil R Miller

Studies of the epidemiology of giant cell arteritis, an inflammatory vasculopathy that occurs in patients throughout the world, may provide an insight into the pathogenesis of the disease.

The epidemiology of giant cell arteritis (GCA) is one of its most fascinating and complex aspects. This inflammatory vasculopathy usually involves large- and medium-sized blood vessels, and often leads to devastating visual loss in one or both eyes from ischaemic damage to the retina, optic nerve or intracranial visual pathways. It is the most common vasculitis in Western countries, especially in people aged >50 years with northern European ancestry.¹⁻⁷ In these populations, annual incidence rates are 20–30/100 000. In contrast, the incidence in age- and gender-matched populations in southern Europe and in Israel is about half that of northern Europe and the USA (about 11/100 000).⁶⁻¹⁰ In Japan, the first government-supported nationwide epidemiological study on GCA showed a prevalence of only 1.47/100 000.¹¹

In this issue of the *BJO*, Chaudhry *et al*¹² (see page 715) report the results of their study on an Arab population in Saudi Arabia. They conclude that the incidence and prevalence of GCA in this population are also extremely low, probably similar to that of Japan. This was not a nationwide, prospective, population-based study, nor has one ever been carried out in any of the Arab countries in the Middle East. Nevertheless, the conclusions of the authors would seem justified if one accepts—as I do—their assumptions regarding the type and number of patients evaluated by their hospital, the only specialised tertiary eye-care facility in Saudi Arabia.

The explanation for the marked differences in incidence and prevalence of GCA in different parts of the world and among different ethnic and racial groups is multifactorial, and includes geographical, genetic and environmental factors.¹³ These factors are undoubtedly interrelated, at least to some extent.

It has been the subject of intense debate whether geographical factors truly influence the susceptibility to GCA and its manifestations or simply reflect the

genetic makeup of people who live in particular geographical locations.¹⁴ Nevertheless, there appears to be a clear geographical gradient of frequencies in GCA, with a statistically significant increase in both incidence and prevalence of the disorder with increasing northern latitudes.¹⁵

Genetic factors were first suggested by reports that showed an increased prevalence of GCA among first-degree relatives. More recently, it has been postulated that some major histocompatibility complex class II molecules have a role in the susceptibility of patients to GCA, particularly HLA-DRB1*04 alleles^{11 16-19}; major histocompatibility complex class I molecules could also be involved.²⁰ In addition, certain polymorphisms that relate to the expression of various cytokines and chemokines, including tumour necrosis factor α , intercellular adhesion molecule 1 and interleukin 1 receptor antagonist seem to influence susceptibility for both GCA and polymyalgia rheumatica.^{21 22}

Environmental factors, particularly infectious agents, have been postulated by some investigators to be the ultimate triggers for the development of GCA,²³ partly because the condition is usually characterised by constitutional symptoms, fever and an increased level of acute-phase reactants in the serum of affected people, and partly because the incidence of such phenomena has an annual and seasonal fluctuation.^{7 24} Some of the potential aetiological agents include *Mycoplasma pneumoniae*, human parvovirus B19 and human parainfluenza virus type 1.^{25 26} Although *Varicella zoster* virus (VZV) can produce a histopathological picture identical with GCA, including multinucleated giant cells,^{27 28} a study of biopsy-positive temporal arteries, using immunohistochemical and PCR techniques showed no evidence of either VZV antigen or VZV DNA in any of the specimens.²⁹ Gordon *et al*³⁰ examined whether microbial DNA fragments were present at GCA lesions and whether such microbial fragments could be associated

with disease pathogenesis. These investigators identified microbial sequences using genomic representational difference analysis. Then, they used laser dissecting microscopy to isolate cells from GCA lesions and adjacent uninvolved temporal artery. Using these techniques, they were able to isolate 10 gene fragments, three of which contained sequences with high homology with prokaryotic genes, suggesting a bacterial or viral origin. Gordon *et al* then examined serum from people with biopsy-proven GCA, compared it with that from healthy age-matched controls and found immunoglobulin G that recognised *in vitro* translated proteins from the three clones.

The paper by Chaudhry *et al*¹² (see page xxx) is consistent with the findings of others that non-European people and those who live in southern latitudes have a relatively low incidence and prevalence of GCA. The next step is to assess this relatively (genetically, geographically and environmentally) isolated population for factors that would, on the one hand, distinguish it from populations with a high incidence and prevalence of GCA, such as that in the Scandinavian countries, and on the other hand, link it to populations with an extremely low incidence and prevalence of GCA, such as those in Israel or Japan. It may well be that by comparing and contrasting these various populations, we would gain much more insight into the aetiology of this potentially vision- and life-threatening disorder.

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Results of high-density silicone oil

Results of high-density silicone oil as a tamponade agent in macular hole retinal detachment in patients with high myopia

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Treating myopic macular hole with a central retinal detachment with HDSO and the anatomical success of this procedure

In this issue, Cheung *et al*¹ (see page 719) report successful surgery for myopic macular hole with retinal detachment using high-density silicone oil (Oxane HD, Bausch & Lomb, Feldkirchen, Germany) as an endotamponade. Myopic macular hole with a central retinal detachment represents a special therapeutic challenge. For this condition, vitrectomy with various endotamponades, retinopexy, photocoagulation and removal of the inner limiting membrane is still under discussion. Several surgical approaches have been described, including vitrectomy with gas tamponade,² additional laser photocoagulation to the hole margin³ and episcleral buckling of the macular area.⁴ The success rate of vitrectomy with gas endotamponade for myopic eyes with central retinal

detachments ranges between 45% and 68%.^{5–8} Success rates up to 79% have been described when using silicone oil as an endotamponade.⁹ In 1999, Wolfensberger and Gonvers¹⁰ described a series of 11 eyes having myopic macular hole with a central retinal detachment vitrectomy with silicone oil tamponade, including photocoagulation of the hole margin that resulted in an anatomical success in >90% of eyes. However, laser coagulation leads to destruction of retinal tissue and limits the functional outcome, and should be considered only in eyes with poor visual prognosis. Factors for the limited success rate in myopic central retinal detachment with macular hole formation could be the loss of chorioretinal tissue, myopic retinal pigment epithelium atrophy and poor compliance to face-down

positioning after surgery with conventional endotamponades (eg, gas, silicone oil).

Recently, high-density silicone oils (HDSOs) have been developed as a vitreous substitute.^{11–15} The advantage of HDSO in comparison with gas and standard silicone oil is that no restriction of posturing is required postoperatively. Furthermore, it has been demonstrated that in the upright position a standard silicone oil bubble does not conform with the foveal depression.¹⁶ This results in a lack of effective tamponade on the fovea. The poor tamponade might be an explanation why visual recovery after silicone oil tamponade is less favourable than after gas tamponade.¹⁷ By contrast, HDSO shows a good tamponade effect on the foveal region in optical coherence tomography images.¹⁴ Therefore, HDSO may overcome the limitations of silicone oil in complicated macular hole surgery.

In their uncontrolled pilot study of 12 eyes, Cheung *et al*¹ describe the use of Oxane HD for myopic macular hole with retinal detachment. The surgical outcomes were promising, with 83% successful macular hole closure and reattachment after a single surgery with a mean follow-up of 12 months. The results compared favourably with other surgical techniques for myopic macular hole retinal detachment. Significant side effects related to the HDSO were not observed in this pilot study. In particular, no intraocular inflammation¹⁸