Review Article

A narrative review of giant cell arteritis in China

Edsel B. Ing[1]^, Alis Qinyuan Xu[2], John Liu[2], Felix Tyndel[1,3], Arun N. E. Sundaram[1,3], Wai Ching Lam[1,4]

[1]Department of Ophthalmology, University of Toronto, Toronto, Canada; [2]Department of Family Medicine, University of Toronto, Toronto, Canada; [3]Department of Neurology, University of Toronto, Toronto, Canada; [4]Department of Ophthalmology, The University of Hong Kong, Hong Kong, China

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Correspondence to: Edsel B. Ing, MD, FRCSC, MPH, MIAD, PhD. Michael Garron Hospital, 650 Sammon, K306m Toronto, ON, Canada.
Email: edinglidstrab@gmail.com.

Objective: To determine the incidence of giant cell arteritis (GCA) in China.

Background: GCA is the most common primary vasculitis in the elderly and can cause bilateral irreversible blindness, aortitis, stroke and rarely death. The incidence of GCA in China is thought to be low, but has not been formally examined.

Methods: A narrative review of the English language publications concerning GCA in China was performed on the PubMed and Google Scholar databases from inception to May 30, 2021.

Conclusions: Five case series of GCA patients in China from Beijing, Changsha and Hong Kong showed the average number of GCA patients at the different hospitals varied from 1.7 to 9.6 patients per year. A retracted, outlier study from Lanzhou, China reported up to 336 patients per year. Latitude, smoking prevalence, percentage of Han Chinese ancestry, and average life expectancy in each city did not seem to influence the number of GCA patients. Excluding the outlier study, the incidence of GCA in China remains low. Overlap in the diagnosis of GCA with Takayasu arteritis may account for reports of higher relative incidence. To determine accurate incidence rates for GCA in China future studies require an accurate age-appropriate population denominator.

Keywords: Giant cell arteritis (GCA); epidemiology; China

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Introduction

Giant cell arteritis (GCA) is the most common primary vasculitis of the elderly and can cause blindness, aortitis and stroke. The incidence of GCA varies by case definition and geographic location and may be as high as 43.6 cases per 100,000 individuals 50 years of age or older in Iceland (1). Northern Europe is thought to have the highest incidence of GCA, the rest of Europe has an intermediate incidence, while Japan and Asia report few cases of GCA (1-3). A small North American series of 38 patients with biopsy-proven GCA suggested that GCA is thirty times less frequent in Asians than Caucasians (4). However, the incidence of GCA in China has not been formally summarized in a narrative review. We present the following article in accordance with the Narrative Review reporting checklist (available at https://dx.doi.org/10.21037/lcm-21-18).

^ ORCID: 0000-0003-0623-0934.

Table 1 Reports of GCA from various cities in China

Paper (year)	City	Latitude	Age, years	% male	Population per city in millions (9)	Life expectancy per city (10)	Smoking prevalence per city (11), men/women	% age Han Chinese	Reported GCA patients/year
Zou *et al.* (5) (in 2019)*	Lanzhou	36° N	61.1	48	3.1	74.5 (in 2020)	41.2%/1.8	99.8 (2)	140 to 336
Zhang *et al.* (6) (in 2019)	Beijing** (1/1998–12/2017)	40° N	65.3	45	20.4	82.2 (in 2018)	41.5%/2.1	95.7 (12)	4.6
Chu *et al.* (7) (in 2019)	Beijing** (11/1998–10/2017)	40° N	65.3	45	20.4	82.2 (in 2018)	41.5%/2.1	95.7 (12)	3.2
Sun *et al.* (8) (in 2016)	Beijing** (9/1992–5/2014)	40° N	66.4	50	20.4	82.2 (in 2018)	41.5%/2.1	95.7 (12)	3.2
Tam *et al.* (13) (in 2008)	Hong Kong	22° N	≥67.7	32	7.5	84.7 (in 2017)	18.6%/3.2	92.0 (14)	3.8 to 4.8
Hu *et al.* (15) (in 2002)***	Changsha	28° N	43.1	94	4.6	79.1 (in 2017)	–	99.2 (16)	1.7 to 9.6

*, the article by Zou et al. has been retracted, but the publication is still online. **, these studies were all from the Peking Union Medical College (PUMC) with overlapping time frames. ***, only 3 of the patients in Hu's series were 50 years of age or older, and perhaps Takayasu arteritis patients were included. Thirteen of the sixteen patients diagnosed with GCA met the American College of Rheumatology criteria for GCA. % male: percent male; % age: percentage. GCA, giant cell arteritis.

Methods

Literature searches were performed on Pubmed and Google Scholar from inception until May 30, 2021, using the keywords "giant cell arteritis", "temporal arteritis", "China" and "Chinese". All case series were included, but isolated case reports were excluded. The number of patients from each hospital and the duration of the chart review were used to determine the annual number of GCA patients per year from each institution. If the study only specified the year without information about the months of the study a minimum and maximum time range was used to calculate the annual number of GCA patients per year. The latitude, life expectancy, smoking prevalence and percentage of Han Chinese ancestry of each city corresponding to the location of the hospital were tabulated. Except for the study by Tam *et al.* an incidence rate could not be calculated, because the population denominator of patients 50 years of age or over in the catchment area serviced by each hospital could not be precisely determined.

Discussion

Six case series of GCA from China were found on the literature review (5-16) and summarized in *Table 1*. The article by Zou *et al.* (5) was retracted a year later. It is unclear if Zou's radiology article was retracted due to problems with the radiologic aspects of the article rather than epidemiology. To examine the totality of evidence and avert possible publication bias, the information from Zou's paper was placed in the Table 1.

The three GCA studies from Beijing (6-8) originated from the Peking Union Medical College and had large overlaps in their time frames of study.

The incidence rate of GCA by country per 100,000 population aged 50 years or greater varies from 0.34 in Hong Kong (13) to 43.6 in Iceland (1). The incidence rate of GCA in mainland China appears to be low, but indeterminate for the hospitals in mainland China because the referral patterns and population denominator for each institution were not accurately discernable.

Also, the overlap between Takayasu arteritis and GCA may make it difficult to determine figures accurately.

GCA is a disease of immunosenescence, and age is the major risk factor for GCA in North America (16). The city in China with the highest life expectancy was Hong Kong, but it did not have the highest number of annual GCA patients per institution.

In general, more patients with GCA are female but

this may be because women outlive me in most societies, including China (17). The GCA patients in Hu's series were predominantly male and exceptionally young for GCA and likely had Takayasu arteritis. Gender was not a statistically significant predictor for GCA in North America (18).

There may be a genetic predisposition for GCA and an association with HLA-DRB1*04 (19). We could not find an association between Han Chinese ancestry and HLA-DRB1*04.

Infections such as shingles may minimally increase the risk of GCA (20) but vitamin D insufficiency (21), sunlight and latitude (22) have not been definitively shown to influence GCA. We were unable to locate city-specific data for herpes zoster infection or vitamin D levels for the cities in *Table 1*.

Hong Kong had the lowest prevalence of male smokers, and the prevalence of smokers in Lanzhou was not different from Beijing (11). Although smoking may increase the risk of GCA (23) it does not appear to correlate with the frequency of GCA in the four Chinese cities in *Table 1*.

Lanzhou, China has the smallest population and lowest life expectancy of the 4 cities in the table, but had 30–70 fold more GCA patients than Beijing. Ethnic intermingling in Lanzhou does not explain the high number of GCA patients in Lanzhou, given the report of 99.8% Han Chinese ancestry. Geographic factors do not seem to explain the high number of GCA patients in Lanzhou either; the latitude of Lanzhou is 36° N which is comparable to Beijing at 40° N.

Given the high number of GCA patients in the reports by Zou *et al.* and Hu *et al.*, it is plausible that patients with Takayasu arteritis were inadvertently included as GCA. Traditionally, the key difference between Takayasu and GCA was age. Patients with Takayasu are younger and have less temporal artery involvement than GCA patients, but may have more carotidynia and limb claudication (24). Notwithstanding, Takayasu arteritis and GCA have many strong similarities and the arteriographic patterns of disease may overlap in 56% of North American patients (25). If the Changsha and Lanzhou data represent true cases of GCA, then further genetic or environmental studies in these regions may help to unravel the etiology of GCA.

Conclusions

In summary, the reported incidence rate of GCA in Hong Kong is low at 0.34 per 100,000 patients 50 years of age or older and is also likely rare in mainland China. Although GCA may be rare it can cause irreversible blindness, aortitis and stroke. As such accurate incidence studies are required to determine the disease burden, and for public health planning.

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Footnote

Reporting Checklist: The authors have completed the Narrative Review reporting checklist. Available at https://dx.doi.org/10.21037/lcm-21-18

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