Response to: "Halo Score': missing large vessel giant cell arteritis– do we need a modified 'Halo Score?" by Chattopadhyay and Ghosh

We thank Chattopadhyay and Ghosh for their interest in our paper describing a novel ultrasonographic Halo Score for giant cell arteritis (GCA).[1] The Halo Score quantifies the extent of inflammation in the three temporal artery segments and axillary arteries.[2] The total score is the sum of all halo grades, which reflect the thickness of each halo. Halo grades of the axillary arteries are multiplied by a factor of 3 in order to give equal weight to inflammation of the cranial and large systemic arteries. Chattopadhyay and Ghosh underscore the importance of ultrasonography for the diagnosis of GCA, and recognise the potential of the Halo Score for the monitoring of disease activity. The authors propose to include the subclavian artery into the Halo Score and to use it for patients with Takayasu arteritis.

Chattopadhyay and Ghosh suggest that the subclavian artery is more frequently affected by GCA than the axillary artery; and that the Halo Score could thus underestimate the extent of inflammation. The authors refer to the study by Muratore *et al*,[3] who used computed tomography angiography (CTA), magnetic resonance angiography (MRA) or (18F)-fluorodeoxy-glucose positron-emission tomography (FDG-PET) to evaluate large vessel involvement in patients with GCA. Although this was an excellent study, it might not be suitable for comparing the involvement of subclavian and axillary arteries in GCA. The presence of an abnormal subclavian artery *per se* was the main selection criterium for patients with large vessel GCA to enter the study.[3] Most ultrasonography studies in GCA have actually demonstrated that arterial wall swelling more often occurs in the axillary arteries than in the subclavian arteries (table 1).[4–8] Wall swelling of the subclavian arteries in the absence of vasculitic changes in the axillary arteries was only seen in 2%–8% of patients with large vessel GCA.[4 7] It is noteworthy that the ultrasonographic assessment of the facial and occipital artery also provides limited diagnostic yield in addition to that of the temporal artery.[9 10] Clinical guidelines for GCA therefore recommend temporal and axillary artery ultrasonography as the first-line investigation for GCA.[11 12] The Halo Score correlated well with systemic inflammation (eg, C-reactive protein levels) in patients with GCA.[2] We believe that inclusion of the subclavian artery in the Halo Score is not essential for estimating the burden of inflammation in GCA.

Feasibility is another reason why additional arteries should not necessarily be incorporated in the Halo Score. The investigation of more arteries will require extra time and clinical effort. Furthermore, the evaluation of particular arteries can be challenging. For instance, the subclavian artery is located deeper than the axillary artery. Lower ultrasound frequencies are therefore needed to evaluate the subclavian artery, which affects the resolution of the images. This could potentially limit the measurement of the halo thickness; especially in obese persons. The addition of more arteries to the Halo Score might affect its clinical applicability.

We agree with Chattopadhyay and Ghosh that ultrasonography is an important diagnostic modality in Takayasu arteritis. However, temporal and axillary artery involvement is not a prominent finding in Takayasu arteritis.[13] The Halo Score, which was developed for GCA, might not be well-suited to quantify the extent of inflammation in Takayasu arteritis. We expect that an alternative Takayasu Halo Score incorporating other large vessels could be more relevant in Takayasu arteritis.[13 14] This of course requires further investigation.

In conclusion, we do not believe that we need a modified Halo Score in order to estimate the burden of inflammation in patients with GCA. However, the development of a dedicated Takayasu Halo Score could be of interest.

Kornelis S M van der Geest [1,2] Bhaskar Dasgupta [2]

[1]Rheumatology and Clinical Immunology, University Medical Center Groningen, University of Groningen, Groningen, The Netherlands
[2]Rheumatology, Southend University Hospital NHS Foundation Trust, Westcliff-on-Sea, UK

Correspondence to Kornelis S M van der Geest, Rheumatology and Clinical Immunology, University Medical Center Groningen, University of Groningen, 9712 CP Groningen, The Netherlands; k.s.m.van.der.geest@umcg.nl

Handling editor Josef S Smolen

Twitter Bhaskar Dasgupta @profbdasgupta

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ORCID iDs
Kornelis S M van der Geest http://orcid.org/0000-0003-2798-6765
Bhaskar Dasgupta http://orcid.org/0000-0002-5523-6534

Table 1 Subclavian and axillary artery involvement in patients with large vessel GCA at diagnosis.

Study	Patients with LV-GCA (n)	Patients with subclavian artery involvement (n (%))	Patients with axillary artery involvement (n (%))
Schmidt *et al*[4]	53	32 (61)	51 (96)
Ghinoi *et al*[5]	15	9 (60)	3 (20)
Czihal *et al*[6]	59	36 (61)	53 (90)
Löffler *et al*[7]	26	14 (54)	18 (69)
Aschwanden *et al*[8]	42	8 (19)	13 (31)

Overview of ultrasonography studies reporting a paired assessment of subclavian and axillary arteries in patients with large vessel GCA (LV-GCA) at diagnosis. No overlap in patients existed among these five studies.
GCA, giant cell arteritis.

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