Cranial ultrasound may replace temporal artery biopsy in diagnosis of giant cell arteritis

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A new study presented for the first time today at the European League Against Rheumatism Annual Congress (EULAR 2014), shows that cranial ultrasound has a greater sensitivity than temporal artery biopsy,* and a comparable specificity in the diagnosis of Giant Cell Arteritis (GCA).[1]

Giant Cell Arteritis (GCA), a condition in which medium and large arteries mainly in the head and neck, become inflamed and narrowed, can cause blindness due to occlusion of the artery supplying the back of the eye. It is therefore essential that a prompt, accurate diagnosis of GCA is made and treatment with high dose steroids started as soon as possible. Currently there are no 100% accurate diagnostic tests for GCA. Patients typically present with severe headache and scalp tenderness located to one or both sides of the forehead. However, GCA can be difficult to distinguish from other less serious causes of headache.

In this study, cranial ultrasound was the strongest predictor for a diagnosis of GCA when results were evaluated against a confirmed clinical diagnosis at three months. In contrast, the existing American College of Rheumatology (ACR) criteria that include TAB,† when used alone, were insufficiently specific to accurately predict or exclude the diagnosis of GCA at three months. Relying on ACR criteria alone would therefore be leaving patients at risk of missing out on potentially sight-saving steroid treatment, or of being treated with high dose steroids

unnecessarily.

"Although temporal artery biopsy (TAB) has historically been considered the 'gold standard' diagnostic test for GCA, the exciting results of this new study suggest cranial ultrasound may soon replace TAB in the assessment of patients with a suspected diagnosis of GCA in routine clinical practice," said lead author Dr Adam Croft from the Centre for Translational Inflammation Research, University of Birmingham, UK.

"Patients with symptoms and signs of GCA can now be offered a much simpler, more accurate diagnostic test. The high predictive accuracy of cranial ultrasound over temporal artery biopsy indicated that temporal artery biopsy may now be unnecessary, particularly where clinical suspicion of GCA is high or quite low," Dr Croft added.

Out of a total of 87 patients who underwent cranial ultrasound for suspected GCA, 36 patients (41%) had a confirmed clinical diagnosis at the three month follow-up. Of the 30 patients who had a positive cranial ultrasound, 29 (96%) went on to have a confirmed diagnosis of GCA at three months. Of the 36 patients with more than three ACR criteria†, only 21 (58%) had a diagnosis of GCA confirmed at three months.

"Being able to reliably confirm the diagnosis is important not just to ensure those patients with GCA receive high-dose steroids to help prevent blindness, but also to prevent patients who don't have GCA continuing high-dose steroid therapy unnecessarily. High doses of steroids can cause a variety of unpleasant side effects including weight gain, infection risk, osteoporosis and fracture risk, high blood pressure, diabetes, cataracts," Dr Adam Croft explained.

When compared to clinical diagnosis at three months, the sensitivity of cranial ultrasound was 81%, specificity 98%, positive likelihood ratio

41, negative likelihood ratio 0.2, positive predictive value of 97% and negative predictive value of 88%. In contrast, when compared to clinical diagnosis at three months TAB had a sensitivity of 53%, specificity 100%, positive likelihood ratio 2.3, negative likelihood ratio 0.2, positive predictive value of 100% and negative predictive value of 47%. Over the last 25-30 years, GCA has been found to be the most common type of vasculitis in Europe and North America, especially in people aged >70 years. GCA mainly affects white individuals, and it almost exclusively occurs in subjects aged >50 years. The cause of giant cell arteritis is unclear; however, it is thought that a combination of genetic and environmental factors, such as an infection may be responsible.[2] Prompt treatment of GCA with high dose steroids is essential to prevent permanent loss of vision. In one study, 14% permanently lost vision because of GCA, and in 94% of these patients the visual deficit developed before steroid therapy for GCA was begun.[3]

In this study, all patients undergoing cranial ultrasound between January 2005 and July 2013 were identified and clinical data obtained from electronic records, and, if necessary primary care providers. ACR criteria for GCA were used to classify patients.

Ultrasound reports were independently classified according to whether there was evidence of an arteritis or not. Explicit ultrasound features of GCA, such as a halo sign were not required to make this determination. The relationship between the ACR criteria alone or in combination with ultrasound and a final clinical diagnosis of GCA (made after a minimum of three-month follow-up) was analysed. A clinical diagnosis of GCA after three months of follow up served as the gold standard. The sensitivity and specificity of cranial ultrasound and of TAB were examined against this gold standard.

More information: Abstract Number: OP0056

1 Croft A, Thompson N, Duddy M. et al. Can we replace temporal artery biopsy with cranial ultrasound for the diagnosis of giant cell arteritis? A retrospective cohort study of the diagnostic utility of ultrasound in routine clinical practice. EULAR 2014; Paris: Abstract OP0056
2 Gonzalez-Gay MA, Vazquez-Rodriguez TR, Lopez-Diaz MJ, et al. Epidemiology of giant cell arteritis and polymyalgia rheumatica. Arthritis Rheum. 2009; 61(10):1454-61 3 Aiello PD, Trautmann JC, McPhee TJ, et al. Visual prognosis in giant cell arteritis. *Ophthalmology*. 1993 Apr;100(4):550-5

* minor procedure performed under local anaesthetic to remove a sample of one of the scalp arteries † Three or more of the following: age ≥ 50; new onset headache; tenderness or reduced pulsation of the temporal artery; elevated blood erythrocyte sedimentation rate; and positive TAB

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