Multiple intracranial arteritis and hypothyroidism secondary to *Streptococcus anginosus* infection

A 50-year-old Chinese woman reported a sharp paroxysmal headache and abrupt paralysis of the left leg. She then developed ptosis, blurred vision, diplopia and fever. On admission, a neurological examination revealed right III, IV, VI and left V1 cranial nerve palsy, bilateral upper eyelid oedema and left leg monoplegia (Medical Research Council grade 2/5). In addition, a left Babinski sign and nuchal rigidity were observed. Blood tests revealed elevated white cell count (WCC) and a majority of the cells were neutrophils. Lumbar puncture revealed that the WCC (120×10⁶/μL) and protein level (0.79 g/L) of the cerebrospinal fluid (CSF) were slightly elevated, though the intracranial pressure was normal. A cranial MRI showed an infarction in the right corona radiata and base of the skull structures were also involved. MR arteriography indicated that multiple intracranial large arteries were narrowed. Moreover, the CSF culture indicated *Streptococcus anginosus* infection, which was diagnostically very important. Accordingly, the patient was treated with vancomycin, tinidazole, low-molecular-weight heparin calcium and dexamethasone for 2 weeks. She achieved remission of the neurological symptoms but her heart rate gradually slowed (45–65 bpm) and blood pressure decreased (75–90/45–50 mm Hg). She became depressed and developed apathy towards food. The Mini-Mental State Examination score (23/30) mainly indicated memory deterioration, disorientation and partial acalculia. The results of timely blood pituitary function tests indicated considerably decreased free T₃, free T₄ and thyroid-stimulating hormone levels, which indicated primary hypothyroidism. After subsequent administration of 12.5 mg/day levothyroxine for 2 months, the patient’s heart rate and blood pressure were normalised and mental status returned to normal.

At this point, a CSF bacterial culture established the specific pathogen to be *S. anginosus*, a member of the *Streptococcus milleri* group colonising the human oral cavity, pars pharyngeal pharynges. When a healthy individual’s immunity declines, opportunistic infection with *S. anginosus* may occur. Apart from causing a toothache and headache, the infection may spread intracranially to cause meningitis and cerebral venous system thrombophlebitis. Inflammation may also spread to the carotid sheath through the parapharyngeal space. Monoplegia and hemiplegia are rare specific features secondary to *S. anginosus* infection.

*Figure 1*  Brain parenchoma, meninges and cerebral vascular angiography studies. (A) Transverse view of diffusion-weighted imaging demonstrates infarction in the right corona radiata. (B and C) MR enhancement showed obvious involvement of the saddle area, pituitary stalk and tentorium of cerebellum. (D and E) MR angiography indicates narrowing of A2 segments of the bilateral anterior cerebral artery, a narrowed M2 segment in the right middle cerebral artery and cavernous segments in the right internal cervical artery; but the venous system was not obviously constricted except for thinness of the left transverse sinus, sigmoid sinus and internal jugular vein.
due to cerebral infarction are possible complications of arterial thrombosis. Considering the inflammatory mechanisms involved in the coagulant system, an early anticoagulation treatment of cerebral infarction is necessary. In the present case, the enhancement of the pituitary stalks on MRI and the presentation of primary hypothyroidism indicate partial pituitary insufficiency, which is also rarely reported. Theoretically, the cause might have involved the impairment of the hypothalamus–pituitary–thyroid axis through inflammatory damage to the pituitary stalk. The patient’s favourable outcome confirmed the validity of the thyroxine replacement therapy.

We found that the initial CSF WCC that resulted from the S. anginosus intracranial infection, which is similar to those in viral infections, was considerably lower than that in typical acute bacterial meningitis, in which the count could reach thousands per microlitre in CSF. This may be a unique trait of the bacteria that needs to be investigated. Because the bacteria are facultative aerobes, early use of ceftriaxone, meropenem or vancomycin with tinidazole is necessary.

Chao Zhang, Bingdi Xie, Fu-Dong Shi, Junwei Hao

1Department of Neurology, Tianjin Neurological Institute, Tianjin Medical University General Hospital, Tianjin, China
2Department of Neurology, Barrow Neurological Institute, St. Joseph’s Hospital and Medical Center, Phoenix, Arizona, USA

Correspondence to Dr Junwei Hao, Department of Neurology, Tianjin Neurological Institute, Tianjin Medical University General Hospital, Tianjin 300052, China; hjw@tjmu.edu.cn

Contributors All the authors were responsible for the study concept and design; acquired, analysed and interpreted the data; supervised and coordinated the study; and drafted/revised the manuscript for content.

Funding This work was financially supported by the National Basic Research Program of China (2013CB966900 to F.D.S), the National Natural Science Foundation of China (81322018, 81100887 and 81100887 to J.W.H), the Program for New Century Excellent Talents in University of China (NCET 111067 to J.W.H), and the Key Project of Natural Science Foundation of Tianjin Province (12JCZDJC24200 to J.W.H).

Competing interests None.

Patient consent Obtained.

Ethics approval The present study was approved by the ethics committee of Tianjin Medical University General Hospital.

References

Multiple intracranial arteritis and hypothyroidism secondary to *Streptococcus anginosus* infection

Chao Zhang, Bingdi Xie, Fu-Dong Shi and Junwei Hao

*J Neurol Neurosurg Psychiatry* 2015 86: 1044-1045 originally published online August 20, 2014
doi: 10.1136/jnnp-2014-308048

Updated information and services can be found at:
http://jnnp.bmj.com/content/86/9/1044

*These include:*

**Supplementary Material**
Supplementary material can be found at:
http://jnnp.bmj.com/content/suppl/2015/06/30/jnnp-2014-308048.DC1

**References**
This article cites 5 articles, 0 of which you can access for free at:
http://jnnp.bmj.com/content/86/9/1044#BIBL

**Open Access**
This is an Open Access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: http://creativecommons.org/licenses/by-nc/4.0/

**Email alerting service**
Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

**Topic Collections**
Articles on similar topics can be found in the following collections

To request permissions go to:
http://group.bmj.com/group/rights-licensing/permissions

To order reprints go to:
http://journals.bmj.com/cgi/reprintform

To subscribe to BMJ go to:
http://group.bmj.com/subscribe/