Editorial

Neuroinflammation Update: New Insights and Future Directions

Kevin Rostasy¹

¹ Division of Pediatric Neurology, Department of Pediatrics I, Innsbruck Medical University, Innsbruck, Austria

Neuropediatrics 2013;44:295–296.

The recent discovery that mutations in the innate immune response that predispose children to Herpes simplex virus encephalitis or autoantibody-mediated diseases (e.g., *N*-methyl-D-aspartate encephalitis) have deepened our knowledge about the diverse spectrum of acquired inflammatory diseases of the central nervous system (CNS).^{1,2} The detection of immunoglobulin G (IgG) antibodies against aquaporin-4 (AQP4) in subjects with neuromyelitis optica (NMO) and the subsequent proof that these autoantibodies are instrumental in the disease process have further drawn attention to B-cell-mediated mechanisms in acquired inflammatory demyelinating diseases, such as, multiple sclerosis (MS) and acute disseminated encephalomyelitis (ADEM).^{3,4}

This emerging field of pediatric neurology that shares common ground with other pediatric specialties, including infectious diseases, rheumatology, oncology, and psychiatry, was one of the main topics at the 39th Annual Meeting of the Society of Neuropediatrics at Innsbruck, Austria.

For this special edition of *Neuropediatrics* entitled “Neuroinflammation Update: New Insights and Future Directions,” we asked the speakers of plenary sessions with a neuro-immunological focus to provide an overview of the new developments and their consecutive clinical relevance based on their presentations at the 39th Annual Meeting of the Society of Neuropediatrics at Innsbruck, Austria.

The topics chosen are diverse and reflect the different areas of pediatric neurology in which neuroinflammation plays an important primary or secondary role in the disease process. The first contribution is by Rostasy and Reindl that addresses the role of autoantibodies in inflammatory demyelinating diseases of the CNS with a particular focus on anti-myelin oligodendrocyte glycoprotein-IgG antibodies, which are present in a subgroup of patients with ADEM, AQP4-IgG seronegative NMO, and recurrent optic neuritis.⁵ In the second article, Tardieu and Deiva describe the mimics of childhood MS, providing important clues for the reader on how to separate the different diseases.⁶ The third contribution is by Kornek who gives a detailed overview of the current

treatment regimens for children and the emerging new oral medications for adult patients with MS, which will have major implications for children with MS in the future.⁷ Muller-Felber and colleagues provide an extensive review of pediatric idiopathic inflammatory myopathies with an update on diagnostic and treatment strategies.⁸ Hero and Schleiermacher report what is known about opsoclonus-myoclonus syndrome (OMS). They further introduce the OMS-European treatment trial to a wider audience that has started recruiting children this year and underscores the fact that international collaboration is mandatory to improve the care of children with rare neurological diseases.⁹ Ravizza et al contributed an excellent article on the importance of immune activation in the brain and its possible pathogenetic role in the propagation and maintenance of seizures.¹⁰ The next invited article by Mohammad et al gives an update on the role of autoantibodies in children with movement disorders.¹¹

The next article is by Zotter et al who show that children after an episode of Lyme neuroborreliosis (LNB) have a normal neuropsychological profile in contrast to their adult counterparts who report symptoms, including memory problems and attention deficits.¹²

Last but not least, we have a book review by Boltshauser for the benefit of the readers.¹³ We hope this compilation meets the expectations of the readers of *Neuropediatrics* and proves to be informative and interesting.

References

- 1 Casrouge A, Zhang SY, Eidenschenk C, et al. Herpes simplex virus encephalitis in human UNC-93B deficiency. *Science* 2006; 314(5797):308–312
- 2 Dalmau J, Gleichman AJ, Hughes EG, et al. Anti-NMDA-receptor encephalitis: case series and analysis of the effects of antibodies. *Lancet Neurol* 2008;7(12):1091–1098
- 3 Papadopoulos MC, Verkman AS. Aquaporin 4 and neuromyelitis optica. *Lancet Neurol* 2012;11(6):535–544

Address for correspondence
Kevin Rostasy, MD, Division of
Pediatric Neurology, Department
of Pediatrics I, Medical University
Innsbruck, Anichstrasse 35,
A-6020 Innsbruck, Austria
(e-mail: kevin.rostasy@uki.at).

Issue Theme Neuroinflammation
Update: New Insights and Future
Directions; Guest Editor, Kevin
Rostasy, MD.

© 2013 Georg Thieme Verlag KG
Stuttgart · New York

DOI <http://dx.doi.org/10.1055/s-0033-1360669>.
ISSN 0174-304X.

- 4 Meinl E, Krumbholz M, Hohlfeld R. B lineage cells in the inflammatory central nervous system environment: migration, maintenance, local antibody production, and therapeutic modulation. *Ann Neurol* 2006;59(6):880–892
- 5 Rostasy K, Reindl M. Role of autoantibodies in acquired inflammatory demyelinating diseases of the central nervous system in children. *Neuropediatrics* 2013;44(6):297–301
- 6 Tardieu M, Deiva K. Rare inflammatory diseases of the white matter and mimics of multiple sclerosis and related disorders. *Neuropediatrics* 2013;44(6):302–308
- 7 Kornek B. Treatment of pediatric multiple sclerosis. *Neuropediatrics* 2013;44(6):309–313
- 8 Muller-Felber W, Wanschitz J, Vill K, Baumann M. Pediatric idiopathic inflammatory myopathies: an update on diagnostic and treatment strategies. *Neuropediatrics* 2013;44(6):314–323
- 9 Hero B, Schleiermacher G. Update on pediatric opsoclonus myoclonus syndrome. *Neuropediatrics* 2013;44(6):324–329
- 10 Ravizza T, Kostoula C, Vezzani A. Immunity activation in brain cells in epilepsy: mechanistic insights and pathological consequences. *Neuropediatrics* 2013;44(6):330–335
- 11 Mohammad SS, Ramanathan S, Brilot F, Dale RC. Autoantibody-associated movement disorders. *Neuropediatrics* 2013;44(6):336–345
- 12 Zotter S, Koch J, Schlachter K, et al. Neuropsychological profile of children after an episode of neuroborreliosis. *Neuropediatrics* 2013;44(6):346–353
- 13 Boltshauser E. Disorders of the spinal cord in children [Book Review]. *Neuropediatrics* 2013;44(6):354