proportional to the degree of mitochondrial heteroplasmy. Both individuals showed common denominator of variably expressed abnormities of the neuronal migration resulting in cortical mild microdysgenesis and wide-spread neuronal heterotopia in the white matter.

Conflicts of Interest:

None.

Abstract A15

The Role of RVLM and PACAP in Sympathetic Response and Breathing Stability

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Intermittent hypoxic (IHx) episodes are typically a consequence of sleep apnea in adults and immature respiratory control in preterm infants. Chronic IHx contributes to immediate and long term co-morbidities including long-term cardiorespiratory instability. Despite intensive investigation, molecular mechanisms linking IHx to cardiorespiratory instability remain poorly understood.

We report that PACAP, a highly conserved excitatory neuropeptide which can function as an "*emergency response*" co-transmitter in the sympathoadrenal axis, plays a significant role in activating the sympathetic responses to hypoxia and stabilizing respiration. Further, we show that the effect of PACAP on the sympathetic response to intermittent hypoxia in adult rats is mainly regulated at the rostro-ventral-lateral medulla (RVLM).

To show the role of RVLM and PACAP in sympathetic response and breathing stability we used an *in vivo* anesthetized artificially ventilated rat preparation, as well as a neonatal rat *in situ* working heart-brainstem preparation and whole-body plethysmography.

Our data showed that inhibition of PACAP at the RVLM is able to dampen facilitated sympathetic activity caused by IHx. PACAP treated *in-situ* neonatal rat preparations with carotid bodies denervated showed less short-term variability in phrenic nerve output frequency when compared with vehicle treated preparations. All PACAP-null mice ($n = 5$) died when exposed to acute IHx while all wild-type mice survived. Both frequency and minute ventilation were significantly decreased in PACAP-null mice during the last hypoxia. In another set of experiments we showed that exogenous PACAP replacement in PACAP-null mice can increase the survival rate by up to 80%.

Our data suggests a regulatory role for PACAP in the development of the sympathetic response and cardiorespiratory stability after exposure to IHx in adult and neonatal mice. The effect of PACAP on sympathetic plasticity is shown to be mediated through its action in the RVLM. To our knowledge and of great importance, PACAP is the first neuropeptide that is shown to be necessary to survive IHx.

Conflicts of Interest:

None.

Abstract A16

Widening histologic spectrum of myopathy with plasma cell dyscrasia

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Background: Myopathy associated with plasma cell dyscrasia is rare. Reported cases include paraneoplastic and paraproteinaemic disease (poly/dermatomyositis-like; light chain deposition disease; amyloidosis), or focal mass lesions. Histologic data are scarce.

Case: A 74-year-old male presented with five months of progressive, symmetric shoulder and quadriceps weakness and wasting. Electrophysiologic studies suggested myositis, ESR was greater than 120 mm/hr, and the CK was around 1000 IU/L. Deltoid biopsy was initially reported as inflammatory myopathy with dystrophic features. Upon review, sheets of CD138-positive plasma cells filled with abundant Russell bodies were identified, mimicking round atrophic muscle fibres. Muscle fascicles showed dense focal lymphoplasmacytic inflammation, muscle fibre necrosis, and fibroadipose replacement. Plasma cells were kappa light chain restricted. A diagnosis of plasma cell dyscrasia was made.

Conclusion: We report a case of symmetric proximal muscle weakness and wasting with a histologic diagnosis of light chain restricted plasma cell infiltration and lymphoplasmacytic myositis. Symmetry of muscle involvement suggests a combination of paraproteinaemic, paraneoplastic, and diffusely infiltrative processes. This case may add a new histologic variant to the spectrum of myopathies associated with plasma cell dyscrasia.

Conflicts of Interest:

None.

Abstract A17

Dorsal root ganglia in Friedreich ataxia: The critical role of satellite cells

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Friedreich ataxia (FA) causes a complex clinical and neuropathological phenotype. Dorsal root ganglia (DRG) are a primary target of the disease. Traditional interpretation of the DRG lesion includes atrophy of large neurons, proliferation of satellite cells,

and formation of residual nodules. A systematic immunohistochemical and immunofluorescence study of DRG in 15 FA cases and 12 controls, however, supports the conclusion that frataxin deficiency in FA primarily affects satellite cells, and that loss of ganglion cells is due to failing trophic support and inflammatory infiltration.

A panel of antibodies was used to reveal the cytoplasm of satellite cells (S100α, glutamine synthase, excitatory amino acid transmitter 1, glial fibrillary acidic protein), the inward-rectifying potassium channel (Kir4.1), gap junctions (connexin 43), basement membranes (laminin-2), mitochondria (ATP synthase β-subunit [ATP5B] and frataxin), and monocytes (CD68, CD14, and IBA1). Reaction product of the cytoplasmic markers and laminin-2 confirmed proliferation of satellite cells into multiple perineuronal layers and residual nodules. Connexin 43-reactive gap junctions were greatly increased. The additional satellite cells displayed enhanced mitochondrial ATP5B but lacked frataxin fluorescence. DRG monocytes in FA cases were more abundant than normal, separated satellite cells from neurons, and participated in the formation of residual nodules. (Supported by NIH R01NS069454 and Friedreich's Ataxia Research Alliance).

Conflicts of Interest:

None.

Titles of Diagnostic Case Presentations

1. Neurocutaneous melanocytosis associated diffuse leptomeningeal melanocytosis

J. Ferreira

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2. Embolic catheter material; presumed cause of haemorrhage

Laura Davies, Lothar Resch

Department of Pathology and Laboratory Medicine, Division of Neuropathology, University of Calgary, Calgary, Alberta

3. Meningioangiomatosis

M.M. Abdulkader[1], J.L. Smith[2], C.Y. Ho[3], J.M.Bonnin[1]

[1]Division of Neuropathology, Department of Pathology and Laboratory Medicine; [2]Department of Neurosurgery and; [3]Department of Radiology and Imaging Sciences, James Whitcomb Riley Hospital for Children, Indiana University School of Medicine, Indianapolis, Indiana, USA

4. Hereditary Cerebral Hemorrhage With Amyloidosis-Dutch type (HCHWA-D)

N. Sinha[1], J.J.S. Shankar[2], S.E. Croul[3]

[1,3]Division of Anatomical Pathology; [2]Department of Neuroradiology, Queen Elizabeth II Health Sciences Centre and Dalhousie University, Halifax, Nova Scotia, Canada

5. IgG4-related perineurial disease

P. Diamandis[1], D.G. Munoz[2], S.P. Symons[3], N. Phan[4], J. Perry[5], M. Tsao[6], J. Keith[7]

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6. Graft versus host disease of the brain

Ana Nikolic[1], Launny Lowden[2], Lothar Resch[1]

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7. Myxopapillary ependymoma with anaplastic features

Y.A. Alwelaie[1,2], J.A. Maguire[1,2], K. Dorovini-Zis[1,2], F. Vice[2,4], M.C. Boyd[1,2], M.R. McKenzie[2,3], M.Z. Matishak[2,4], J. Shewchuk[1,2], G. Sidhu[2,4], G.R.W. Moore[1,2]

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8. Textiloma mimicking recurrent GBM

Claire I. Coiré[1], David G. Munoz[1], Loch Macdonald[2], James Perry[3]

[1]Divisions of Pathology and; [2]Neurosurgery, Saint Michael's Hospital, Toronto and; [3]Department of Medicine, Division of Neurology, Sunnybrook Health Science Centre, University of Toronto, Departments of Laboratory Medicine and Pathobiology

9. Epithelioid hemangioendothelioma

S. Jozaghi[1], S. Labonte[1], P. Gould[2]

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10. Amelanotic melanocytoma

Reena Baweja, Boleslaw Lach, Kesava Reddy

Department of Pathology and Molecular Medicine, and Neurosurgery, McMaster University, Hamilton, Ontario

11. Congenital spinal lipoma with divergent differentiation including skeletal muscle and primitive nephrogenic tissue suggestive of nephrogenic rest

Z. Al-Hajri[1], C. Dunham[2]