in temporal-occipital region were analyzed for identification of motor, speech and visual networks respectively.

Result: Regarding motor function, a strong positive correlation (r=0.65) between ipsilesional motor cortex activation and finger tapping performance was observed in non-paretic patients. Statistically significant differences in motor network activation was also found when paretic patients compared to non-paretic (p<0.01) and when ipsilesional motor network was compared to contralateral one (p<0.01). Regarding speech function, a strong positive correlation (r=0.75) between left inferior frontal gyrus activation and verbal fluency performance was observed in non-aphasic patients. Statistically significant differences in left inferior frontal gyrus activation was also found when aphasic patients were compared to non-aphasics (p<0.01). Regarding, finally, visual function, a statistically significant difference (p<0.01) was found between left and right lingual gyr imaging activation in patients with alexia-an inability to recognize letters.

Conclusion: To the best of our knowledge this is the first study to validate RS-fMRI motor, speech and visual networks in patients with brain tumors. RS-fMRI is a promising tool for identification of eloquent areas in tumor surgery.

Resting state fMRI, Presurgical planning, Neuropsychological evaluation

Pediatric emergencies

EPO:100
MAGNETIC RESONANCE FEATURES AND DIFFUSION TENSOR IMAGING EVALUATION STUDY OF NEONATAL HYPOXIC ISCHEMIC ENCEPHALOPATHY

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Purpose: To assess the features and myelination of the white matter tracts using MR and diffusion tensor imaging (DTI) in infants with hypoxic ischemic encephalopathy (HIE).

Methods: Brain MRI with structural DTI were performed on 37 HIE infants at birth, 3 months and 12 months, Measurement of fractional anisotropy (FA) and mean diffusivity (MD) on selected tracts and compared to age matched neurodevelopmentally healthy subjects. A total of 16 tracts were assessed: CST: corticospinal tract, ML: medial lemniscus, ICP: inferior cerebellar peduncle, MCP: middle cerebellar peduncle, SCP: superior cerebellar peduncle, SCR: superior corona radiate, ALIC: anterior limb of the internal capsule, PLIC: posterior limb of the internal capsule, PPR: posterior thalamic radiation(optic radiation), CC: corpus callosum, FX: fornix, UNC: uncinate fasciculus, SOFO: superior fronto-occipital fasciculus, SLF: superior longitudinal fasciculus, GCC: genu of the corpus callosum, SCC: splenium of the corpus callosum.

Result: Basal ganglia injury was seen in 67% of severe HIE group, 8% in the moderate HIE group and none in the mild HIE group. Delayed myelination at PLIC, SCR and OR were detected on conventional MRI at birth in all grades of HIE. Comparison of HIE with healthy subject showed a significant lower mean FA values at birth, in the mild group (n=4), affecting the PLIC (P = 0.002), OR (P = 0.0006) and SOFO (P = 0.0022) tracts; moderate group (n=16), affecting the PLIC (P = 0.000), OR (P = 0.000) and SOFO (P = 0.000) tracts; severe group (n=5), affecting the PLIC (P = 0.016), SOFO (P = 0.006) and OR (P = 0.007) tracts. MD values did not show comparable statistically significant change. PLIC showed statistically significant FA values between the mild and severe HIE group (P = 0.007) and moderate to severe HIE (P = 0.022).

Conclusion: DTI is able to detect delayed myelination in all grades at the PLIC, FX, SOFO and OR at birth. The PLIC is the only tract that demonstrate a decreasing trend in FA which showed statistical significance from mild to severe and from moderate to severe.

hypoxic ischemic injury, diffusion tensor imaging, MRI

EPO:101
LEIGH SYNDROME – A RETROSPECTIVE DESCRIPTION WITH A FOCUSING ON MAGNETIC RESONANCE IMAGING

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Purpose: Leigh syndrome, infantile subacute necrotizing encephalomyelopathy, is a genetically heterogeneous, progressive neurodegenerative disease with characteristic bilateral symmetric lesions in basal ganglia and subcortical brain regions. Although many patients used to die without an etiologic diagnosis, mitochondrial energy metabolism deficiency can frequently be found.

Methods: The files of the patients diagnosed with Leigh syndrome during the last 25 years in Hospital Pediátrico de Coimbra were retrospectively reviewed, with particular emphasis on the brain imaging.

Result: Sixteen patients were included (10 males; 6 females). All presented in the first 3 years of life, (median age: 16 months), except a previously healthy boy who had a severe psychiatric crisis at the age of 17 years. The most common clinical features were hypotonia, pyramidal and extrapyramidal signs, respiratory rhythm abnormalities, ophthalmoplegia and psychomotor development delay. Diagnosis of a mitochondrial disease was achieved in 12 patients. It was based on molecular findings in 4 patients, 3 with a mtDNA mutation [8993T→G (2) and 14487T>C (1)] and the fourth with a SURF1 mutation (c.868_869insT) and a deletion in heterozygosis. In the others, a severe enzymatic deficiency was found: respiratory chain complex IV (4), complexes I and IV (1) and pyruvate dehydrogenase complex (1), but the molecular studies have so far been inconclusive. Evolution was severe in most patients, with 30% of them deceased in 45 months (7-180) due to brainstem involvement.

In two children, CT scan was the only brain imaging available. MRI and proton spectroscopy were performed in 14 patients. T2-weighted spin echo hyperintense lesions were found in the basal ganglia of 86% (symmetric in 60%) and in the brainstem of 64% of the cases. In 5 patients there were lesions in the white-matter, supratentorial (3) or infratentorial (2). The involvement of the subthalamic nucleus was found in the SURF1 deficient patient. Lactate peaks in the basal ganglia were found in 5 cases. The prognosis was more severe in those patients with brainstem lesions.

Conclusion: Our data contributes to the knowledge of Leigh syndrome in our population. As expected, brainstem lesions in the MRI studies correlate with a poor prognosis.

Leigh, mitochondrial, SURF 1

EPO:102
PAEDIATRIC STROKE: A REVIEW OF THE IMAGING

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Purpose: Stroke is relatively rare in the paediatric population with a spectrum of aetioologies that differs from the adult population. Therefore, there can often be delay in diagnosis, leading to poor outcomes. The aim of this presentation is to provide a comprehensive review of the imaging features of paediatric strokes of varying aetiologies.