180

IMPAIRED NEURODEVELOPMENTAL OUTCOME ASSOCIATED WITH INCREASED WHITE MATTER CHO/CR IN PRETERM INFANTS

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Background: Diffuse white matter (WM) injury is the commonest MR finding in preterm infants. We aimed to describe the metabolic signature of diffuse WM injury and correlate to neurodevelopmental outcome at 1 year.

Methods: 45 preterm infants (< 32 weeks) underwent single WM voxel point-resolved spectroscopy (fig1A&B) at mean corrected gestational age (CGA) of 40±1.6 weeks. Metabolite ratios were quantified using AMARES algorithm. Bayley III was performed at a corrected age of 1 year. Infants with scores < -1SD in each domain classified as impaired.

Results: Only Naa/Cho correlated to gestation at birth (r=0.39 p< 0.05). 1 year outcome data was available for 42/45. Mean cognitive (96±14) and motor (87±15) composite scores were within the normative population range. Motor outcomes significantly correlated with both Naa/Cho and Cho/Cr ratios before and after correction for gestational age (table 1). After excluding babies with brain abnormalities, there was a significant increase in Cho/Cr in the motor impaired group (p< 0.05) (fig1C).

Conclusions: Localised white matter proton MRS Cho/Cr at term corrected age may provide a useful biomarker of motor outcome in preterm infants.

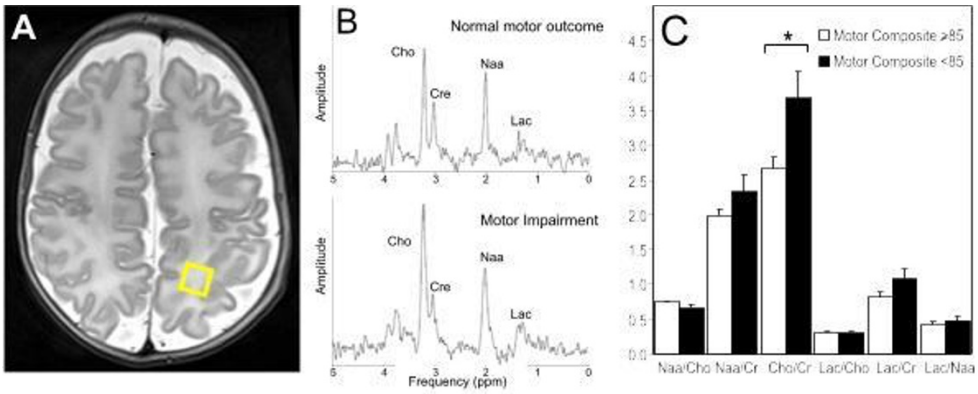

Figure 1: (A) The MRS voxel positioned in left PWM on an axial image. (B) Representative 1H spectra from babies with and without motor impairment. (C) Metabolite ratios in babies with and without motor impairment at 1 year corrected PN age.

[Figure1]

	Raw Correlation			Corrected for Gestational Age		
	Gross Motor	Fine Motor	Composite	Gross Motor	Fine Motor	Composite
Naa/Cho	r=0.44, p=0.004	r=0.41, p=0.007	r=0.47, p=0.002	r=0.38, p=0.015	r=0.32, p=0.041	r=0.39, p=0.011
Cho/Cre	r=0.49, p=0.002	r=0.32, p=0.040	r=0.41, p=0.007	r=0.42, p=0.007	r=0.24, p=0.124	r=0.349, p=0.026

[Table1]