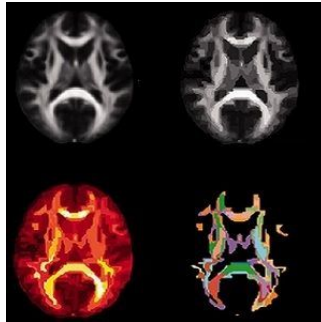## MRI Predicts Cognitive Outcome in Preterm Children

A study published in the neurology journal *Brain* suggests that children born prematurely are more likely to have low mathematical achievement at school age, which may be caused by reduced working memory and number skills. The study aimed to examine the use of magnetic resonance imaging (MRI) after birth to identify infants at risk of later academic impairment. According to the results, neonatal MRI is a useful method of predicting cognitive outcome in preterm children.

Researchers say that early identification of preterm children at risk for future impairment using brain markers would assist clinicians in directing families to targeted early intervention. For this study, the researchers assessed up to 224 preterm children at age five and age seven using MRI. The study participants are from Melbourne, Australia and are part of a Murdoch Children's Research Institute study.

The investigators were looking for associations between diffusion MRI and local brain volumes on neonatal MRI with number skills and working memory in childhood. They found that neonatal brain microstructure was positively associated with working memory scores in childhood. In addition, increasing tissue volumes in the left insula and putamen regions of the neonatal Jacobian map were positively associated with higher number skills scores in childhood.

"Our findings demonstrate that brain microstructure and increased tissue volumes in regions located around the insula and putamen during the neonatal period are associated with better early mathematics in preterm children," says the study's co-author Henrik Ullman, who is affiliated with the Department of Neuroscience, Karolinska Institutet, Stockholm, Sweden.

Co-author Megan Spencer-Smith, also from Karolinska Institutet, adds, "This knowledge could assist in identifying infants at risk of mild academic impairments who would benefit from monitoring and referral to early intervention. Such an approach could assist in reducing the number of preterm children performing below their peers in mathematics."

This research also suggests that identifying these children early could reduce behavioural and emotional problems in childhood, as well as reducing wellbeing and mental health problems in adulthood.

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