MEDIA RELEASE

New technology offers new hope for children with drug-resistant epilepsy

Monday 13 February 2017

- New research has found subtle epileptic brain abnormalities on MRI scans can be automatically detected in children.
- Young Epilepsy hails research as 'hugely significant' for paediatric neurology.
- These brain abnormalities can be difficult for trained radiologists to see.
- This advance could lead to more children with drug-resistant epilepsy being offered the option of surgery

A major cause of epilepsy in children is Focal Cortical Dysplasia, where an area of the brain has formed abnormally. These abnormalities are small and subtle and therefore notoriously difficult to accurately visualise on MRI. They are often missed on normal MRI scans and are especially difficult to spot in children as their brains are still rapidly developing.

Research conducted collaboratively by Young Epilepsy, UCL Great Ormond Street Institute of Child Health and the University of Cambridge, has been developing more accurate imaging techniques to identify these abnormalities in children.

A paediatric neuroradiologist identified these subtle abnormalities in all patients included in our study. The team then calculated a range of features from 3D reconstructions of the patient's brains, such as the thickness and folding of the brain as well as the intensity of the MRI scan. These features were used to train a computer to identify abnormal brain tissue.

The computer classifier was correctly able to identify the brain abnormality in 73% of patients. Importantly, the algorithm can be applied to new patients to help radiologists identify abnormalities in difficult cases.

Sophie Adler, who conducted the research at UCL GOS Institute of Child Health, says:

"Our computerised classifier was able to correctly detect the epileptic abnormalities in 73 percent of the patients. It even worked in the very young patients. This shows great technological progress and now we're planning to go one step further by testing the

programme on new patients with abnormalities that the neuroradiologist can't currently identify. The hope is that more children with drug-resistant epilepsy will be able to be considered for epilepsy surgery, and the surgery itself will have greater accuracy and therefore higher chances of freedom from seizures."

Professor Helen Cross, the Prince of Wales's Chair of Childhood Epilepsy, says:

"This work will significantly contribute to determining further children with drug resistant epilepsy who may be suitable for resective surgery and consequent cure of their epilepsy."

Rosemarie Pardington, the Director of Integrated Care for Young Epilepsy, says:

"This research is hugely significant for the field of paediatric neurology. More young people could now receive a life-changing opportunity to spend their adulthoods without epilepsy. Young Epilepsy's research partnership with Great Ormond Street Hospital and UCL GOS Institute of Child Health works to deliver ground-breaking results like this, to continually improve support, treatment and outcomes for children and young people with epilepsy."

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NOTES TO EDITORS:

Link to Research:
http://doi.org/10.1016/j.nicl.2016.12.030

About Young Epilepsy:

Young Epilepsy is the national charity working exclusively on behalf of children and young people with epilepsy. With 120 years of experience we are a leading provider of specialist health and education services. The charity offers support, information, and training for health, social care and education professionals and campaigns to improve access to, and quality of, health and education services.

Epilepsy is the most common serious neurological condition in childhood affecting 112,000 people aged 25 and under in the UK. On average one child at every primary school and five at every secondary school will have been diagnosed with epilepsy.

For more information on research at Young Epilepsy, visit youngepilepsy.org.uk/research.

If you need support or information, please contact our helpline on 01342 831342 or email helpline@youngepilepsy.org.uk. For further information on Young Epilepsy, please visit: www.youngepilepsy.org.uk

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