

Investigation of speech motor control and fine motor control in children with autism

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Poster Abstract

Background

Fine motor control is frequently impaired in children with autism, however, speech motor control has been found to be unimpaired in some studies using perceptual methods. This is despite the need for intricate movement of the tongue required for accurate speech. However, a small number of studies found residual and non-developmental speech errors are significantly higher in a sample of children with autism (33-40%) than the normal adult population (1-2%; Shriberg et al., 2001; Cleland et al., 2010). Conflicting evidence may be due to unreliable perceptual analysis that relies on auditory skills of the assessor. The cause of these speech errors is still in debate.

Aim of the study

Our research will investigate speech errors in autism using Ultrasound Tongue Imaging (UTI). It will be used to identify any inaccurate or uncoordinated movements of the tongue which could indicate a motor impairment. We aim to determine whether errors in fine motor control are echoed in errors of speech. Using UTI eliminates the higher likelihood of variation and inaccuracy of perceptual assessments. Additionally we will compare UTI and perceptual assessments to determine whether there are speech errors missed in clinic through use of perceptual assessment only.

Methods

We will compare UTI data with standardized speech assessments. UTI is used in the imaging of speech as it allows investigation of tongue movement. By placing a standard medical ultrasound probe under the chin, most of the surface of the tongue in a midsagittal view is imaged. UTI has been used in the field for decades however until recently it was hard to gain useful data from. Now ultrasound is portable, provides fast frame rates and can synchronize ultrasound images with audio. This allows analysis of tongue movement that can be compared across participants. Fine motor control will be assessed using standardized assessment and specific fine motor measurements. All assessments will analyse the coordination and accuracy of movements of fingers and speech muscles.

Conclusions/importance of work

It is important to investigate the relationship between speech motor control and fine motor control as it can ultimately change the treatment provided by speech and language therapists (SLTs). If speech errors in autism are a result of a motor control difficulty then traditional speech therapy is less likely to be successful. Therapy needs to specifically target speech motor planning. If perceptual assessments are not sensitive enough to identify speech errors in autism, UTI may be an effective instrument to improve diagnostic accuracy to inform practice.