Limited evidence on interventions to improve executive functions in children affected by prenatal alcohol exposure

This review found limited evidence for the effectiveness of interventions designed to improve executive functioning (EF) in children with prenatal alcohol exposure (PAE). Promising results were found only for response inhibition (the ability to inhibit prepotent responses, preferencing more goal-directed action). However, the ability to detect overall effects is severely limited by a lack of large comparison studies in the area.

What is this review about?
Fetal Alcohol Spectrum Disorder (FASD) is a preventable, life-long disability which poses significant cost to individuals, families and societies. Despite growing evidence exploring the profile of FASD, evidence on effective treatments of the condition is sparse.

Given prevalence estimates of around 5% of the general population, and higher in vulnerable samples, rigorous and comprehensive assessments of feasible interventions for FASD are a necessity.

The focus of this review is studies which assess the impact of psychological interventions designed to improve EF in children impacted by PAE. Eligible outcomes include any measure of EF as per contemporary popular models of the construct (discussed in detail in methodology section of the systematic review). Examples include: attention, working memory, cognitive flexibility, inhibition, planning, and organisation.

What studies are included?
Eleven studies are included, with only seven high-quality randomised or quasi-experimental studies, and four single group pre-post intervention studies. The randomised and quasi-experimental studies are synthesised using meta-analysis. Of these seven studies, all were carried out in either Canada or the USA.

What are the main findings of this review?
Overall, the studies have important methodological weaknesses that temper the review findings, most notably very small sample sizes or incomplete reporting.

The findings of this review illustrate the need for a greater number of high quality comparison studies with larger sample sizes.
While the pattern of results arising from the synthesis generally suggest positive intervention effects, the analyses did not reach statistical significance, aside from response inhibition. Response inhibition is the ability to inhibit behavioural responses in favour of goal-relevant behaviour, and this review found a medium-sized effect for children with PAE who participate in an EF-focused intervention compared to children who do not.

There appear to be no statistically significant differences between children with PAE who participated in EF interventions versus those who did not on the following direct measures of EF: auditory attention, visual attention, cognitive flexibility, attentional inhibition, verbal working memory or planning.

Similarly, there appear to be no statistically significant differences between children with PAE who participated in EF interventions versus those who did not on the following indirect measures of EF: global executive function, behavioural regulation, emotional control, shifting or inhibition.

What do the findings of the review mean?

Only a small number of eligible comparison group studies are included in the present analyses (n = 7), and it is likely that relatively small sample sizes hinder detection of effects across outcomes.

The findings of this review therefore illustrate the need for a greater number of high quality comparison studies with larger sample sizes. This will allow for more definitive conclusions to be drawn regarding the overall effectiveness of interventions for EF in children with FASD.