Eye movements: a window to the brain of children with fetal alcohol spectrum disorder

In this paper we examined the accuracy and characteristics of eye movements in children with fetal alcohol spectrum disorder (FASD) and compared these to healthy, typically developing children. FASD may occur when a mother drinks alcohol during pregnancy, which can cause different types of brain injury and physical problems in the baby. Eye movements are a useful measure of brain function because the pathways in the brain that control what our eyes look at have been extensively studied and are well mapped out. Previous studies have found that children with FASD produce eye movements that are different from typically developing children. One objective of this study was to conduct a more in-depth analysis of these eye movement behaviours.

Children (aged 5-18 years) with FASD (n=71) and typically developing controls (n=113) performed an eye movement task in which they looked to a target when it appeared to the left or right of a dot in the center of a video screen. Eye movements were recorded remotely, and examined for differences between children with FASD and typically developing children. Accuracy (how close they were to the target) was significantly poorer in the FASD group, especially in males. This means that both males and females with FASD were less accurate when they looked to a target. In some trials the children with FASD were able to accurately look to the target so we did a separate analysis and looked at these eye movements. In this dataset, the females with FASD had slower eye movements, whereas the males with FASD did not differ from the control group. Additionally, the deceleration (slowing down) was also selectively decreased in the females with FASD.

These results support the idea that children with FASD have problems in eye movement control associated with specific brain structures. Moreover, prenatal alcohol exposure may have different effects depending on the sex of the child, with males and females showing different patterns of problems. The eye movement inaccuracies seen in children with FASD could negatively affect many activities of daily life. Activities such as sports, reading, typing, driving, and food preparation become increasingly difficult when eye movements are not accurate. Therefore, it is important to better characterize these problems to increase our understandings of the impact they have on children with FASD.

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