PRENATAL ALCOHOL EXPOSURE AND FACIAL SHAPE OF ONE-YEAR OLD CHILDREN: NO AMOUNT OF ALCOHOL IS WITHOUT CONSEQUENCE

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Background: Children with Fetal Alcohol Spectrum Disorder (FASD) can have a characteristic facial appearance in addition to neurodevelopmental impairment. We do not know if there is a gradient of effects on the face of children with prenatal alcohol exposure (PAE).

Method: This is an analysis of 3D craniofacial images of 415 one year-old Caucasian children with detailed, prospectively collected PAE data. Analysis involved objective, holistic craniofacial phenotyping applying partial least-square regression to dense-surface models of the facial images.

Results: We saw a significant association between craniofacial shape and PAE, whether exposure occurred only in trimester one, or throughout pregnancy. Regions of difference ($p < 0.05$) were concentrated around the mid-face, nose, lips and eyes. Directional visualisation showed these corresponded to general recession of the midface and superior displacement of the nose, especially the tip of the nose, indicating shortening of the nose and upturning of the nose tip. Significant differences existed between groups with no exposure and groups with low exposure in trimester one (forehead), moderate/high exposure in trimester one (eyes, midface, chin, parietal region) and binge level exposure in trimester one (chin).

Conclusion: PAE, even at low levels, can influence craniofacial development. The observed differences were subtle, but are typical of dysmorphic features often seen in children with FASD. Although facial development is complex and each person's face is unique, it is sensitive to some influences at critical stages of development. Our study shows that alcohol contributes to how the face is formed in the womb.