Abstract

Congenital Zika syndrome (CZS) is characterized by severe microcephaly that negatively impacts cognitive development. Yet, little is known about the relationship between microcephaly severity and sustained attention, a key component of cognitive abilities. Sustained attention can be measured behaviorally and physiologically, with heart rate-defined sustained attention (HRDSA) generally converging with behaviorally-defined sustained attention (BDSA; i.e., looking). We predicted that BDSA and HRDSA would be positively correlated in CZS while microcephaly severity would be negatively associated with sustained attention. Forty-two Brazilian children with CZS (40% male; age: 38–46 months) and varying degrees of microcephaly at birth (1.59–7.50 standard deviations below norms) watched an animated video while wearing a HR monitor. We assessed whether children were looking at the video (0: not looking; 1: looking); BDSA was quantified as the proportion of time spent looking at the video. To quantify HRDSA, we determined the proportion of time children’s HR was consistently decelerated from baseline HR of individual looking episodes. Participants varied substantially in BDSA ($M = .53, SD = .32, \text{range}: .00\text{–}.99$) and HRDSA ($M = .18, SD = .22, \text{range}: .00\text{–}.97$). As expected, BDSA was positively related to HRDSA ($r = .71, p < .001$). Contrary to predictions, microcephaly severity was neither associated with BDSA ($r = -.01, p = .961$) nor HRDSA ($r = .07, p = .657$). These findings suggest that HRDSA is a robust index of sustained attention in CZS regardless of microcephaly severity at birth, offering a complementary and efficient means for measuring and monitoring development of sustained attention beyond behavioral assessments.