Longitudinal effects of the COVID-19 pandemic on infant and toddler development: A retrospective cohort study

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Background/Introduction

The COVID-19 pandemic was a novel global public health event which resulted in an unprecedented accumulation of potential stressors for families with young children. The pandemic environment introduced several risk factors for adverse early child development, including: risks related to peri-natal infection, social disruption, economic hardship, food insecurity, reduced access to healthcare and supportive services, disrupted routines, and parental anxiety and depression. Furthermore, the societal response to the pandemic disrupted the psychosocial, economic, and educational environments in which young children live, learn, and grow. These disruptions may have lasting developmental consequences.

Methods

The study was a retrospective cohort study comparing three cohorts: 1) children born and turning two prior to the pandemic, 2) children born before and turning two during the pandemic, and 3) children born and turning two after the start of the pandemic. Study participants included children who were term infants and who had completed a 24-month well-child visit during the study period (March 2019 - December 2022). Child development milestones were assessed in the domains of communication, gross motor, fine motor, problem-solving and personal-social using the ASQ-3. The primary outcome was the 24-month ASQ-3 Communication score. Participant characteristics between cohorts were compared using analysis of variance (ANOVA). Multivariable logistic or linear regression compared differences between cohorts and were adjusted for child age at questionnaire completion, sex, and insurance type.

Results

Of 604 children, most were Hispanic/Latino (37%) or Black (26%) and on government-sponsored insurance (77%). Compared to pre-pandemic, pandemic children scored lower for Total ASQ-3 (250 vs 262, p=.03), Communication (45 vs 49, p=.02), and Personal-Social (49 vs 52, p=.03) and had higher odds of atypical scores for Fine Motor (2.2, 95% CI 1.2-4.2; p=.01), with males more likely to have atypical scores for Communication (2.2, 95% CI 1.2-4.0; p=.03) and Fine Motor (2.3, 95% CI 1.0-5.0; p=.04). For the transitional cohort, pandemic exposure was negatively associated with Total ASQ-3 (p=.048), Communication (p=.02), and Personal-Social (p=.03) as compared to pre-pandemic children.

Conclusions

Our findings suggest a negative association of the COVID-19 pandemic with early child development, especially for emerging language and social-emotional skills, with males likely affected more than females. These findings have important implications for the educational system. Additional developmental resources and early intervention support may be needed for pandemic-born children as they near school-age.

Keywords: child development, COVID-19, adverse childhood events, pandemic, pediatrics