

ASSESSMENT OF POSTNATAL SPINAL DEVELOPMENT AND GROWTH PATTERNS IN CHILDREN BORN TO MOTHERS WITH COVID-19 INFECTION**Tuychieva Fatima Gulamjonovna**

Tashkent State Medical University

Department of Anatomy, Histology and Pathological Anatomy

Abstract. This study evaluates postnatal spinal development and growth patterns in children born to mothers who experienced COVID-19 infection during pregnancy. The review focuses on potential morphological and functional changes in early childhood, emphasizing anthropometric indicators that reflect vertebral growth. Current literature is analyzed to determine possible associations between prenatal SARS-CoV-2 exposure and musculoskeletal development outcomes.

Keywords: COVID-19, pregnancy, spinal development, children, anthropometry, postnatal growth, vertebral column

Introduction. The COVID-19 pandemic has raised significant concerns regarding its effects on maternal and child health. Pregnant women infected with SARS-CoV-2 may experience systemic inflammation, hypoxia, and placental dysfunction, all of which can influence fetal development. The musculoskeletal system, particularly the spinal column, is highly sensitive to intrauterine environmental conditions.

The spine undergoes continuous development from the embryonic stage through early childhood. Any disturbance during prenatal or early postnatal periods may lead to altered growth trajectories, postural abnormalities, or delayed skeletal maturation.

Objective. To assess postnatal spinal development and growth patterns in children born to mothers with COVID-19 infection during pregnancy.

Materials and methods. A narrative literature review was conducted using scientific databases including PubMed, Scopus, and Web of Science. Studies published between 2020 and 2025 were analyzed. The review included observational studies, cohort studies, and systematic reviews focusing on neonatal outcomes and early childhood growth parameters. Anthropometric indicators such as body length, trunk length, body proportions, and growth velocity were evaluated as indirect markers of spinal development.

Results and discussion. Maternal COVID-19 infection is associated with a range of pathophysiological changes, including systemic inflammation, cytokine activation, endothelial dysfunction, and impaired placental perfusion. These factors may result in chronic fetal hypoxia and restricted nutrient delivery, which are critical determinants of fetal growth.

Evidence suggests that children born to mothers with COVID-19 infection may present with lower anthropometric parameters at birth, including reduced body weight and length. Some studies

also report variations in early growth velocity during infancy, indicating possible long-term effects on somatic development.

The spinal column, as the central axis of the musculoskeletal system, plays a key role in overall body proportions. Trunk length and segmental body ratios are considered important indirect indicators of vertebral growth. Disruptions in these parameters may reflect altered vertebral development, delayed ossification, or impaired formation of physiological spinal curvatures.

Postnatal growth is influenced not only by prenatal conditions but also by nutrition, physical activity, and environmental factors. Therefore, distinguishing the specific contribution of prenatal COVID-19 exposure remains challenging. However, the observed trends in available literature suggest a potential association between maternal infection and altered musculoskeletal development.

Although direct imaging data on spinal morphology in early childhood remain limited, anthropometric assessments provide valuable non-invasive tools for early screening of developmental abnormalities. Children with prenatal exposure to adverse intrauterine conditions may require long-term monitoring for postural disorders and skeletal growth deviations.

Conclusion. Postnatal spinal development in children born to mothers with COVID-19 infection may be influenced by prenatal exposure to inflammatory and hypoxic conditions. While current evidence remains limited, available data suggest potential alterations in anthropometric growth patterns that may indirectly reflect vertebral development. Further longitudinal studies are needed to clarify long-term musculoskeletal outcomes and to develop preventive and diagnostic strategies.

References

1. Allotey J. Et al. Clinical manifestations and maternal outcomes of COVID-19. *BMJ*. 2020.
2. Wastnedge E.A.N. et al. Pregnancy and COVID-19. *Physiological Reviews*. 2021.
3. Knight M. Et al. Characteristics of pregnant women with COVID-19. *BMJ*. 2020.
4. Shanes E.D. et al. Placental pathology in COVID-19. *Am J Clin Pathol*. 2020.
5. Smith V. Et al. Maternal and neonatal outcomes associated with COVID-19. *PLoS ONE*. 2020.
6. WHO. Clinical management of COVID-19. 2020.
7. CDC. COVID-19 and pregnancy guidance. 2022.