POST-VACCINATION IMMUNITY TO HEPATITIS B IN CHILDREN BORN TO MOTHERS WITH COVID-19: CLINICAL AND IMMUNOLOGICAL EVALUATION

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Background. Hepatitis B remains a major global health burden, with protective anti-HBs titers (≥10 mIU/mL) serving as the standard marker of vaccine-induced immunity [1]. Maternal SARS-CoV-2 infection during pregnancy may alter neonatal immune development, potentially compromising the efficacy of routine infant vaccination, including hepatitis B immunization. Data on this relationship remain scarce.

Aim. To evaluate clinico-immunological parameters in children born to mothers with COVID-19 in order to develop recommendations for assessing post-vaccination immunity to hepatitis B.

Materials and Methods. The study included 100 children aged up to 3 years: a main group (n=35) born to mothers with confirmed COVID-19; a comparison group (n=31) born to mothers with COVID-19 contact; and a control group (n=34) born to healthy mothers. Anti-HBs titers were measured by ELISA. Serum immunoglobulins (IgA, IgM, IgG), interferon-gamma, pro-inflammatory cytokines (IL-6, IL-8, TNF-α), liver transaminases (ALT, AST), CRP, total protein and urea were assessed. Pearson correlation analysis was applied.

Results. Children born to COVID-19–positive mothers showed morbidity in 74.3% of cases during the first three years of life, dominated by respiratory infections and pneumonia (53.8%) and perinatal CNS lesions (26.9%). Anti-HBs titers were significantly lower in the main group than in controls (0.088±0.02 vs 0.199±0.05 IU/L, $p<0.05$), indicating reduced vaccine efficacy. The main group also displayed reduced IgA and IgM, decreased interferon-gamma, elevated CRP and IgG, and markedly elevated IL-6 and IL-8 compared with controls ($p<0.05$), consistent with a secondary immunodeficiency state and subclinical hepatic dysfunction. This pattern aligns with reports that impaired innate immunity in children born to mothers affected by COVID-19 manifests as reduced phagocytic activity and low total immunoglobulin levels, reflecting either deficient humoral synthesis or excessive immune complex formation [2]. Correlation analysis revealed strong inverse associations between IgG and ALT (r=-0.50), AST (r=-0.52), and urea (r=-0.54), and a positive correlation between AST and IL-8 (r=0.65), identifying IgG and IL-8 as reliable indicators of vaccination efficacy.

Conclusion. Children born to mothers with COVID-19 demonstrate impaired post-vaccination hepatitis B immunity and an elevated risk of secondary

immunodeficiency. Serial monitoring of IgG, IL-8, ALT and AST during the first three years of life is recommended to enable early detection of immune dysfunction and individualized revaccination planning in this risk group.

REFERENCES:

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