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phosphorus and the normality of the rest of the bone markers, TH of infancy was suspected.

Repeating bone markers were recommended within 6-8 weeks, with evidence of normalisation of ALP and phosphorus.

A decision algorithm was generated, in which if ALP values are > 4 NV in children under 24 months, bone and liver profiles are automatically implemented. If both are normal, a comment to ALP is included: “possible TH, repeat in 6-8 weeks to check evolution”.

Such significant increments of ALP may cause alarm in the applicant doctor. The inclusion of this algorithm avoids the progression of unnecessary tests, as it is a benign pathology, closing the diagnosis in a single act.

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M278

Serological antibody response to SARS-COV-2 vaccination in a large cohort of Canadian children, adolescents, and adults

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Background-aim

Monitoring immune protection post-administration of an mRNA SARS-CoV-2 vaccine is essential to inform public health policy. The potential utility of quantitative antibody assays to indicate risk of breakthrough infection is of interest. Significant evidence gaps exist in our understanding of antibody response in children and adolescents relative to adults post-vaccination. The current study aims to evaluate age-specific differences in antibody response to SARS-CoV-2 vaccination in a large cohort of Canadian children, adolescents, and adults.

Methods

Quantitative serological antibody response following administration of one, two, or three doses of an mRNA SARS-CoV-2 vaccine were evaluated in a prospective cohort of 454 participants (age range: 6-79y, male: 34%, female: 66%). A subset of participants were longitudinally monitored during a five month period (Aug–Dec 2021). A control cohort of individuals with no history of SARS-CoV-2 infection or vaccination were evaluated to assess specificity. Antibody levels were measured using two immunoassays: DiaSorin LIAISON SARS-CoV-2 TrimericS IgG and Abbott AdviseDx SARS-CoV-2 IgG II assays.

Results

Antibody assay sensitivity in study participants post-second and third dose were 96% and 98%, respectively. Antibody titres varied significantly depending on days since vaccine administration. Participants post-third dose reached maximum titres of 25,000 BAU/mL and ten-fold relative increase in longitudinal cohort. A statistically significant difference was observed between pediatric (mean±SD = 2037±1515) and adult (1444±1277) antibody titres. A specificity of 98% was observed for participants with no history of SARS-CoV-2 infection or vaccination. A strong correlation between titres on the AdviseDx and TrimericS assays were observed (Pearson R: 0.92).

Conclusions

This is the largest evaluation of commercially available quantitative SARS-CoV-2 antibody assays in a cohort of Canadian children, adolescents, and adults. Findings suggest children have higher antibody titres as compared to adults post-administration of an mRNA vaccine. However, significant variation was observed. Future work is needed to relate antibody presence to functional immune response as well as risk of breakthrough infections.

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M279

Pediatric reference interval verification for special chemistry, immunoassay, and cancer markers on the Abbott Alinity CI system

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Background-aim

The Canadian Laboratory Initiative on Pediatric Reference Intervals (CALIPER) has developed an extensive database of reference intervals (RIs) for several biomarkers on various analytical systems, including special chemistry, immunoassay and cancer markers used to inform clinical decisions. In this study, pediatric RIs were verified for 13 assays on the Abbott Alinity system based on the analysis of samples collected from healthy children and adolescents (birth-18 years) and comparison to comprehensive RIs previously established for Abbott ARCHITECT assays.

Methods

Analytical performance of Alinity chemistry and immunoassays was first assessed through precision, linearity, and method comparison. Subsequently, 100 serum samples from healthy children recruited with informed consent were analyzed for 13 Alinity assays (i.e. cancer antigen 19-9, cancer embryonic antigen, C3, C4, cortisol, C-peptide, DHEA-S, glucose, immunoglobulin A, G, M, lactic acid, total prostate specific antigen). The percentage of test results falling within published CALIPER ARCHITECT reference and confidence limits was determined. Reference intervals were considered verified if ≥90% of laboratory test results fell within previously established confidence limits.

Results

All assays demonstrated acceptable performance on the Alinity ci system. Of 13 assays assessed, 12 met the criteria for verification with ≥95% of laboratory test results falling within previously established ARCHITECT limits for most assays. Several pediatric reference values were below the limit of detection for cancer markers (i.e. cancer embryonic antigen, cancer antigen 19-9, total prostate specific antigen). Only 54% of pediatric samples fell within the recommended Abbott ARCHITECT for lactic acid, and thus a new Alinity-specific reference interval is needed.

Conclusions

These data demonstrate marked concordance between ARCHITECT and Alinity systems for 13 assays, as well as the robustness of previously established CALIPER RIs in healthy children and adolescents. Expanding the utility of the CALIPER database (www.caliperdatabase.org) to include Alinity assays for special chemistry and cancer markers will assist clinical laboratories using this new platform and contribute to improved clinical decision-making in pediatric populations.

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