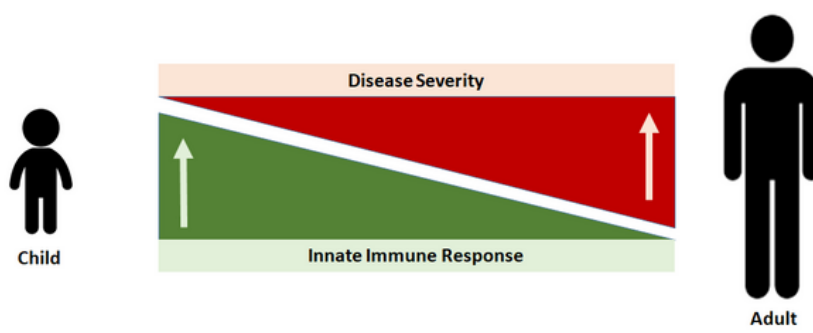


Natural mucosal barriers and COVID-19 in children

JCI Insight. 2021 Apr 6:148694

Background: COVID-19 is more benign in children compared to adults for unknown reasons. This contrasts with other respiratory viruses where disease manifestations are often more severe in children. This study hypothesized that a robust early innate immune response to SARS-CoV protects against severe disease.



COVID 19 – Innate Immune Response & Disease Severity

Methods: Clinical outcomes, SARS-CoV-2 viral copies and cellular gene expression were compared in nasopharyngeal swabs obtained at time of presentation from 12 children and 27 adults using bulk RNA sequencing and quantitative reverse transcription PCR. Total protein, cytokines and anti-SARS-CoV-2 IgG and IgA were quantified in nasal fluid.

ACADEMIC P.E.A.R.L.S

Pediatric Evidence And Research Learning Snippet



Are natural mucosal barriers more protective in children against COVID-19?

Results : SARS-CoV-2 copies, ACE2, TMPRSS2 gene expression were similar in children and adults. Children displayed higher expression of genes associated with interferon signaling, NLRP3 inflammasome, and other innate pathways. Higher levels of IFN- α 2, IFN- γ , IP-10, IL-8, and IL-1 β protein were detected in nasal fluid in children versus adults. Children also expressed higher levels of genes associated with immune cells whereas expression of those associated with epithelial cells did not differ in children versus adults. Anti-SARS-CoV-2 IgA and IgG were detected at similar levels in nasal fluid from both groups. None of the children required supplemental O₂, whereas 7 adults did ($p=0.03$); 4 died.

Conclusions: This data suggests that increased expression of genes that are markers of immune cells including B and T cell in nasopharyngeal swabs obtained from pediatric compared to adult patients is consistent with an enhanced immune response.

Key message: Although, the sample size is small, these findings provide direct evidence of a more vigorous early mucosal immune response in children compared to adults and suggest that this contributes to favorable clinical outcomes.

EXPERT COMMENT

“Innate response is more robust in children and its local activation probably provides increased degree of protection to children against SARS-CoV-2 as compared to adults. Therapies which enhance these pathways may therefore be an effective treatment strategy for protection against severe outcomes as suggested by ongoing trials of inhaled interferon beta-1 for early treatment of COVID-19.”

Dr Veena Raghunathan

MD ,DNB Pediatrics

FNB Pediatric Intensive Care

Senior Consultant, Pediatric Critical Care

Medanta, The Medicity, Gurugram

With warm regards,

**DR MANINDER S
DHALIWAL**

DR. PIYUSH GUPTA
IAP NATIONAL
PRESIDENT 2021

DR REMESH KUMAR R.
IAP PRESIDENT
2022

**DR BAKUL JAYANT
PAREKH**
IAP PRESIDENT
2020

**DR G.V.
BASAVARAJA**
HON. SECRETARY
GEN. 2021 - 22

Reference

Pierce CA, Sy S, Galen B, Goldstein DY, Orner EP, Keller MJ, Herold KC, Herold BC. Natural mucosal barriers and COVID-19 in children. JCI Insight. 2021 Apr 6:148694. doi: 10.1172/jci.insight.148694. Epub ahead of print. PMID: 33822777.