



# Is There a Link Between Hyperadiponectinemia in Newborns and a Better Prognosis in COVID-19 Infection?

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## Editorial

Adiponectin, also called ACRP (Adipocyte Collagen-like Related Protein), is produced from adipose tissue in humans and has anti-inflammatory and anti atherogenic properties. Plasma adiponectin concentrations have been shown to be decreased in male compared with female adults and in patients with obesity, Type 2 diabetes and cardiovascular disease [1], curiously the risk groups for COVID-19 infection. We previously reported an increase of adiponectin concentrations at delivery in comparison with the levels observed in healthy adults [2]. We also reported that adiponectin levels of normal healthy adults were higher than those of obese adults ( $12.2 \pm 1.2$  vs.  $7.1 \pm 1.3$   $\mu\text{g/mL}$ , respectively) [3]. Thus, cord blood adiponectin concentrations were 2 to 3 fold higher than those of healthy no obese adults [3]. The analysis of adipose tissue histology in newborns demonstrated the presence of small cells, that do not contain fat, and larger cells, that contain fat but are small in diameter compared with adult fat cells [4]. These cells are responsible for the increased adiponectin synthesis in neonates. The fall in adiponectin levels at one year of life maybe a consequence of the increase in adiposity; as in older children, where adiponectin levels negatively correlate with the percentage of body fat. It has also been reported that low plasma adiponectin concentrations are closely related to hyper insulinemia in children [5].

Hypoadiponectinemia is speculated to play a key role in the relationship between obesity and COVID-19 respiratory failure. However, at this moment, there is only one study, in adult population with acute respiratory failure that investigated the possible link of adiponectin levels and COVID-19 response. Kearns et al. [6] conclude that adiponectin levels are reduced in patients with COVID-19 respiratory failure, even after adjustment for multiple covariates. So we can speculate that serum adiponectin levels may have a protective effect during the cytokine storm of COVID-19 infection.

In addition, prognosis of neonates with SARS-CoV-2 infection was good, with all of the discharged alive after a median hospital stay of 10 days. Lu et al. [7] found that increased IL-6 and IL-10 in early SARS-CoV-2 infection in children are valuable indices for early diagnosis of severe disease. The significantly increased IL-6, IL-10, ferritin, procalcitonin, and SAA at this stage in children with critical COVID-19 may be closely associated with the systemic cytokine storm caused by immune dysregulation [8]. While median duration of hospital action was comparable among neonates, children and adults, literature data stress the different impact of the disease in neonates/children vs. adults who have worse prognosis. Many hypotheses have been suggested to explain this fact, including a lower ACE2 expression, the receptor that SARS-CoV-2 uses for host entry, less proinflammatory cytokine response, a stronger innate immune response and a higher proportion of total lymphocytes and absolute numbers of T and B cells [7]. We hypothesize that this less proinflammatory cytokine response is also related to neonatal hyperadiponectinemia. Future studies are needed to elucidate this important relationship between adiponectin levels and COVID-19 infection in the pediatric population.

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