

Overnutrition in Infants Is Associated With High Level of Leptin, Viral Coinfection and Increased Severity of Respiratory Infections: A Cross-Sectional Study

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Objective: To investigate the relationship of overnutrition (obese and overweight) with severity of illness in children hospitalized with acute lower respiratory infections (ALRIs), frequency of viral coinfections and leptin levels. **Methods:** We studied 124 children ≤ 2 years old that were hospitalized for ALRI. Nutritional status was calculated by z-scores according to weight-for-age z-scores, length or height-for-age z-scores, and weight-for-height z-scores. Nasopharyngeal aspirates (NPAs) were obtained and viral respiratory pathogens were identified using reverse transcription polymerase chain reactions (RT-PCR). Respiratory syncytial virus (RSV) load was assessed using quantitative RT-PCR. NPA and plasma leptin level were measured. Clinical data and nutritional status were recorded, and patients were followed up until hospital discharge. Viral coinfection was defined as the presence of two or more viruses detected in the same respiratory sample. Severity of illness was determined by length of hospitalization and duration of oxygen therapy. **Results:** Children with overnutrition showed a greater frequency of viral coinfection than those with normal weight (71% obese vs. 37% normal weight $p = 0.013$; 68% overweight vs. 37% normal weight $p = 0.004$). A lower RSV load was found in obese (5.91 \log_{10} copies/mL) and overweight children (6.49 \log_{10} copies/mL) compared to normal weight children (8.06 \log_{10} copies/mL; $p = 0.021$ in both cases). In multivariate analysis, obese, and overweight infants ≤ 6 months old were associated with longer hospital stays (RR = 1.68; CI: 1.30-2.15 and obese: RR =

1.68; CI: 1.01?2.71, respectively) as well as a greater duration of oxygen therapy (RR = 1.80; IC: 1.41?2.29 and obese: RR = 1.91; CI: 1.15?3.15, respectively). Obese children <6 months showed higher plasma leptin level than normal weight children (7.58 vs. 5.12 ng/?l; p <0.046).

Conclusions: In infants younger than 6 months, overnutrition condition was related to increased severity of infections and high plasma leptin level. Also, children with overnutrition showed a greater frequency of viral coinfection and low RSV viral load compared to normal weights children. These findings further contribute to the already existent evidence supporting the importance of overnutrition prevention in pediatric populations. © Copyright © 2020 Arias-Bravo, Valderrama, Inostroza, Reyes-Farías, Garcia-Diaz, Zorondo-Rodríguez and Fuenzalida.

children

leptin

overnutrition

severity

viral coinfection

viral respiratory infection

leptin

vaccine

Article

assisted ventilation

breast feeding

bronchiolitis

bronchitis

child

child hospitalization

childhood obesity

controlled study

cross-sectional study

disease severity

female

hormone blood level

hospital discharge

human

Human respiratory syncytial virus

infant

length of stay

lower respiratory tract infection

major clinical study

male

mixed infection

nasopharyngeal aspiration

nutritional status

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reverse transcription polymerase chain reaction

treatment duration

vaccination

virus infection

virus load