Low-grade systemic inflammation in overweight children: impact of physical fitness.

Abstract: Obesity as well as low physical fitness and inactivity are associated with an increased incidence of cardiovascular risk factors and coronary artery disease (CAD). Increased inflammation has recently been addressed to play an important role for the relationship between obesity and CAD, as adipose tissue expresses and releases pro-inflammatory cytokines such as interleukin-6 (IL-6) and tumor necrosis factor-alpha (TNF-alpha). As this relationship is less clear in childhood, we investigated 197 children aged 10-15 years assessing obesity, physical fitness, and a metabolic cardiovascular risk profile including markers of inflammation. Obese children had significantly higher concentrations of inflammatory parameters such as fibrinogen, ferritin, IL-6, and TNF-alpha than non-obese subjects ($P \leq 0.05$) and fitness ($\geq 5$ MET), we found that obese, unfit children showed the highest systemic inflammation, whereas fit but obese individuals had as low levels as lean and fit children. These data reveal that even in childhood inflammatory parameters are elevated in obesity and that physical fitness counteracts this association.