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Title: Association of early life growth rates with childhood wheezing and overweight

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Body: Background An association between childhood wheezing and overweight has been proposed, but the underlying mechanism remains unclear. It has been suggested that growth rates in early life are related to both the development of overweight and wheezing. Aim To investigate whether growth rates are independently related to both wheezing and overweight until age 3 years. Methods Children from the Lucki Birth Cohort Study with complete follow-up for questionnaires and measured height and weight (at ages 0, 7, 14 months and 3 years) were included (N=566). Wheezing was parentally reported. Overweight was defined as BMI above the 85th percentile. Growth rates were calculated for weight, height and BMI as the difference between z-scores at successive measurements. We performed logistic Generalised Estimating Equations analyses. Results A higher height growth rate was associated with lower risk of wheezing until age 3 years (adjusted (a)OR: 0.65 (0.53-0.79)), but not with overweight (aOR: 1.1 (0.9-1.3)). Higher weight growth rate and higher BMI growth rate were associated with overweight until 3 years (aOR: 2.3 (2.0-2.7) and aOR: 2.5 (2.1-2.9), respectively), but not with wheezing. The association of height growth rate with wheezing did not change after including overweight in the models. Conclusion Reduced height growth was associated with wheezing until age 3 years, independent from overweight. Increased weight growth and increased BMI growth were associated with overweight, but not with wheezing. These results indicate that early life growth rates do not explain an association between wheezing and overweight. Future analyses should clarify the direction of the association between height growth and wheezing.