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Growth analysis in children aged 6 to 11 years with severe atopic dermatitis and impact of 16 weeks of dupilumab treatment on height

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Introduction & Objectives: In a 2007-2008 assessment of atopic dermatitis (AD) severity and height, adolescents with moderate and severe AD were found to have significantly higher odds of height <25th percentile of the CDC growth reference chart.1 Children with AD and in the ≤25th height percentile are at higher risk of low bone mineral density and low alkaline phosphatase (ALP).2 AD development was also associated with an increased risk of subsequent fracture.3 The mechanisms underlying this phenomenon are unclear and may relate to chronically poor sleep associated with AD, use of oral and topical glucocorticoids and the effects of a prolonged inflammatory state.1 Dupilumab vs placebo was shown to significantly increase levels of bone ALP in serum from children aged 6–11 years with moderate-to-severe AD enrolled in a phase 3 + OLE trial.4 We report the proportion of children 6–11 years with severe AD and lower stature who reach a ≥5 percentile improvement in height in 16 weeks compared with children in the placebo group, following treatment with dupilumab.

Materials & Methods: Height and weight for children aged 6–11 years with severe AD (NCT03345914) were collected. Data were analyzed by gender and stratified per proportion of patients above and below the 50th percentile of CDC growth reference charts for height, weight and BMI at baseline. Proportion of patients with change from baseline in height percentile ≥5 (patients below the 25th, 30th, 40th and 50th height percentiles at baseline) were reported at Week 16.

Results: Girls aged 6−11 years (n = 153) with severe AD were overrepresented below the 50th percentile in height by 4.2%; boys (n = 151) by 7.6%. In contrast, children with AD were overrepresented above the 50th percentile for weight (5.6% in girls and 7.6% in boys) and BMI (17.3% in girls; 12.9% in boys). A significantly greater proportion of children below the 25th, 30th or 40th percentiles at baseline achieved a ≥5 percentile improvement in height when treated with dupilumab compared with placebo [<25th percentile: 11.9% placebo (n = 42) vs 30.6% dupilumab (n = 62), P = 0.0329; <30th percentile: 11.1% placebo (n = 45) vs 31.9% dupilumab (n = 69), P = 0.0129; <40th percentile: 15.5% placebo (n = 58) vs 31.3% dupilumab (n = 83), P = 0.0467]. A difference in the proportion of children achieving ≥5 percentile improvement in height was observed in patients <50th percentile at baseline, but it was no longer significant [<50th percentile: 15.7% placebo (n = 70) vs 29% dupilumab (n = 100), P = 0.0653].

Conclusion: These data from a rigorously selected population for phase 3 evaluation support the body of real-world evidence indicating that severe AD during childhood carries a risk of lower stature, as well as higher weight and BMI compared with healthy reference standards. Prompt and effective management of AD with dupilumab in younger children may have lifelong benefit in those who are below expected height by improving vertical growth.

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