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Study Finds rhGH Has No Negative Effects on Sleep-Breathing Disorders

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| Publish Date January 24, 2024

In children with Prader-Willi syndrome (PWS) who are younger than 3 years old, recombinant human growth hormone (rhGH) exhibits no detrimental effects on sleep-related breathing disorders, according to findings from a 1-year retrospective cohort study published in the journal *BMC Pediatrics*.

In infancy, individuals with PWS experience neonatal hypotonia, low birth weight, difficulty feeding, and endocrine disorders. To date, no known cure exists for the disorder. Use of an integrated, multidisciplinary strategy, including treatment with synthetic rhGH, occupational therapy, and developmental therapy, is recommended to improve patient quality of life, minimize disease complications, and maximize life expectancy.

In the PWS population, rhGH therapy is used to improve short stature and metabolism; however, the impact of this treatment on breathing and sleep parameters remains to be elucidated. The researchers of the current study sought to explore the effects of rhGH therapy on sleep-related breathing disorders in toddlers with PWS.

Participants were divided into 1 of 2 groups: the rhGH treatment group and the non-rhGH treatment group (controls). Those in the rhGH group previously had been enrolled in a prospective clinical trial (NCT03554031). Following their diagnosis with PWS, those in the rhGH group were treated at the department of endocrinology at the Children's Hospital of Fudan University, Shanghai, China. Between October 2018 and January 2023, 34 patients younger than 3 years of age were enrolled in the study—17 in the rhGH arm (8 males, 9 females) and 17 in the control arm (7 males, 10 females). All participants in the rhGH treatment group received rhGH therapy for 52 weeks.

The mean patient age in the rhGH arm was 20.76±9.22 months; the mean age in the non-rhGH arm was 25.23± 13.81 months. In all study participants, data associated with polysomnography-

polygraphy, insulin-like growth factor 1 (IGF-1) serum levels, and insulin-like growth factor binding protein 3 (IGFBP-3) serum concentrations were obtained.

Genetic results of the study demonstrated that paternal 15q11-13 deletions were reported in 70.59% (24 of 34) of the participants and aberrant methylation (maternal uniparental disomy and imprinting defect) in 29.41% (10 of 34). Of the 17 patients in the rhGH group, 76.47% (13 of 17) exhibited paternal 15q11-13 deletions and 23.53% (4 of 17) of them had aberrant methylation. In the control group, in contrast, 64.71% (11 of 17) of the individuals exhibited paternal deletions and 35.29% (6 of 17) had aberrant methylation. No significant differences in genetic findings were reported between the rhGH and the control groups.

IGF-1z-scores increased significantly in the rhGH arm vs the non-rhGH arm (1.74±1.75 vs −0.46±0.68, respectively; P <.001), as were IGFBP levels (3.56±1.24 vs 2.17±1.09, respectively; P =.02). The increased IGF-1z-scores and IGFBP levels did not worsen participants' sleep-related breathing disorders.

Treatment with rhGH in toddlers was not associated with any adverse effects on obstructive apnea-hypopnea index, central apnea index, oxygen desaturation index, mean percutaneous oxygen saturation (SpO_2), lowest SpO_2, duration of SpO_2 when less than 90%, and percentage of participants with SpO_2 less than 90%—all of which were between the 2 arms.

According to the authors, "The present study sheds more light on the clinical practice of rhGH treatment for patients with PWS."

Reference

Guo H, Fu J, Zhou Y, Luo F, Cheng R. Evaluating the effect of recombinant human growth hormone treatment on sleep-related breathing disorders in toddlers with Prader–Willi syndrome: a one-year retrospective cohort study. *BMC Pediatr*. Published online January 10, 2024. doi:10.1186/s12887-023-04513-0