

# Effect of Human Growth Hormone on Growth Rate of Short Stature Children with Low Birth Weight

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## Abstract

**Background:** If children with intrauterine growth retardation (IUGR) are stunted after birth, they will not have the desired height. Short stature is not fatal but affects personality and social and physical development of children.

**Objective and hypotheses:** The aim of this study was to determine the effect of human GH on growth rate of short stature children with history of low birth weight.

**Methods:** This study was conducted on 148 children (3 – 13 years old), 106 girls and 42 boys, with diagnosis of IUGR and a height SD score of  $-2$  SD or less in Qazvin, Iran. Parents' height was in the normal range for adults. Other causes of short stature were ruled out. The study subjects were treated with 4 IU/m<sup>2</sup> per day GH for at least 6 months. Height growth rate was measured and compared before and after the treatment.

**Results:** At the start of the study mean age was  $8.73 \pm 2.84$  year. Height growth rate was  $0.41 \pm 0.17$  and  $0.87 \pm 0.23$  cm/month before and after the treatment, respectively and the difference was statistically significant ( $P < 0.001$ ). Height SD score was significantly decreased. Furthermore, the results of boys and girls were not statistically different.

**Conclusion:** GH therapy can improve height growth status in children with low birth weight.

## Objectives

Intrauterine growth retardation (IUGR) is an important cause of small stature in children presenting to pediatric endocrinologists. Some catch-up growth of children with IUGR has been observed in about 70% of all cases during the first year of life. Previous longitudinal studies have shown a significantly reduced adult height with a five- to seven-fold higher risk of short stature among adults who were born small for gestational age. Since in most children with IUGR adult heights to be expected are below the population range, growth hormone (GH) treatment has been tried for many years, but the data available from the literature are not encouraging to date and need to be re-evaluated in controlled long-term trials. The aim of this study was to determine the effect of human GH on growth rate of short stature children with history of low birth weight.

## Methods

This study was conducted on 148 children (3 – 13 years old), 106 girls and 42 boys, with diagnosis of IUGR and a height SD score of  $-2$  SD or less in Qazvin, Iran. Parents' height was in the normal range for adults. Other causes of short stature were ruled out. All children were evaluated at baseline and were observed for six month to record growth rate. Then, the study subjects were treated with 4 IU/m<sup>2</sup> per day GH for at least 6 months. Height growth rate was measured and compared before and after the treatment.

## Results

At the start of the study mean age was  $8.73 \pm 2.84$  year. Height growth rate was  $0.41 \pm 0.17$  and  $0.87 \pm 0.23$  cm/month before and after the treatment, respectively and the difference was statistically significant ( $P < 0.001$ ). Height SD score was significantly decreased. Furthermore, the results of boys and girls were not statistically different.

Figure 1. Growth rate before treatment

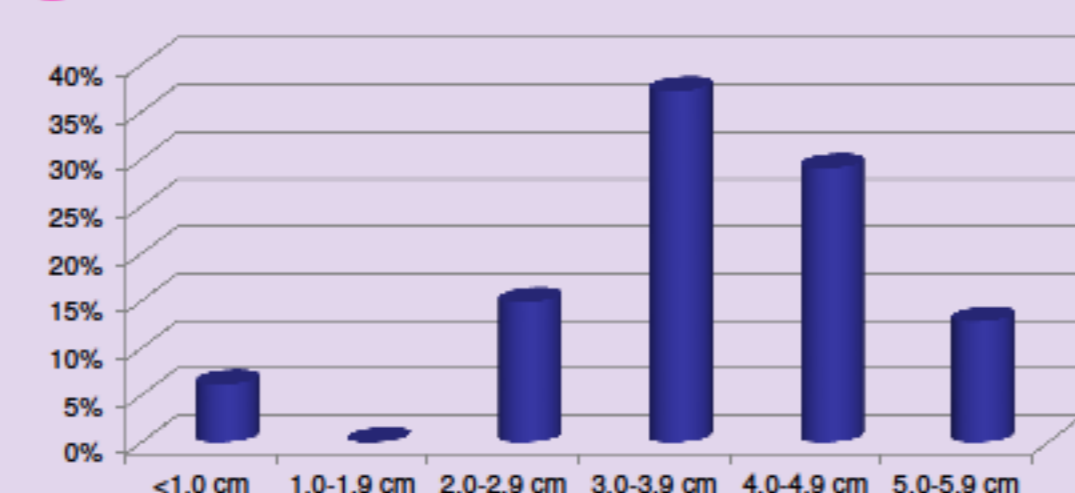
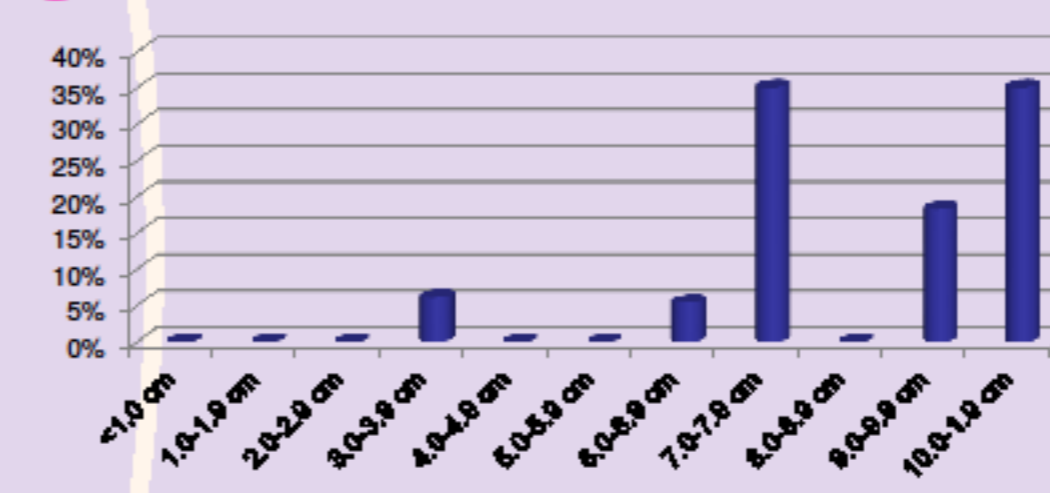


Figure 2. Growth rate after treatment



## Conclusions

In spite of an extremely heterogeneous etiology there is relatively little variability in the postnatal growth patterns of children with IUGR. Most of the children show a certain degree of catch-up growth during the first 6 months of life, but rarely reach the final adult height of their normal birth weight peers. GH therapy can improve height growth status in children with low birth weight. However, long-term observations will be needed to decide whether or not the gain in height will exceed the detrimental effect on bone maturation.

## References

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