Oxford University Hospitals NHS
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Growth velocity in children with sickle cell disease is increased or maintained whilst taking Hydroxycarbamide

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Introduction

Several studies have shown decreased growth velocity in children with sickle cell disease. Suboptimal growth velocity has also been correlated with decreased haemoglobin concentration.[1]

Some studies have demonstrated no difference in height velocity in peripubertal patients with sickle cell disease on hydroxycarbamide compared with no therapy[2] .

There is limited data on the impact of hydroxycarbamide in growth. Due to the effect of the increase in haemoglobin, it is possible that hydroxycarbamide can increase growth velocity.

Methods

We present the data of 32 children with sickle cell disease on hydroxycarbamide

Height (cm) and weight (Kg) and centile were recorded in patients pre and post hydroxycarbamide.

Post hydroxycarbamide, we collected data at 6 months, 1 year and last recorded.

Haemoglobin levels and Haemoglobin F % were also documented at these time points.

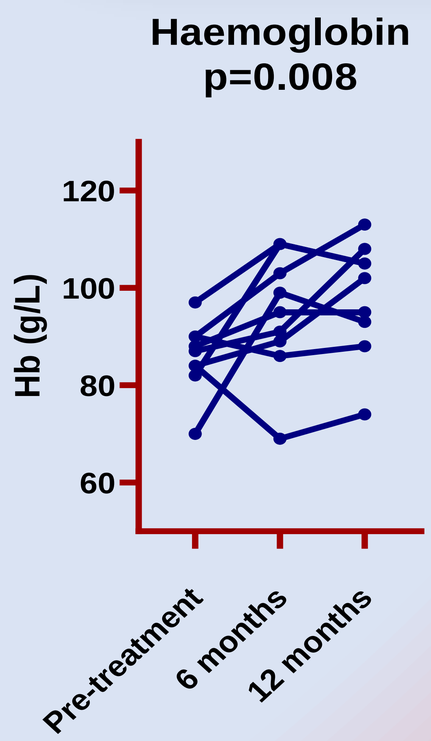
Results

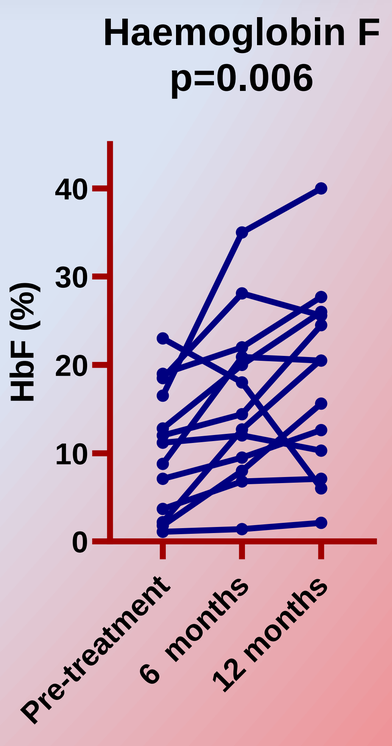
32 patients, median age 9 years (4-16 years) had been on hydroxycarbamide for a median time of 2 years (6 months-4 years), with doses ranging from 20- 35 mg/kg.

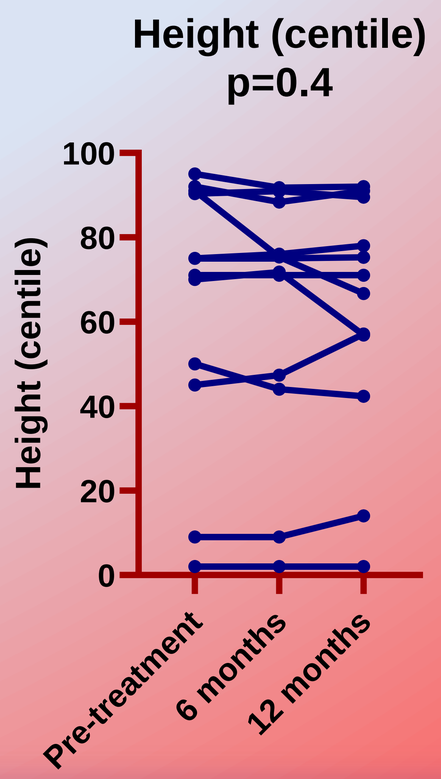
Haemoglobin levels had increased significantly from baseline in all patients at 1 year post hydroxcarbamide (p=0 .008). A similar increase was noticed in haemoglobin F (p= 0.006).

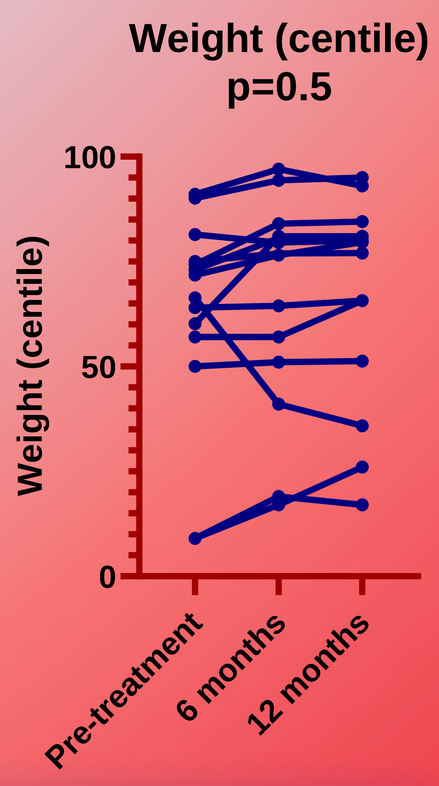
Height and weight centiles were maintained in all patients before and after taking hydroxycarbamide. Overall there was no significant change (p= 0.4 and 0.5 respectively). However, those on low weight centiles (below 9th, n= 4) they all had a significant increase in weight (11- 25th centile) ($p < 0.0001$).

Puberty occurred in 1 patient as expected without delay.









Conclusion

Studies showing effect of growth in children on hydroxycarbamide are limited. Our study shows that height and weight are maintained in the majority of children, and pubertal development is normal. We also identified that low weight children (< 9th centile) can increase weight significantly to healthier levels whilst taking hydroxycarbamide.

Parents do report better appetite in children whilst on hydroxycarbamide. Weight increase may be due to a combination of increased appetite as children feel less symptomatic, as well as a lower metabolic rate from reduced haemolysis. Larger studies are needed to determine the effects of hydroxycarbamide in growth velocity. We advise that parents should be counselled that underweight children may gain weight in beneficial ways whilst taking hydroxycarbamide.

1. *Growth velocity in children with sickle cell disease is reduced compared with children without sickle cell disease. Growth patterns in children with sickle cell anaemia during puberty Paediatri Blood Cancer 2009 53 (4) 635-64 2*
2. *Effect of Sickle Cell Anemia Therapies on the Natural History of Growth and Puberty Patterns Nagalapuram et al , J Pediatr Hematol Oncol. 2019 Nov;41(8):606-611*