Three Minute Article for Parents

Hydroxyurea reduces the blood transfusion burden in patients with thalassaemia

Sachith Mettananda https//orcid.org/0000-0002-0760-0418

Sri Lanka Journal of Child Health, 2022: **51**(4): 647
DOI: http://dx.doi.org/10.4038/sljch.v51i4.10393
(Keywords: Hydroxyurea, Blood transfusion, Thalassaemia)

Thalassaemia is a genetic disease of haemoglobin formation that causes severe anaemia from early infancy in affected children. It does not have an effective cure for the majority of patients. These patients require monthly blood transfusions to counteract anaemia. However, many die at very young ages due to complications related to blood transfusions[1].

We recently tested a new medication, hydroxyurea, as a treatment for thalassaemia. Our aim was to find out whether the amount of blood required by thalassaemia patients could be reduced by giving hydroxyurea[2]. Hydroxyurea has been used to treat certain types of cancers and was recently found to be useful in patients with sickle cell disease which is also a genetic disease of haemoglobin. It has been tried in some patients with less severe forms of thalassaemia (non-transfusion dependent thalassaemia); however, it has never been tested scientifically in severe forms of thalassaemia (transfusion-dependent thalassaemia)[3].

We performed the first-ever randomised, double-blind placebo-controlled clinical trial to test the effectiveness of hydroxyurea in patients with thalassaemia at the Colombo North Teaching Hospital of Sri Lanka between January 2019 and August 2021. Sixty patients with severe thalassaemia who were receiving monthly blood transfusions were selected for this study. They were randomly divided into two groups. One group received one or two capsules of hydroxyurea (based on the body weight) daily for six months, whereas the other group received a similar number of placebo capsules which are identical to hydroxyurea from outer appearance. Neither patients nor doctors knew whether a particular patient received the drug or the placebo until the trial was over[4].

We found that a higher proportion of patients who received hydroxyurea had high fetal haemoglobin. Forty-four percent of patients who received hydroxyurea showed a marked rise in fetal haemoglobin, thus responding well to hydroxyurea. These patients were labelled as hydroxyurea-responders. Hydroxyurea-responders required significantly less blood volume compared to hydroxyurea-non-responders and those who received placebo. The response to hydroxyurea was significantly higher in patients who had haemoglobin E-β-thalassaemia.

Based on the results of this study, we concluded that hydroxyurea reduced the transfusion burden in 40% of patients with thalassaemia. This has obvious advantages for these patients. Therefore, we recommend a therapeutic trial of hydroxyurea for severe forms of transfusion-dependent thalassaemia.

References

1. Mettananda S. Genetic and epigenetic therapies for β-thalassaemia by altering the expression of α-globin gene. *Frontiers in Genome Editing* 2021; **3**: 752278.

2. Yasara N, Wickramarathne N, Mettananda C, Silva I, Hameed N, Attanayaka K, *et al.* A randomised double-blind placebo-controlled clinical trial of oral hydroxyurea for transfusion-dependent β-thalassaemia. *Scientific Reports* 2022; **12**(1): 2752.

3. Yasara N, Premawardhena A, Mettananda S. A comprehensive review of hydroxyurea for beta-haemoglobinopathies: the role revisited during COVID-19 pandemic. *Orphanet Journal of Rare Diseases* 2021; **16**(1): 114.

4. Yasara N, Wickramarathne N, Mettananda C, Manamperi A, Premawardhena A, Mettananda S. Efficacy and safety of oral hydroxyurea in transfusion-dependent β-thalassaemia: a protocol for randomised double-blind controlled clinical trial. *BMJ Open* 2020; **10**(10): e041958