IRON CHELATING EFFICACY OF DEFERASIROX AND DEFERIPRONE COMBINATION THERAPY OF THALASSEMIA PATIENTS UNDER SRI LANKAN SETUP

S.L.M.D.J.K. Samarathunga

Postgraduate Institute of Science, University of Peradeniya, Peradeniya, Sri Lanka. Department of Biochemistry, Faculty of Medicine, University of Peradeniya, Peradeniya, Sri Lanka.

Beta thalassemia is a genetic disorder caused by absent or abnormal synthesis of beta chains of hemoglobin molecule. Subjects with thalassemia major require regular blood transfusion to sustain their lives. Regular blood transfusions increase the amount of iron present in the body. This will lead to iron overload in several organs such as liver, heart, endocrine and spleen. Iron chelating drugs bind with iron in body and form a complex with iron which can excrete with feces or urine. The efficient iron chelating drug should maintain negative iron balance in lower dosages with fewer drug related adverse effects.

Currently Deferasirox (DFX), Deferoxamine (DFO) and Deferiprone (DFP) are used as iron chelating drugs in iron overloaded patients. Deferasirox and deferiprone are oral drugs while Deferoxamine is given as intravenously. Because of the lesser pain and cost effectiveness, most patients prefer oral drugs than intravenous drugs. Assessing iron balance under different chelating treatments according to the Sri Lankan diet plan is very important, because iron absorbs daily through the meals of the patients.

Development of iron assessing model was the first part of this experiment. Then the method was trailed by using three healthy individuals. The average iron retention of healthy individuals was 2.283 ± 0.423 mg/day. Thalassemia International Federation Guidelines 2008 was shown that iron absorption of healthy individuals was 1-2 mg/day, the results of first part of this experiment was given similar results. Thus the iron assessing model was thought to use in second and third steps with thalassemia patients.

DFX and DFP drug doses were given according to the patient's body weight.

The iron balance under DFX treatment was given as follows. Patient without DFX dose was shown 0.683 positive iron balance as healthy individuals. Lower DFX dose was led to increase iron retention in thalassemia patients while higher doses of DFX decrease the iron retention and increase body iron excretion.

The total iron retention of thalassemia patients under DFX and DFP combination therapy was shown increment of iron retention with increasing DFX and DFP doses. But in lower doses the iron balance was shown negative value. Average iron balance per 1mg of DFP under DFX-DFP combination was higher than average iron balance per 1 mg of DFX under DFX monotherapy.

Average urine iron excretion was higher in DFX-DFP combination therapy, while average fecal iron excretion was higher in DFX monotherapy.

Briefly DFX and DFP combination treatment was shown higher negative iron balance than DFX monotherapy. But in combination of higher doses of DFP and DFX the iron retention tend to increase compared to the DFX alone. But with lower doses of DFX and DFP combination the iron excretion tend to increase. Thus using combination treatment with low doses is very useful to remove iron efficiently by reducing drug dose.