Determinants of high ferritin levels in very low birth weight infants

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Conclusions

- Independent determinants of elevated ferritin in VLBW infants were total erythrocyte transfusion dose, CRP and postnatal age.
- The majority of infants received multiple erythrocyte transfusions during the first weeks of life.
- More than one third of the ferritin samples were above >350 µg/L, indicating iron overload.

Table. Weekly transfusion data and corresponding iron doses.

Postnatal age (weeks)	Number of infants	Weekly erythrocyte transfusion dose (ml/kg)		Iron (mg)
		Mean	SD	
1	127	27.5	28.5	18.6
2	126	18.8	18.3	12.7
3	108	18.2	15.6	12.3
4	100	14.4	12.3	9.7
5	91	11	11.2	7.4
6	85	9	8.8	6.1
7	78	7.7	7.7	5.2
8	60	7.4	9.7	5
9	54	6.6	8.9	4.4

Results

- In a multiple logistic model the odds of elevated ferritin increased by 14% (95% CI 7.2-22%) per 10 ml/kg accumulated erythrocyte transfusion and by 77% (95% CI 23-156%) for elevated CRP, but decreased by 38% (95% CI 24-49%) per week of postnatal age. No association was found with z-weight at birth.
- Of the 831 ferritin samples, 293 samples showed high levels, >350 µg/L, indicating iron overload. Amounts of ferritin vs. accumulated erythrocyte transfusion dose are plotted in the Figure.
- During hospitalization, 115 (91%) infants received erythrocyte transfusions with a mean total dose of 115 ml/kg, equivalent to 77.8 mg iron. Weekly transfusion data is presented in the Table.
- VLBW infants had a mean gestational age of 26.9 weeks, and the mean birth weight was 901 g.

Introduction and Aim

The clinical care of very low birth weight infants (VLBW, <1500 g) often involve repeated erythrocyte transfusions, either to treat anaemia or to increase the oxygen binding capacity to promote oxygenation.

The aim of this study was to estimate the association between iron overload and erythrocyte transfusion, C-reactive protein (CRP) and weight change in VLBW infants.

Study population and Methods

- Longitudinal data on VLBW infants (n=127).
- Treated at Umeå University Hospital (UUH), Sweden, between 2010 and 2013.
- Of the included infants, all but 12 had received at least one erythrocyte transfusion.
- A multiple logistic model was fitted using generalized estimating equations.

VLBW infants born or transferred to UUH during first 24h of life
N=155

Treated <7 days at UUH, N=21

No analysed ferritin levels, N=7

Included infants
N=127

Figure. Accumulated erythrocyte transfusion dose vs. ferritin.