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## Background and Aims

Anaemia and erythropoietin (EPO) “resistance” in hemodialysis patients (HD) is a complex condition. [1-3] Premature loss of membrane asymmetry with phosphatidylserine (PS) exposure on the outer leaflet of the RBC membrane (eryptosis) of HD patients was linked to anaemia.[4] In-vitro experiments have shown that incubation of RBCs in buffers with low sodium concentration can trigger PS exposure and osmotic shock. [5, 6] We aimed to explore the relationship between eryptosis, pre-dialysis serum sodium levels and other parameters in HD patients.

## Methods

Whole heparin blood samples from stable HD patients were collected before dialysis treatment. We used flow cytometry with a BD FACSCalibur™ System to estimate level of eryptosis (with FITC-Annexin V binding, Roche) and reticulocytes count (with Retic-COUNT, BD Biosciences). All other parameters were from patients charts. Two-tailed homoscedastic TTEST was used to explore associations between parameters, P<0.05 was considered significant. Data are presented as mean ± standard deviation.

## Results

Thirty nine HD patients (11 African-Americans; 24 fistula; 7 grafts; 8 perm cath; mean age 53.9±17.3 years) were enrolled. Patients’ characteristics were as follows: weekly EPO dose 3118 units (0 - 14000); Hgb 11.74±1.68 g/dL; reticulocyte count 1.73±0.81%; albumin 4.1±0.4g/dL; ferritin 749±436ng/mL; iron 69±30mcg/dL; TSAT 31±13%. An average proportion of eryptotic RBC was 1.54±0.72%, ranging from 0.65 to 3.45%.

## Results

We found significantly higher levels of eryptosis in HD patients with pre-dialysis sodium levels below 140mmol/L (low Na group, 23 patients) compared to those with higher levels (high Na group, 16 patients) (1.78+/-0.76% vs 1.19+/-0.52%) (Table 1). At the same time, there was significant difference in reticulocyte count (1.31±0.51% vs 2.39±0.76% ) and Hgb (12.24±1.68 g/dL vs 10.93±1.38 g/dL) between Low EPO group (0 - 2400 Units) and High EPO (3500 – 1400 Units) groups respectively, but no differences in eryptosis.

## Conclusions

- HD patients with low plasma sodium concentration have significantly higher rates of eryptosis.
- Investigation of potential causative relationships between plasma sodium concentration, eryptosis and other erythrocytes parameters in HD patients will be subject of further investigation.

## References

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4. Boran, M., et al., Correction of anaemia in haemodialysis patients with recombinant human erythropoietin. *Int Urol Nephrol*, 1993. **25**(2): p. 197-203.
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Table 1.

	EPO, U	Hgb, g/dL	RETIC, %	Na*, mmol/L	IRON, mcg/dL	TSAT, %	FERRITIN*, ng/mL	Eryptosis*, %
High Na	2369+/-4,015	11.9+/-1.72	1.66+/-0.96	142+/-1	75.44+/-34.44	32.13+/-13.07	572.31+/-417.34	1.19+/-0.52
Low Na	3639+/-3,809	11.62+/-1.68	1.77+/-0.7	138+/-2	65.26+/-25.81	29.26+/-12.29	871.26+/-413.2	1.78+/-0.76