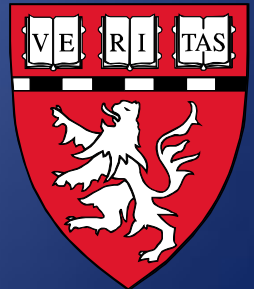


# Chronic Red Blood Cell Exchange In Patients With Iron Overload

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# Chronic Red Cell Exchange in Sickle Cell Disease

- Sickle Cells are removed
- Donor red cells are replaced isovolemically
- %HbS is diminished
- Desired hematocrit is targeted
- Risk of cerebrovascular accident (stroke) is decreased
- Iron levels can be diminished

# Transfusion Associated Iron Overload

- Results from chronic transfusion therapy
- Each Red Cell unit contains 250 mg iron
- Iron may deposit in liver, heart, spleen, pancreas
- Chelation therapy
  - Variable efficacy
  - Often poor compliance

# Clinical Indications for Red Blood Cell Exchange

- Sickle Cell Disease
- Intraerthryocytic parasite infections such as Malaria and Babesia

# Overview of Experience

- 5 Sickle cell disease patients on chronic exchanges
- Underwent monthly red cell exchanges
- Chronic Exchange over time - diminishes iron overload
- Each RCE procedure - decreases %HbS
- Each RCE procedure – targets desired hematocrit

# Patients

- Referred by Hematology Team
- Ferritin levels in 5 patients - 1035 to 5085
- Exchanged approximately every 4 weeks
- Increased exposure with RCE vs simple transfusion
- Pre procedural ferritin levels, hematocrit and hemoglobin electrophoresis drawn
- All had been on chelation therapy but ferritin remained elevated
  - 4 patients remained on chelation therapy while on chronic red cell exchange therapy program

# Procedural Considerations

- COBE<sup>®</sup>Spectra Apheresis Device
- Peripheral access 17G Fistula needle and 18G/20G angiocatheter
- Patient's height/weight/sex/current hematocrit
- Pre procedural ferritin level and hgb electrophoresis drawn
- Fraction of Cells Remaining (FCR) 25% - 30%
- Average hematocrit of replacement red blood cell units
- Patient's desired hematocrit (28% - 30%)

# Outcome Analysis

- Track pre procedural hgb electrophoresis
- Post procedural Hematocrit 28% - 30%
- Track serum Ferritin trend

# Changes in Ferritin

Patient	Gender Age/Yr	Concomitant Chelation Therapy	Treatment Interval	Ferritin at start of RCE	# of RCE's	Ferritin after RCE	Percent Decrease
A	M/20	Yes	22 months	1070	15	506	52.7
B	M/18	Yes	14 months	1297	13	722	44.3
C	M/18	Yes	13 months	5085	14	3808	25.1
D	M/18	No	13 months	1035	14	12	98.8
E	M/18	Yes	6 months	2629	7	2420	7.9

# Conclusions

- Chronic Red Cell Exchanges effectively reduced iron overload in SCD patients
- 3 additional patients have been enrolled in the Chronic Red Cell Exchange Program
- Data collection will be ongoing

# Children's Hospital Boston Apheresis Team

- Steven Sloan MD
- John Manis MD
- Richard Kaufman MD
- Grace Kao MD
- Li Chai MD
- John Luckey MD
- Beverly Gedutis RN
- Jennifer Cahoon RN
- Amy Lurie RN
- Cheryl Pacheco RN
- Lydia Martin RN
- Jacqui Lynch RN