Hematopoietic Progenitor Cell Collection: A Comparison of COBE Spectra and Spectra OPTIA Collection Efficiencies using ACD-A or ACD-A with Heparin Anticoagulation

James W. Smith, MD, PhD
Patti Latschar, PA-C
Debra Smith, MD, PhD
Mandi Kaiser, RN, HP(ASCP)

Oklahoma Blood Institute
Purpose

• HPC collections have been performed using the COBE Spectra for many years, including the use of a validated ACD-A with Heparin protocol since 2006.

• As transition to the Spectra OPTIA is needed for HPC collections, we performed prospective validations using either ACD-A with heparin (Hep) or ACD-A without heparin (No hep)
Methods- I

- Patients and donors in auto or allo transplant protocols and allo research
- Spectra vers 6.1 and OPTIA vers 11.0
- ACD-A with hep uses 3,000 IU hep in 750 mL ACD-A added at 1:16 ratio to WB
- ACD-A (no hep) added at 1:12 ratio to WB
- Auto patients: 2 to 3 bl vol in 4 hr proc
- Allo donors: 12 to 24 L or 2 bl vol
Methods- II

• Number of subjects:
  – Spectra 25, OPTIA Hep 95, No hep 47
• CD34 pos cells by BD FACSCalibur
• MNC by manual differential
• Platelet (CBC) by Sysmex 1700
• Collection Efficiency (CE) calculated by:
  – \((\text{Total cells in prod})/ (\text{pre} \times \text{vol processed})\)
  – or
  – \((\text{Total cells in prod})/ \{(\text{pre}+\text{post})/2\} \times \text{vol proc}\)
PRE CD34 Pos (Cells/uL)

Spectra Hep: [Bars with data]
Optia Hep: [Bars with data]
Optia No Hep: [Bars with data]

Legend: NS = Not Significant
LITERS WB PROCESSED

- Spectra Hep
- Optia Hep
- Optia No Hep

*NS*

*
FEEL GOOD. GIVE BLOOD.

CD34 e6/KG PRODUCT

- Spectra Hep
- Optia Hep
- Optia No Hep

* NS
FEEL GOOD. GIVE BLOOD.

Product % MNC

- Spectra Hep
- Optia Hep
- Optia No Hep

* Significant difference
NS Non-significant difference
HCT of Product

- Spectra Hep
- Optia Hep
- Optia No Hep

* NS
AC to Patient (mL)

- Spectra Hep
- Optia Hep
- Optia No Hep

Comparative values and notations:
- NS (Not Significant)
Results

- CE for both CD34 and MNC for Spectra: SD for Hep, NSD for No hep
- CE for platelets for Spectra SD (higher) compared to either OPTIA protocol
- Product volume, CD34 content, and Hct for Spectra SD (higher) than either OPTIA product
- Product MNC % SD (higher) but content lower for both OPTIA protocols
- ACD-A and Ca- NSD for OPTIA protocols
Conclusions

• Use of heparin on Spectra provides good CD34 and MNC CE with reduced citrate effects
• Use of heparin on OPTIA provides reduced CE of CD34 and MNC, less platelet loss
• OPTIA without heparin provides CE NSD from Spectra for CD34 with less platelet loss
• OPTIA with or without heparin: NSD for citrate used or supplemental Ca required
• Current OPTIA- heparin not useful