Maintaining Platelet Function In Whole Blood Stored During Acute Normovolemic Hemodilution: A Look At Temperature
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Disclosures
• No Disclosures

Introduction
In the United States:
• Every two seconds someone requires blood transfusion
• 36,000 units of RBC's are needed every day
• Nearly 21 million blood components are transfused each year
• Nearly 20% of all blood transfusions in the U.S. are associated with cardiac surgery

Bloodless surgery:
• Cell salvage
• Hemofiltration
• ANH
• Many more
Acute Normovolemic Hemodilution

- Endorsed by the ASA
- Sometimes called acute isovolemic hemodilution, intraoperative autologous donation, or simply “taking a unit off.”
- Used in a wide variety of surgical specialties including orthopedics, obstetrics, and cardiac

Advantages of ANH

- Most inexpensive way to harvest autologous blood
- Clerical errors are virtually nonexistent
- Accepted by Jehovah’s Witnesses
- Hemodilution
  - Hypothermic techniques
  - Fewer cells shed at the field
- Blood is spared from the heart-lung machine
- Fresh autologous whole blood
  - Storage lesion is negligible because the storage time is brief. Or
  - It is?
- Reduces and potentially eliminates subsequent homologous blood transfusions, but this is controversial

Blood Storage Review

- The development of the modern blood bank and component processing has significantly increased the time blood can be stored.
- What about storage prior to processing of components?
Literature Review Highlights - Finding The Gap

- AABB Primer of Blood Administration(8):
  - Continuous agitation does not significantly benefit platelets during the brief 8 hour storage of ANH collected blood(3,6,7,13)
- What about temperature?
  - Operating room (OR) temperature is recommended to be between 68° F - 75° F, or 20° C - 24° C (According to AORN), but reported as cold as 13° C(15)
  - Rapid loss of platelet functional activity at 4° C, but few, if any, papers evaluate effects of OR temperature range(2)

Research Question and Hypothesis

- **Research Question:** What effect does OR temperatures below 20° C - 24° C have on platelet function in whole blood?
- **Hypothesis:** Platelet function will not be maintained when stored at OR temperatures below 20° C - 24° C over a period of 8 hours.
- **Null Hypothesis:** Platelet function will be maintained when stored at OR temperatures below 20° C - 24° C over a period of 8 hours.

Methods
Methods Continued

14°C
57°F
18°C
64°F
22°C - 24°C
72°F - 75°F

Results

Discussion

• 8 hour 22° C - 24° C group best maintained platelet function
  • Will this type of temperature management improve ANH overall? Leading to fewer homologous transfusions?
  • How can we warm blood in colder operating rooms?

• The ideal anticoagulant for accurate platelet function testing remains cont:

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Special Thanks To:

- David Holt
- Ben Greenfield
- Sue Stewart
- Jon Henderson and the Sienco team
- Elizabeth Nelson
- Matthew Hansen
- Robin High
- Ed Rau
- Physicians Laboratory Services, Robert Bowen
- Family, Friends, and Classmates

References


