Clinical efficacy of washed autotransfusion in non-cardiac settings such as vascular, orthopedic and obstetric surgery: subgroup analysis of a systematic review and meta-analysis of randomized control trials

Waters J.H., Meier J., Myers G., Martinetti M., Bagnardi V.
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INTRODUCTION

• Washed autotransfusion (w-ATS) is a contemporary blood management strategy that is widely used in cardiac surgery and recommended by the American Society of Thoracic Surgeons and the Society of Cardiovascular Anesthesiologists.

• Nevertheless, it is not universally utilized in many non-cardiac applications despite its potential benefits in reducing red blood cell transfusion and improving patient outcomes.

OBJECTIVE

• A systemic review and meta-analysis investigated the efficacy of intra and/or postoperative w-ATS in reducing allogeneic blood transfusions during major surgical procedures other than cardiac surgery, such as orthopedic, vascular and obstetric surgery.

METHODS

SEARCH METHODS

• A literature search was performed in Pubmed for randomized controlled clinical trials (RCT), published before September 2016, comparing:
  - w-ATS vs. standard suction drainage, or
  - w-ATS used with other active strategies intended to minimize allogeneic transfusion* vs. the same active strategies.

PRIMARY OUTCOME INVESTIGATED

• Risk ratio (RR) for allogeneic blood transfusion in the w-ATS group compared with the control group.

SECONDARY OUTCOMES INVESTIGATED

• Mean difference (MD) between w-ATS and control group of:
  - packed red blood cells (PRBC) units transfused
  - total blood loss
  - post-operative hemoglobin levels
  - length of hospital stay (LOS)

* The considered active strategies intended to minimize allogeneic transfusion are: use of topical hemostatic agents (Thompson, 1990); preoperative autologous donation (Mah 1995); use of treatment for anemia (Liang, 2015 and Springer 2016); acute normovolemic hemodilution and allowing for moderate hypotension during bleeding (Lisander, 1996).
RESULTS

SEARCH RESULTS

- 21 RCTs comprising of 1,922 patients who underwent w-ATS in different surgical settings:
  - 15 RCTs in orthopedic surgery
  - 5 RCTs in vascular surgery
  - 1 RCT in obstetric surgery
86 RCT selected

PRIMARY OUTCOME

- The use of autotransfusion significantly reduced the risk of exposure to allogeneic blood transfusions by as much as 51%
- Stratified analyses according to type of the comparison group (standard vs active treatment), type of surgery (orthopedic vs. vascular) and year of publication (<2000 v.s ≥2000) revealed similar protective effect of w-ATS across strata. However, it reveals that it is more beneficial in reducing exposure to allogeneic blood in programs using restrictive transfusion protocols (Hgb < 8.5 g/dl)

SECONDARY OUTCOMES

- W-ATS appears to reduce the number of PRBCs by 1.1 units and the LOS by 1.0 day
- No significant difference highlighted for post-operative Hb levels and total blood loss

CONCLUSION

- The use of washed autotransfusion in non-cardiac settings such as vascular, orthopedic and obstetrics surgery significantly reduces the risk of exposure to homologous blood products regardless of the surgical settings, the type of comparison group and the study period.
- In addition, the protective effect of w-ATS on the risk of allogeneic transfusion is found to be significantly greater when adopting a restrictive transfusion policy, rather than those studies with a less restrictive policy.
- Wash autotransfusion should be considered as an essential technique to be integrated in the Patient Blood Management program within the hospitals.