Effect of intraoperative autologous transfusion techniques on perioperative hemoglobin level in idiopathic scoliosis patients undergoing posterior spinal fusion: A prospective randomized trial

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Abstract

Background: Massive blood loss during posterior spinal fusion for adolescent idiopathic scoliosis remains a significant risk for patients. There is no consensus on the benefit of acute normovolemic hemodilution (ANH) or intraoperative cell salvage (ICS) in scoliosis surgery. Methods: Patients were randomized to one of two groups. Group A received ANH and ICS during operation, while group B received only ICS. Patients' age, sex, height, weight, body blood volume, number of fusion level, Cobb angle, number of screws, duration of surgery, and skin incision length were recorded. Hemoglobin and hematocrit levels were obtained preoperatively and postoperatively (0 h and 24 h). Results: There were 22 patients in each group. There was no significant difference in total blood loss. The perioperative decrease in hemoglobin levels between preoperation and postoperation 24 h (group A 2.79 ± 1.15 and group B 2.76 ± 1.00) showed no significant difference (p = 0.93). Group A observed a larger decrease in hemoglobin levels at postoperative 0 h relative to preoperative level (2.57 ± 0.82 g/dl), followed by a smaller decrease within the next 24 h (0.22 ± 1.33 g/dl). Group B showed a continued drop in hemoglobin levels of similar magnitude at postoperation 0 h (1.60 ± 0.67 g/dl) and within the next 24 h (1.16 ± 0.78 g/dl). One patient from group B received 1 unit of allogenic blood transfusion (p = 0.33). Conclusions: The addition of ANH to ICS in posterior spinal fusion surgery for AIS resulted in a similar decrease in hemoglobin levels between preoperative values and at 24 h postoperatively.

Keywords

acute normovolemic hemodilution, adolescent idiopathic scoliosis, blood loss, intraoperative cell salvage, posterior spinal fusion

Introduction

Massive blood loss during posterior spinal fusion (PSF) for adolescent idiopathic scoliosis (AIS) remains a significant risk for patients. Excessive bleeding is a common perioperative complication with a prevalence of 0.85%.¹ Yoshii-hara et al. noted that the transfusion rate of allogenic blood was stable (over a 10 years period) with transfusion rate as high as 23.0%.² This is despite an advancement in the surgical technique for AIS.³ ⁴

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