Use of Trendelenburg Position for Intradialytic Hypotension

Clinical Concerns
- What does the Trendelenburg position do and is it the best position for the patient?
- What is the evidence?
- Should the Trendelenburg position be used?

Purpose of Trendelenburg position
Patient is supine with the head of the bed/chair tilted 45 degrees downward.
- Blood is circulated out of the patient’s body during hemodialysis and ultrafiltration results in fluid removal and possible decrease in intravascular volume. As a result, patients may become hypotensive.
- Patients are placed in Trendelenburg position with the belief that it causes increased cardiac filling and increased blood pressure.
- It has been addressed often in hemodialysis procedure manuals for the treatment of intradialytic hypotension.

Background leading to current practice
- In the early twentieth century, physicians began to advocate for the use of Trendelenburg position in the treatment of hemorrhagic shock because of its ability to divert blood from the lower extremities to the central circulation, augmenting cardiac filling by increasing right and left ventricular preloads, stroke volume and cardiac output.
- Current treatment of hypotension may include the following: stopping or reducing the rate of ultrafiltration, decreasing blood flow rate, restoring intravascular volume with an infusion of normal saline, and the Trendelenburg position. Patients may be kept in this position for 30 minutes up to several hours until the blood pressure increases and the patient feels better.

What does the evidence say?
Physiologic effects of Trendelenburg position in patients who are hypotensive may include:
- anxiety and restlessness,
- progressive dyspnea,
- hypoventilation and atelectasis caused by reduced respiratory expansion,
- altered ventilation/perfusion ratios from gravitation of blood to the poorly ventilated lung apices,
- increasing venous congestion within and outside the cranium leading to increased intracranial pressure,
- pressure from abdominal organs is transmitted into the thoracic cavity, which can impair venous return to the heart, leading to a further decreased cardiac output and hypotension,
- increased risk of aspirating gastric contents.
There are increased occurrences of adverse consequences of Trendelenburg in patients who are or have:
• obese and/or have compromised right ventricular ejection fraction,
• pulmonary disorders,
• head injury,
• ventricular hypertrophy,
• cardiac dysfunction,
• arrhythmia,
• reduced blood filling the heart,
• stroke reduction,
• hypotension.

The Trendelenburg position is probably not indicated or may have harmful effects in:
• resuscitation of patients who are hypotensive,
• patients in whom mechanical ventilation is difficult or patients with decreased vital capacity,
• patients who have increased intracranial pressure,
• patients who have cerebral edema,
• patients who have increased intraocular pressure,
• patients with ischemia of the lower limbs.

Recommended changes to practice:
• Literature review data to support the use of the Trendelenburg position are limited and do not reveal any beneficial or sustained changes in systolic blood pressure or cardiac output.
• There are no randomized control studies to show a benefit from the use of the Trendelenburg position.
• Trendelenburg position could continue to be considered in the treatment of intradialytic hypotension, for as short of a duration as possible. Efficacy may be limited by potential side effects.

Research regarding the role of Trendelenburg position in the management of intradialytic hypotension and an increased awareness of potential problems associated with this position need to be addressed in patients on hemodialysis.

Before you automatically put the dialysis chair or bed into Trendelenburg position, stop and consider the impact of this position to the patient as part of your assessment.

Treatment Options for Intradialytic Hypotension
• Re-evaluate dry weight,
• Fluid management protocols,
• Lower dialysate temperature,
• Sequential ultrafiltration,
• Reduce UFR, increase time on dialysis,
• Hold blood pressure medications until after dialysis,
• Place patient flat with feet elevated,
• Blood volume monitoring,
• Oxygen saturation monitoring and possible use of oxygen therapy.

References