Cochrane Nursing Care Field: Human albumin for intra-dialytic hypotension in haemodialysis patients

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COCHRANE Nursing Care Field

Review question

What is the best available evidence on the safety and efficacy of using human albumin for the treatment of intra-dialytic hypotension (IDH) in haemodialysis patients?

Relevance for clinical practice

Hypotension is the most common intra-dialytic complication occurring in 20%–50% of the haemodialysis sessions (Irwin & Rippe, 2003). Despite the use of a variety of preventative measures, such as sodium profiling, sequential ultrafiltration and prescription dialysate, some patients still experience the adverse effects of a sudden drop in blood pressure (BP). The main cause of this unpleasant complication is fluid removal during the dialysis procedure, although other factors are also known to contribute, for example the components of the dialysis procedure and other patient-specific factors such as left ventricular dysfunction.

The primary mode of treatment is to replace fluids as a means of increasing the circulating blood volume. While fluid replacement can have favourable short-term results in correcting the hypotension and relieving the symptoms, the long-term effects can cause more serious complications such as cardiac or cerebral ischaemia. Several fluids can be used for this purpose such as saline, human albumin, gelatin or starches. The use of albumin as a replacement fluid is controversial, mainly due to the cost implications as well as the potential for transmission of blood-borne viral disease such as Creutzfeldt-Jacob Disease (CJD).

Nurses need to be aware of the benefits and risks associated with the fluids they are using for treatment to enable them to make informed choices when selecting a fluid for the correction of IDH. This is especially true where there is an increased potential for hypotension during haemodialysis associated with increasing age and comorbid conditions of future dialysis patients.

This review was performed to determine if albumin provides a therapeutic advantage over other fluids in the treatment of hypotension during dialysis.

Characteristics of the evidence

The search focused on randomised, controlled trials (RCTs), quasi-RCTs and randomised, crossover studies investigating the use of human albumin, alone or in combination with other fluids for treatment of IDH in maintenance haemodialysis patients. There was a requirement that all participants be adults undergoing long-term haemodialysis and experiencing episodes of systematic IDH. IDH was defined as a decrease in systolic BP of at least 10 mmHg or a systolic BP less than 100 mmHg with symptoms such as cramps, nausea, vomiting and dizziness.

One study met the inclusion criteria for the review, which compared albumin to normal saline; no other trials were identified that compared albumin with any other fluid. Adults who received haemodialysis treatments for a minimum period of three months and who had experienced at least three episodes of IDH in the 60-day period leading up to enrolment into the study were included. Patients were excluded if they were known to have sensitivity to albumin.

This was a well-conducted trial involving 45 patients arranged into evenly balanced

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Systematic review, hypotension, haemodialysis, albumin, safety, efficacy.

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groups, randomised to two treatment sequences. Sequence one patients received 5% albumin to treat the first episode of IDH, with the second and third episodes of IDH treated with normal saline. Patients in sequence two received normal saline to treat the first episode of IDH, with the second and third episodes of IDH treated with 5% albumin.

The primary outcome measure was the percentage of the target ultrafiltration achieved. The secondary outcome measures were post-dialysis systolic and diastolic BP, volume of study fluid used, time to restore BP and total nursing time to treat hypotensive episodes. The results of this trial showed no significant difference between albumin and saline in the percentage of target ultrafiltration achieved.

In summary, the study showed that 5% albumin is not superior to normal saline for the treatment of symptomatic hypotension in maintenance haemodialysis patients with a history of IDH.

Implications for clinical practice

There is insufficient evidence to support the therapeutic advantage that albumin has over crystalloids or non-protein colloids for the treatment of symptomatic hypotension during haemodialysis

The evidence suggests that there is no significant clinical benefit of using 5% albumin over normal saline; therefore, saline should be the first-line treatment of IDH in stable dialysis patients.

Implications for research

Further studies are required comparing albumin to crystalloids or non-protein crystalloids for the prophylactic maintenance of blood value and BP during haemodialysis for patients at risk of hypotension.

There is a need to compare the efficiency of non-protein colloids such as pentastarch versus albumin for the treatment of IDH.

Reference

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