Learning from serious incidents related to dialysis

March 2009 – updated report

Chronic haemolysis at a satellite haemodialysis unit due to chloramine in the water supply

A small water treatment works in a rural area was undergoing planned improvement work to upgrade the site. Whilst the work was undertaken, treated water from a nearby water treatment works was used to supplement the existing supply. The water used to supplement the supply came from a works that uses chloramination as its means of disinfection. This resulted in an increase in chloramine levels in mains water in the area where the satellite dialysis unit was based. Water drinking standards were not exceeded, but the charcoal filters at a satellite haemodialysis unit were overwhelmed. This resulted in the development of a degree of chronic haemolysis in the majority of patients in the unit which was recognised because of a marked fall in the haemoglobin levels in a small number of patients. The high chloramine levels had also been identified through the regular monitoring of pre and post filtration water. However, in the absence of a formal policy, this had not been further assessed.

Once identified, a rapid response was agreed which limited further exposure and prevented any long term harm. The charcoal filters have been replaced with an improved system with a greater absorbent capacity, the unit has developed and strengthened its policy around chloramine monitoring, and has strengthened relevant training processes for staff.

Two home haemodialysis patients have also experienced chronic haemolysis which is believed to be secondary to chloramine in the water supply. The haemolysis may have been contributed to by the duration of the intervals between the replacement of carbon filters in the home haemodialysis machines.

Acute and chronic haemolysis, as a result of raised chloramine levels, is well recognised in the published literature. However, a number of incidents involving high chloramine levels, with or without secondary haemolysis, have recently occurred in the UK. In recent years, water companies across the UK have increased their efforts to prevent bacterial water contamination. Consequently, there may be a greater risk that chloramine levels in the water supply, although meeting drinking water standards, might overwhelm carbon filters that are relatively small, or in the case of home haemodialysis patients, where filters are not changed at an optimal frequency.

Action: N.B. It should be noted that this is an updated report. The reporters have clarified that these incidents refer only to the effects of chloramine and not of chlorine.

Renal dialysis units should consider:
(a) Whether renal units have a testing regime in place in relation to chloramine, particularly where local water treatment plants are moving from using free chlorine to chloramine to disinfect the water supply
(b) What local awareness there is on how to respond to raised chloramine levels in post filtration water
(c) What is the reserve capacity of carbon filters to deal with surges in chloramine levels
(d) Whether there would be any benefit in a local audit of the frequency with which carbon filters are changed by home haemodialysis patients

Please submit comments, solutions, and personal experience to:

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