REDUCING THE RISK OF MEDICINES ERRORS WITH INTRAVENOUS MAGNESIUM SULFATE

Intravenous magnesium sulfate has the potential to cause serious harm or death when used incorrectly.

Reasons for the risk are:
- Different ways of expressing the same dose (%w/v, g, mmol and ml)
- Wrong dose — overdose or under dose as a result of dilution
- Limited range of presentations at the required concentration
- Calculation and administration errors

In England between 1st January 2010 and 19th December 2012, 1025 incidents relating to magnesium were identified. Five, all related to injectable magnesium were found to be reported as death or severe harm.

PROJECT AIMS
- To raise awareness that diluting magnesium sulfate in the clinical environment is unsafe
- To provide information and a process for Trusts to review practice and implement safer solutions
- To increase the availability of safer products

Actions:
Focused on obstetrics due to use of magnesium sulfate for eclampsia and as a neuro protector for preterm babies.

Benchmark of current practice: All but one Trust were using 50% magnesium sulfate and diluting to 20% (the maximum strength for IV administration) in obstetrics. Guidelines for management of Eclampsia required a 4g loading dose and 1g maintenance dose of magnesium sulfate (http://pathways.nice.org.uk/pathways/hypertension-in-pregnancy NICE 2016). All Trusts had calculations in their Eclampsia management guidelines, but we discovered some of these resulted in the wrong concentration.

Resources: Collaboration with specialist pharmacists, chief pharmacists network and NHS England medicines safety pharmacists resulted in a bulletin to highlight the risks and outline actions to be taken to reduce them. Midwives helped design a poster for clinical areas to raise awareness of the risks.

Procurement: The specialist procurement pharmacist worked to get safe labelling on magnesium sulfate vials, and to fast track a licence for a 20% product.


Lessons learned:
Current practice needs to be challenged: although it was an NPSA alert in 2007, Midwives didn’t know that there was a safer preparation and pharmacists were not aware of the potential problem as magnesium sulfate was infrequently used in obstetrics.

Success has been down to regional championing and push from a number of directions e.g. chief pharmacists, maternity networks, neonatal networks.

Results: Publication and dissemination of the bulletin and poster has raised awareness of the risks associated with diluting Magnesium Sulfate in clinical areas. We are monitoring purchasing of the 20% preparation (see graph) and 10 out of 14 Trusts are currently buying this compared to 1 Trust pre-project. Shared Maternity guidelines have been updated http://goo.gl/yzZeXA.

This work was led by Wessex AHSN, but would not have happened without: Alison Ashman, Regional Specialist Procurement Pharmacist; Carina Livingstone and Julia Wright, NHS England Specialist Pharmacy Service; David Gerrett, NHS England Medication Safety Team; Julie Woodman, Midwife, Portsmouth Hospitals; Thames Valley and Wessex Chief Pharmacists Network.