# Briefing document

Vinca alkaloids – administration via intravenous minibag only

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About the IMSN

The Irish Medication Safety Network (IMSN) is an independent group of pharmacists and other specialists working in the acute sector, whose principal aim is to improve patient safety with regard to the use of medicines through collaboration, shared learning and action.

The following IMSN guideline was originally published in the Irish Pharmaceutical Journal, based on best practice guidance, in February 2008. This second version was revised in June 2010.

The Irish Medication Safety Network can be contacted via irishmedsafety@gmail.com
Introduction & Background

The World Health Organisation (WHO) has published guidance in relation to administration of vinca alkaloids via intravenous minibag infusion to avoid accidental death. The vinca alkaloids, vinCRIStine, vinBLAStine and vinorelbine, are derived from the Madagascar periwinkle, and are administered intravenously in the treatment of cancer. VinCRIStine is the most commonly used of the vinca alkaloids.

Since 1968, inadvertent spinal administration of vinCRIStine has been reported in a variety of international settings 55 times. The accidental injection of vinCRIStine into the spinal canal (intrathecal administration) has a mortality rate of almost 100%. Inadvertent intrathecal administration has resulted in patients developing ascending paralysis due to encephalopathy, spinal nerve demyelination and intractable pain, leading almost always to a slow and painful death. Various measures have been adopted over the years to try to prevent this error but it reoccurs again and again.

In Hong Kong (July 2007) a 21 year old died after being administered vinCRIStine accidentally via a spinal route. More recently, in the American press, another fatal event was reported where IV vinCRIStine was accidentally given into the central nervous system. Soon after injection the error was realized, but despite intervention, the patient subsequently died two weeks later. Similar events have occurred in both the U.S.A. & Spain in 2005, and in Australia in 2004. This highlights the worldwide nature of this problem.

Earlier initiatives for safer vinca alkaloid administration

Previous measures attempting to prevent this error have included recommendations that intravenous medications not be given the same day that a patient is due to receive intrathecal medications, labelling the medication “FOR INTRAVENOUS USE ONLY” and that the volume of vinca alkaloids be diluted to larger volumes e.g. in 20ml sodium chloride 0.9% in a syringe.

Guidance in relation to administration of vinCRIStine via syringe has been superseded, as fatal incidents have been reported due to the inadvertent administration of vinCRIStine by the intrathecal route, even where large volume syringes have been used as a safety measure.

WHO vinca alkaloid Safety recommendations

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<td>The WHO World Alliance for Patient Safety has consulted expert opinion widely and recommended:</td>
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<td>1) The labelling of vinca alkaloids should include a clear warning label that reads: ‘FOR INTRAVENOUS USE ONLY - FATAL IF GIVEN BY OTHER ROUTES’.</td>
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<td>2) Syringes should not be used for vinca alkaloid administration.</td>
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<td>3) Vinca alkaloids should where possible be prepared by dilution in small volume intravenous bags (the ‘minibag’ technique), rather than in a syringe, to protect against accidental administration via a spinal route.</td>
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Practice in Aseptic units in Irish hospitals

Hospitals in Ireland should review their practice of vinca alkaloid formulation and administration, in the light of WHO and international guidance. The Safety & Quality Council of Australia, the Joint Commission (USA), the Institute of Safe Medication Practices (USA), FDA (USA), and the National Patient Safety Agency (UK) all support the use of a minibag to administer vinCRIStine.

In practice, many Irish hospitals now dilute their vinca alkaloid preparations to 50mLs – 100mLs in Sodium Chloride 0.9% for intravenous administration.

If syringes are used, e.g. for paediatric use, the Institute of Safe Medication Practices state the syringe must be dispensed in overwrap which bears the statement “Do not remove covering until the moment of injection. For IV use only”.

Administration Guidance

Preparation of vinca alkaloids in a minibag prompts doctors and nurses to question any error as patient positioning makes it difficult to attach a bag to a spinal needle, and fluid bags are only rarely delivered via a spinal route. In addition, knowing that the cerebrospinal fluid is only 150ml gives an instinctive understanding that it is dangerous to deliver large volumes of fluid via a spinal route.

Monitoring

Vinca alkaloids are vesicant drugs i.e. they can cause damage if there is leakage from the vein into the surrounding tissue (known as extravasation) which may lead to a lot of pain and severe necrosis at the site.

While administering vinca alkaloids via minibag IV infusion has been criticised as potentially increasing the risk of extravasation injury, reported incidence is similarly infrequent for both syringe and minibag. Since the introduction of the WHO guidance in Irish hospitals, the IMSN is not aware of any increase in the rate of vinca alkaloid extravasation reports.

Conclusion

The gold standard is to create a unique ‘lock and key’ design of needles, syringes, catheters, tubing and bags so that medications intended for intravenous administration cannot be administered via the spinal route and vice versa.

Several manufacturers are working on these products which will hopefully, soon be available. Further information and links to a FDA patient safety video on the topic are available via www.ismp.org
References


13. Personal communication Irish Medication Safety Network (IMSN) secretary to IMSN E-mail network 21 May 2010 - Request for extravasation reports post vinca alkaloid minibag introduction