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NATIONAL PATIENT SAFETY AGENCY (NPSA) RAPID RESPONSE REPORT 011 – REDUCING RISK OF OVERDOSE WITH MIDAZOLAM INJECTION IN ADULTS (DECEMBER 2008)

The NPSA has identified serious problems relating to the use of midazolam for conscious sedation in adults[1]; in the period November 2004 to November 2008 they were notified of a total of 498 incidents related to the use of midazolam (including three deaths). Analysis of the reports received revealed a risk of patients receiving excessive doses of midazolam due to confusion between the high strength (5mg/ml) and low strength (2mg/ml) preparations as well as incorrect titration of dose.
This resulted in frequent reliance on injectable flumazenil (an antagonist/reversing agent) for reversal of sedation in patients that had been inadvertently over-sedated with midazolam.

The following actions are required to be implemented by **9th June**:

- Ensure that the storage and use of high strength midazolam (5mg/ml in 2ml and 10ml ampoules; or 2mg/ml in 5ml ampoules) is restricted to general anaesthesia, intensive care, palliative medicine and clinical areas where its use has been formally risk assessed, for example, where syringe drivers are used.
- Ensure that in all other clinical areas, storage and use of high strength midazolam, is replaced with low strength midazolam (1mg/ml in 2ml or 5ml ampoules)
- Review therapeutic protocols to ensure that guidance on use of midazolam is clear and that the risks particularly for the elderly or frail are fully assessed.
- Ensure that all healthcare practioners involved directly or participating in sedation techniques have the necessary knowledge, skills and competences required.
- Ensure that stocks of flumazenil are available where midazolam is used and that the use of flumazenil is regularly audited as a marker of excessive dosing of midazolam.
- Ensure that sedation is covered by organisation policy and that overall responsibility is assigned to a senior clinician which in most cases will be an anaesthetist.

These recommendations relate to all healthcare areas where conscious sedation is required. This will mainly be within secondary care, but may also apply to primary care where endoscopies, minor surgery and dental procedures are carried out.

PACEF Recommendations: Midazolam for conscious sedation

(1) Where conscious sedation is required use only the low strength midazolam 1mg/ml in 2ml and 5ml ampoules.

(2) Practices should ensure that there are clear polices and protocols in place to support the use of midazolam in conscious sedation which comply with the recommendations contained within NPSA RRR011.

(3) Where procedures requiring conscious sedation are being carried out, practices should ensure that adequate stock of flumazenil are maintained and that all staff who may be required to administer flumazenil are adequately trained.

(4) Practices should ensure that there are clear polices and protocols in place to support the use of flumazenil to reverse the effects of midazolam, if stocked for this purpose.

(5) All community pharmacies and general practice run dispensaries should ensure that different strengths of midazolam injection (where stocked) are stored separately.

The main use for midazolam injection within a primary care setting is in palliative care where midazolam may be used for the relief of terminal agitation, terminal breathlessness and intractable hiccup.[2] Doses can vary and may range from single or prn subcutaneous doses of 5-10mg to 30-60mg as an subcutaneous infusion over 24 hours. A recent review of prescribing data for the primary care trust has shown that the most commonly prescribed preparation within primary care is midazolam injection 5mg/ml 2 ml ampoules which accounts for 81.5% of midazolam injection currently prescribed. Whilst the use in palliative care medicine is not specifically detailed within the Rapid Response Report, PACEF have made the following recommendations:

PACEF Recommendations: Midazolam for symptom relief in palliative care

(1) For symptom relief in palliative care, use only midazolam injection 5mg/ml, 2ml ampoules, where possible. To avoid confusion only one ampoule size should be used.

(2) All health care staff involved in the administration of midazolam whether by subcutaneous injection or subcutaneous infusion should double check the strength and volume of preparation to be used.

(3) All community pharmacies and general practice run dispensaries should ensure that different strengths of midazolam injection (where stocked) are stored separately.

The Prescribing & Medicine Management Team will continue to review the prescribing of midazolam injection and will follow up any use of the lower strength midazolam injection to ensure compliance with the recommendations contained with this Rapid Response Report.

References

1. National Patient Safety Agency Rapid Response Report No 11 (NPSA/2008/RRR011) 9th December 2008.
2. Palliative Care Formulary 3rd Edition

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