Welcome to the first issue of the newly launched Drug Safety Update. This regular monthly electronic bulletin takes the place of Current Problems in Pharmacovigilance, which was previously sent in hard copy to certain healthcare professionals.

Drug Safety Update aims to bring you the latest information and clinical advice from the Medicines and Healthcare products Regulatory Agency (MHRA) and its independent advisor the Commission on Human Medicines (CHM), whose advice about the safe use of medicines underpins the updates and information in this bulletin.

This bulletin is intended for all healthcare professionals who work in the UK—doctors, pharmacists, nurses, dentists, allied health professionals, and coroners. We have designed it so that you can find quickly the information that is relevant to your practice. Keywords on main articles enable you to locate items of particular relevance to your area of interest. Wherever possible, we have indicated where you can access additional information, and websites are highlighted with hyperlinks for ease of use.

We hope that you will find this bulletin a useful addition to your information sources. Please tell us what you think of it, and if you have ideas for how we can continue to improve it we would be pleased to receive them.

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Drug safety advice

Gadolinium-containing MRI contrast agents: nephrogenic systemic fibrosis

**Keywords:** Gadolinium-containing contrast agent, MRI, nephrogenic systemic fibrosis, renal impairment, neonates

Omniscan (gadodiamide) and Magnevist (gadopentetate dimeglumine) should not be used in patients with severe renal dysfunction

Gadolinium-containing contrast agents are used widely in clinical practice to aid magnetic resonance imaging (MRI) of the body and of the blood vessels (magnetic resonance angiography, MRA).

In 2006, the gadolinium-containing contrast agent Omniscan (gadodiamide) was associated with an increased risk of a debilitating and sometimes fatal disorder called nephrogenic systemic fibrosis (NSF, also called nephrogenic fibrosing dermopathy or NFD) in patients with severe renal impairment. NSF has been reported only in patients with renal dysfunction, who have reduced ability to clear the contrast agent from the body. Characteristics of NSF are formation of connective tissue in the skin which becomes thickened, coarse, and hard, sometimes leading to contractures and joint immobility. Systemically, other organs might be involved, including the lungs, liver, muscles, and heart. There is no consistent, successful treatment for NSF, although improvement of renal function can slow or arrest development.

The exact mechanism by which a gadolinium-containing contrast agent can cause NSF is not known. However, under some conditions gadolinium ions (Gd³⁺) are released from chelate complexes through a process of transmetallation with endogenous ions in the body and can accumulate in the skin and other tissues. Gadolinium-containing MRI contrast agents have different levels of NSF risk based on their physicochemical and pharmacokinetic properties (see table). Risk of NSF is considered to be highest with Omniscan and OptiMARK, which have a linear chemical structure with excess chelate, carry no molecular charge, and seem more likely to release free Gd³⁺ into the body. Those that are cyclical in structure (eg, ProHance, Gadovist, and Dotarem) are least likely to release free Gd³⁺ into the body. Between these two groups are those that carry a molecular charge and have a linear structure (eg, Magnevist, MultiHance, Primovist, and Vasovist).

**Advice for healthcare professionals:**

- Patients with severe renal impairment (ie, glomerular filtration rate [GFR] <30mL/min/1.73m²) should not be given Omniscan or Magnevist
- These agents should be used with caution in patients with moderate renal impairment (ie, GFR 30–59mL/min/1.73m²)
- Omniscan and Magnevist should be used with caution in neonates and infants up to age 1 year because of their immature renal function
- All patients (in particular those older than 65 years) should be screened for renal dysfunction by obtaining a history or laboratory tests, or both

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2 International Center for Nephrogenic Fibrosing Dermopathy Research (ICNFDR) http://www.icnfdr.org


For further information see http://www.mhra.gov.uk/home/idcplg?IdcService=SS_GET_PAGE&useSecondary=true&issDocName=CON200229&issTargetNodeId=221
• Haemodialysis shortly after administration of a gadolinium-containing contrast agent in patients currently receiving haemodialysis may help remove the contrast agent from the body. However, there is no evidence to support the initiation of haemodialysis for prevention or treatment of NSF in patients who are not already undergoing haemodialysis.

• Patients with normal renal function do not seem to be at increased risk of NSF.

Knowledge on this issue is evolving: after the contraindication of Magnevist, the safety of other linear ionic gadolinium containing contrast agents (eg, MultiHance, Primovist, and Vasovist) is under close review.

<table>
<thead>
<tr>
<th>Brand name (generic name)</th>
<th>Chemical structure</th>
<th>Charge</th>
<th>Elimination pathway</th>
<th>Protein binding</th>
<th>Cases of NSF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Omniscan (gadodiamide)</td>
<td>Linear</td>
<td>Non-ionic</td>
<td>Kidney</td>
<td>None</td>
<td>Yes</td>
</tr>
<tr>
<td>OptiMARK (gadoversetamide)</td>
<td>Linear</td>
<td>Non-ionic</td>
<td>Kidney</td>
<td>None</td>
<td>Yes</td>
</tr>
<tr>
<td>Magnevist (gadopentetate dimeglumine)</td>
<td>Linear</td>
<td>Ionic</td>
<td>Kidney</td>
<td>None</td>
<td>Yes</td>
</tr>
<tr>
<td>MultiHance (gadobenate dimeglumine)</td>
<td>Linear</td>
<td>Ionic</td>
<td>97% Kidney 3% Bile</td>
<td>&lt;5%</td>
<td>Yes</td>
</tr>
<tr>
<td>Primovist (gadoxetic acid disodium salt)</td>
<td>Linear</td>
<td>Ionic</td>
<td>50% Kidney 50% Bile</td>
<td>&lt;15%</td>
<td>No</td>
</tr>
<tr>
<td>Vasovist (gadofosveset trisodium)</td>
<td>Linear</td>
<td>Ionic</td>
<td>91% Kidney 9% Bile</td>
<td>&gt;85%</td>
<td>No</td>
</tr>
<tr>
<td>ProHance (gadoteridol)</td>
<td>Cyclic</td>
<td>Non-ionic</td>
<td>Kidney</td>
<td>None</td>
<td>No</td>
</tr>
<tr>
<td>Gadovist (gadobutrol)</td>
<td>Cyclic</td>
<td>Non-ionic</td>
<td>Kidney</td>
<td>None</td>
<td>No</td>
</tr>
<tr>
<td>Dotarem (gadoterate meglumine)</td>
<td>Cyclic</td>
<td>Ionic</td>
<td>Kidney</td>
<td>None</td>
<td>No</td>
</tr>
</tbody>
</table>

Table: Properties of gadolinium-containing contrast agents and reported cases of NSF.
Extraneal (icodextrin 7.5%) is used as part of continuous ambulatory peritoneal dialysis (CAPD) or automated peritoneal dialysis (APD) for treatment of chronic kidney failure.

Patients who are given Extraneal or other products that contain (or are metabolised to) maltose, xylose, or galactose (eg, the intravenously administered normal human immunoglobulin Octagam) should use only glucose-specific blood-glucose monitors.

Roche’s Accu-Check monitor (a glucose dehydrogenase pyrroloquinolinequinone or GDH-PQQ system) and the glucose-dye-oxidoreductase-based system are not specific for glucose, and false readings are common in the presence of maltose, galactose, and xylose. This interference does not occur when a glucose-dehydrogenase-NAD-based system is used.

Use of the wrong test may cause a falsely high reading of blood glucose, which could result in administration of more insulin than needed and subsequent hypoglycaemia, loss of consciousness, coma, neurological damage, or death. Alternatively, a false reading of high glucose may mask true hypoglycaemia and allow it to go untreated with similar consequences.

Healthcare professionals who advise use of non-glucose-specific blood monitors routinely should identify whether the patient is taking concomitant medication before use, and should inform patients who are given Extraneal or other products that contain (or are metabolised to) maltose, xylose, or galactose to use only glucose-specific monitors to measure their blood glucose.

α-1 adrenoreceptor antagonists: intraoperative floppy iris syndrome

Data have accumulated to suggest that intraoperative floppy iris syndrome (IFIS) is a possible class effect of α-1 adrenoreceptor antagonists, which are used to treat benign prostatic hyperplasia. IFIS is a newly identified syndrome that can lead to surgical complications during cataract surgery.
An association between IFIS and the \(\alpha\)-1 adrenoreceptor antagonist tamsulosin has previously been identified and advice communicated to healthcare professionals.\(^1\), \(^2\) A warning is now being added to the product information for all \(\alpha\)-1 adrenoreceptor antagonists, advising patients to inform their cataract surgeon about past or current use of these medicines before surgery to ensure that appropriate measures are in place should IFIS occur.

Ergotamine dopamine agonists such as pergolide and cabergoline are associated with fibrotic adverse drug reactions and cardiovalvulopathy. Warnings about these reactions were added to all drugs in this class in 2002,\(^1\) and, in 2005, further restrictions were implemented for pergolide (which was thought to have a higher risk of cardiovalvulopathy than other ergotamine agonists). These restrictions included: use in second-line treatment alone or as adjuvant therapy with levodopa; contraindications; warnings; and additional monitoring requirements.

Since then, three studies\(^2\)–\(^4\) have been published on the risk of cardiovalvulopathy with ergotamine dopamine agonists. Evidence confirms that the risk of cardiovalvulopathy is high and clinically significant, and that the risks of treatment with cabergoline or with pergolide are similar.

Prescribing information for the brand leader (Cabaser) and generic products has been updated in line with that for pergolide (Celance). In April, 2007, general practitioners and neurologists received a letter\(^5\) about the updated advice:

- The indication for cabergoline has been restricted to second-line treatment in patients who are intolerant, or do not respond, to treatment with a non-ergot compound. Cabergoline can be given in this restricted setting as monotherapy or as an adjunct to levodopa plus dopa-carboxylase inhibitor
- Cabergoline is contraindicated in patients with a history of pulmonary, pericardial, or retroperitoneal fibrotic disorders, or in those with anatomic evidence of cardiovalvulopathy
- Monitoring for development of valvular disease or fibrosis is recommended. Echocardiography should be done within 3–6 months of starting treatment, and should be done at least every 6–12 months thereafter

Prescribing information for cabergoline (Dostinex) for the management of endocrine disorders is currently under review.
Dopamine agonists: pathological gambling, increased libido, and hypersexuality

Keywords: Dopamine agonists, Parkinson's disease, pathological gambling, increased libido, hypersexuality, class effects

Compulsive behaviour with dopamine agonists may be dose-related

Dopamine agonists (e.g., apomorphine [APO-go], bromocriptine [Parlodel], cabergoline [Cabaser, Dostinex], levodopa, pergolide [Celane], piribedil, pramipexole [Mirapexin], quinagolide [Norprolac], and ropinirole [Adartrel\(^\downarrow\), Requip]) are used in the management of patients with Parkinson's disease; other uses include restless legs syndrome and endocrine disorders.

Evidence from spontaneous adverse reaction reports and the literature\(^1,2\) suggest that pathological gambling and increased libido, including hypersexuality, may be rare class effects of dopamine agonists.\(^3\)

Product information for medicines that contain dopamine agonists or levodopa, or both, is being updated to include the following wording:

- **Special warnings and precautions for use:**
  Pathological gambling, increased libido and hypersexuality have been reported in patients treated with dopamine agonists for Parkinson's disease, including <Product/Drug name>

- **Undesirable effects:**
  Patients treated with dopamine agonists for treatment of Parkinson's disease, including <Product/Drug name>, especially at high doses, have been reported as exhibiting signs of pathological gambling, increased libido and hypersexuality, generally reversible upon reduction of the dose or treatment discontinuation.

Healthcare professionals are advised to warn patients about these possible side-effects, and to inform patients to seek help from their doctor if they, their family, or their carer notice that their behaviour is unusual.

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Linezolid: restricted indication

Keywords: Restriction of indication, linezolid, oxazolidinone antimicrobial, pneumonia, infections, Gram-positive

Linezolid is not active against infections caused by Gram-negative pathogens, and treatment should be started only after specialist microbiological advice

Linezolid (Zyvox\(^\downarrow\)) is an oxazolidinone antimicrobial, which selectively inhibits bacterial ribosomal translation; it also acts as a reversible monoamine oxidase inhibitor. Linezolid is indicated for treatment of nosocomial pneumonia, community acquired pneumonia, and complicated skin and soft tissue infections. Clinical efficacy has been shown for the Gram-positive aerobes *Enterococcus faecium*, *Staphylococcus aureus*, *Streptococcus agalactiae*, *Streptococcus pneumoniae*, and *Streptococcus pyogenes*. 
**Antidepressants: suicidal behaviour**

**Keywords:** Selective serotonin reuptake inhibitors, antidepressants, suicidal outcomes, young adults, monitoring

Young adults on antidepressant treatment should be monitored closely

The US Food and Drug Administration (FDA) has completed a review of selective serotonin reuptake inhibitors (SSRIs) and related antidepressants on the risk of suicidal outcomes compared with placebo in double-blind, randomised, placebo-controlled trials of adults.

The overall conclusions of the review are consistent with those of the UK and EU—ie, that adult trial participants who receive SSRIs or related drugs are not at overall increased risk of suicidal thoughts or behaviour compared with those who receive placebo. However, the US review lends support to the concern that young adults (ie, those younger than 25 years) may have increased risk of suicidal behaviour.
The safety of all antidepressant medication remains under continuing review in the UK and EU. Product information is being updated to reflect the most recent data for the increased risk of suicidal thoughts or behaviour in young adults, and to reinforce the need for monitoring of patients for any clinical worsening, suicidal thoughts, or unusual changes in behaviour—particularly early on during treatment and around the time of dose change.

Yellow Card reporting of suspected adverse drug reactions remains an integral part of UK pharmacovigilance activities. Yellow Cards are a vital way of identifying potential safety signals associated with the use of licensed medicines. We are particularly interested in receiving Yellow Cards that report serious adverse drug reactions, or that report any reaction for a medicine that is new to the market and carries a black triangle.

Between January and May, 2007, the Commission on Human Medicines/MHRA received 6586 Yellow Cards (see figure), a decrease of 4% compared with the same period in 2006. 64% of Yellow Card reports received to date in 2007 are classed as serious.

Since the launch of a pilot scheme for Yellow Card reporting by patients in January 2005, we have received 5563 reports. For the UK-wide pilot, improved Yellow Cards were distributed to pharmacies, GP surgeries, and other NHS outlets in the UK. Patients can also report online at http://www.yellowcard.gov.uk, or can call the Yellow Card hotline on 0808 100 3352 weekdays 10 00 h to 14 00 h.

Since the launch of online reporting in 2002, 3815 electronic Yellow Cards have been received.

The MHRA continuously seeks to strengthen reporting to the Yellow Card scheme to ensure effective pharmacovigilance. At present, a long-term strategy to strengthen Yellow Card reporting by healthcare professionals and patients is under development. This strategy will focus on promotion and education about the scheme, and investigation of how to facilitate and motivate submission of reports. Further information will be given in this bulletin as the strategy is rolled out.
Isotretinoin for severe acne: access arrangements

The prescribing of isotretinoin (brand leader Roaccutane) for the treatment of severe acne has been restricted to dermatologists since it was first authorised in the UK. Because of its known teratogenicity, additional precautions were introduced in 2005 for female patients through the Pregnancy Prevention Programme.

Given the availability of new generic isotretinoin products, it is important to ensure that healthcare professionals who prescribe and dispense isotretinoin are fully aware of these controls, particularly in light of a change to the Summary of Product Characteristics as a result of a European review.

The Marketing Authorisations or licences for isotretinoin products currently state that it can be prescribed by, or under supervision of, “physicians with expertise in the use of systemic retinoids”. In the UK, this definition refers to consultant dermatologists.

Isotretinoin should be prescribed only by a consultant dermatologist-led team, and prescriptions should be issued under the consultant’s name from a hospital-based pharmacy. This way, specialists with the most experience can advise patients about the important safety issues associated with isotretinoin.

Further information about the prescribing restrictions and key safety issues associated with the use of isotretinoin are available on the MHRA website.

Smoking-cessation aids

After the introduction of a ban in England on July 1, 2007, public places in the UK are now smoke-free. To coincide with this important date, we have published an overview of smoking-cessation aids on our website. This information covers the types of aids available, including nicotine-replacement therapy and prescription medicines, and discusses their side-effect profile such that people (alongside healthcare professionals) can make an informed decision about a suitable method to help give up smoking.

Varenicline (Champix) is a prescription-only medicine that was approved in the EU in September, 2006, as a stop-smoking aid for adults. Because varenicline is a new drug and information about its use in the population is limited, healthcare professionals and patients are encouraged to report any side-effects thought to be associated with varenicline use via the Yellow Card scheme.
Recent letters to healthcare professionals

Recently, letters were sent to healthcare professionals to inform them of updated safety information for: Adcortyl/Kenalog injections (adverse eye reactions after unapproved intraocular administration); bevacizumab (Avastin\textsuperscript{\textregistered}, occurrence of tracheoesophageal fistula in a study assessing an unapproved indication); somatropin (Genotropin; calculators may overestimate body surface area) and rimonabant (Acomplia\textsuperscript{\textregistered}, contraindication in patients with depression).

Drug alerts

In June, 2007, an alert was issued for Viracept (nelfinavir) because of contamination with a genotoxic carcinogen of the active ingredient used in all preparations. All stock has been recalled, and patients changed to an alternative HIV treatment. Drug alerts have also been issued for some parallel-distributed stocks of Plavix (clopidogrel) and for some stocks of Casodex (bicalutamide) after identification of counterfeit tablets.

Other information from the MHRA

Enforcement

The MHRA’s enforcement and intelligence group conduct investigations and prosecutions to enforce medicines legislation in the UK. In early 2007, prosecutions were made relating to the illegal sale of Kamagra, which was found to contain sildenafil, via the internet.

Advertising

The MHRA’s Advertising Standards Unit scrutinises promotional material about medicines. Anyone who has concerns about misleading advertising for medicines can contact us through our website. Past investigations by the Unit are also published here.

Consultations

We have recently carried out a consultation exercise on proposals to restrict the availability of medicines that contain pseudoephedrine and ephedrine by a switch from P to POM and by a restriction in pack sizes. These proposals are being made in response to reports of misuse of these substances in the manufacture of the class A controlled drug methamphetamine.

We have sought views on the reclassification of 250 mg naproxen tablets from POM to P availability for 3 days’ use for dysmenorrhoea, and we have consulted on a reclassification of azithromycin for treatment of chlamydia from POM to P availability.

Read more about the Commission on Human Medicines including summaries of minutes from meetings, at http://www.mhra.gov.uk/mhra/CommissiononHumanMedicines

Copies of this bulletin can be downloaded at http://www.mhra.gov.uk/mhra/drugsafetyupdate