Aluminium-containing transdermal patches: a risk of burns

- The waterproof outer layer protecting some transdermal patches is composed of aluminium. This creates a risk of burns, especially when the patient is exposed to electric shocks or intense magnetic fields.

- External electrical shocks delivered by a defibrillator for example can create electrical arcing between the electrode and the aluminium layer of the patch, potentially causing burns.

- During Magnetic Resonance Imaging (MRI) the aluminium present in these patches, which is not ferromagnetic, creates electrical resistance (by induction), and can sometimes cause second-degree burns.

- Patients undergoing MRI or defibrillation on patients ing.

- Several authors have reported explo-

- MRI: risk of burns by induction. During MRI, metallic objects with ferromagnetic properties within the perimeter of the magnetic field are violently drawn to the MRI device and can injure the patient (4).

- The radiomagnetic waves created by an MRI unit can also induce electrical currents capable of heating an implanted metallic device, justifying certain contra-indications for MRIs (5,6).

- The aluminium present in some patches is not ferromagnetic but acts as an electrical heating conductor (7). Reports in the United States mention second-degree burns in patients wearing aluminium-containing patches during MRI (8-10).

Caution needed to prevent burns. Several ranges of transdermal patches containing a protective aluminium layer are marketed in France, including Nitriderm TTS® (trinitrine), Scopoderm TTS® (scopolamine), and Neupro® (rotigotine) (b).

- Unless one is sure that a transdermal patch does not contain conductive material, it is best to remove it before MRI and, if circumstances allow, before external defibrillation (8-12). The patch should then be reapplied or replaced, according to the basic rules for handling patches (espe-

- The presence of an aluminium layer is not clearly mentioned on the labeling, but it can generally be detected simply by examining the adhesive surface: if it is shiny and reflects light, the patch contains an aluminium layer.

Action. Transdermal patches containing conductive materials such as aluminium require special precautions compared to patches not containing these materials (16).

- It may not be easy to remember this in emergency situations; patients and care-givers would therefore benefit from a clear printed warning.

References

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here is a risk of burns with trans-

dermal patches containing an alu-
nium layer, especially when the patient is exposed to an electric shock (defibril-

ation) or an intense magnetic field (a). Precautions must therefore be taken dur-

ing external electric shock therapy and Magnetic Resonance Imaging (MRI).

Defibrillation: risk of electrical arcing.

Several authors have reported explo-
sions, with detonations, flashes or smoke, during external defibrillation on patients wear-
ing patches on their torso (1-3). One patient had first-degree burns (3).

Similar cases have been reported with trinitrine ointments (alias nitroglycerin) and with some gels for electrodes (1,2).

In these cases, however, experiments showed that the explosive phenomena were due to the conductive nature of the ex-ceptant (1,2). They were caused by elec-

trical arcing between the paddle of the external defibrillator and the aluminium layer of the patch (1-3).

The warning on Nitriderm TTS® patch leaflets, which contain trinitrine, makes sense. However, there is no need to extend the same warning to patches without an aluminium layer since trinitrine is not implicated, as the phenomenon is electrical, not chemical.

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