Physician administered sedation for DC cardioversion

S J Harrison, J Mayet

Providing anaesthetic cover for DC cardioversion can sometimes prove a challenge for the cardiologist, with potentially disastrous consequences for the patient.

External DC (direct current) cardioversion for atrial tachyarrhythmias is a common cardiological procedure that has traditionally been performed with the patient under general anesthesia. However, organizing anaesthetic cover for a cardioversion can sometimes be a challenging experience for the cardiologist. He/she often has to coordinate their own availability with: a starved patient, a coronary care nurse, an anaesthetist, and a trained anaesthetic assistant. This process is time consuming and may be frustrating for staff and patients when delays are encountered, and can lead to longer hospital stays with cost implications. Physicians in a variety of specialties have experience in providing safe sedation for unpleasant procedures in accordance with the many guidelines now available. In cardiology, the widespread use of transoesophageal echocardiography has led to familiarity in the administration of sedative drugs.

In response to the difficulties in arranging anaesthetic cover there has been a resurgence of interest in physician administered sedation for external DC cardioversion. Two groups have recently described their experiences in this journal using benzodiazepines with opiate supplementation as required, and have concluded that this was a safe and effective method of performing cardioversions. These studies were performed with appropriate monitoring and resuscitation equipment for sedation and report no serious adverse events. However, the studies were underpowered to provide reassurance for this technique (149 and 141 patients enrolled), and raise a number of concerns.

LEVEL OF SEDATION
The first issue relates to the level of sedation required for this procedure. External DC cardioversion may be a brief procedure, but is profoundly stimulating and needs anaesthesia and not merely sedation to obviate stress responses effectively and prevent recall. The pain level for external cardioversion can be equated to that of electroconvulsive therapy—which is of a similar brief duration and for which a short general anaesthetic is also given. Electrophysiology procedures and transoesophageal echocardiography are lengthier, and sedation is to reduce discomfort and allay anxiety rather than to produce anaesthesia. In the two recent studies published in this journal an unusually deep level of sedation was induced to prevent recall, as indicated by loss of eyelash reflex or a Ramsay sedation score of 5 (described as a sluggish response to light glabellar tap or loud auditory stimulus). In fact, most of the patients in these studies could be described as being in the light planes of anaesthesia. This distinction has also been highlighted in the Practice guidelines for sedation and analgesia by non-anaesthesiologists. They define sedation and analgesia as a state that allows patients to tolerate unpleasant procedures while maintaining adequate cardiorespiratory function and the ability to respond purposefully to verbal command and/or tactile stimulation. They suggest that patients whose only response is reflex withdrawal from a painful stimulus are sedated to a greater degree than encompassed by sedation/analgesia—in other words, they are anaesthetised.

This leads on to the second concern, which is one of airway safety. It is in the light planes of anaesthesia that airway difficulties are most commonly encountered such as laryngospasm, coughing, bronchospasm, and subsequent hypoxia. Laryngospasm results from a predominance of adductor muscle tone of the vocal cords. If severe—with complete apposition of the vocal cords—there will be complete airway obstruction. This can usually be overcome by skilled airway management, and with either deepening or lightening the level of anaesthesia, but on occasion specific anaesthetic drugs such as suxamethonium (a fast acting muscle relaxant which blocks the spasm) are required. It is the unpredictability of heavy sedation/light anaesthesia that makes anaesthetists reluctant to offer sedation without a trained anaesthetic assistant and full anaesthetic equipment at hand. In fact it is often safer to opt for anaesthesia from the start and guarantee better airway control, especially in children, smokers, the obese, and patients with obstructive sleep apnoea.

HYPERCAPNIA
A third concern is that of hypventilation and carbon dioxide retention. Intravenous anaesthetic induction agents, benzodiazepines, and opioids all cause dose related respiratory depression and eventually apnoea. Pulse oximetry measuring oxygen saturation is a monitor of hypoxia, but provides no information as to the level of arterial carbon dioxide. It is easy for inadequate ventilation (and therefore a climbing PaCO₂) to be masked if the patient has supplementary oxygen. It is not suggested that supplementary oxygen should not be used, as avoiding hypoxia is vital. However, it should be recognised that when a longer duration and deeper level of sedation is used patients are likely to become significantly hypercapnoiec, which may in itself precipitate...
Quinine

Cinchona officinalis (family Rubiaceae) is a tree from the Andes whose bark contains the alkaloids quinine and quinidine. “Jesus’s bark”, as it was called, was discovered in Europe after 1630 to be valuable in treating malaria. It also became widely used for fevers in general, and in 1749 de Senac found by chance that “Long and rebellious palpitations have ceded to this febrifuge”. The alkaloids had been isolated by 1860 but their proven use in arrhythmias came about only because of the astute observation in 1912 of a Dutchman with attacks of palpitation who had found for himself that he could halt an attack when he took 1 g of quinine. Probably he took quinine for malaria. He was a patient of Professor Karel Wenckebach who confirmed paroxysmal atrial fibrillation and found quinidine was the most effective. In 1920 Thomas Lewis pioneered the use of chest leads to record precisely the atrial rate in atrial fibrillation and showed that it was slowed by quinidine. Referring to his hypothesis of circus movement Lewis proposed the use of chest leads to record precisely the atrial rate in atrial fibrillation and showed that normal rhythm was restored because quinidine closed the gap between the crest and the valley of the circus wave.

Cinchona belongs to the huge family Rubiaceae that has over 10 000 species worldwide, but emetine from ipecacuanha and caffeine from coffee are the only other drugs within it. It contains the beautiful shrub Gardenia named by Linnaeus to honour the Scotsman Dr Alexander Garden (1739–1821) of the beautiful shrub Gardenia named by Linnaeus to honour the Scotsman Dr Alexander Garden (1739–1821), who was a physician and botanist in Charleston, South Carolina around 1780. The stamp showing Cinchona officinalis came from the United Nations (Geneva Headquarters) in 1990 as part of the set depicting medicinal plants.

References


Physician administered sedation for DC cardioversion

S J Harrison and J Mayet

*Heart* 2002 88: 117-118
doi: 10.1136/heart.88.2.117

Updated information and services can be found at:
http://heart.bmj.com/content/88/2/117

These include:

**References**
This article cites 7 articles, 2 of which you can access for free at:
http://heart.bmj.com/content/88/2/117#BIBL

**Email alerting service**
Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

Notes

To request permissions go to:
http://group.bmj.com/group/rights-licensing/permissions

To order reprints go to:
http://journals.bmj.com/cgi/reprintform

To subscribe to BMJ go to:
http://group.bmj.com/subscribe/