Physician administered sedation for DC cardioversion

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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 anaesthesia. However, organizing anaesthetic cover for 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 opiates 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 the 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 obtund stress responses effectively and prevent recall. The pain level for cardioversion is often 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 hyperventilation 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 are used patients are likely to become significantly hypercapnoeic, which may in itself precipitate
arrhythmias and deepening coma. In anaesthetic practice, spontaneously breathing anaesthetised patients routinely have their end tidal carbon dioxide levels monitored, and management instigated to prevent dangerous levels of hypercapnia developing.

The routine use of flumazenil to reverse benzodiazepine is worthy of comment. Patients run the risk of becoming resedated when the half life of the benzodiazepines given outlasts that of flumazenil.9 10

Although superficially attractive, benzodiazepines with or without opiates are not the ideal drugs for use in external DC cardioversion. An intravenous induction agent such as propofol is a much better choice because it has rapid onset, obtunds cardioversion. An intravenous induction agent such as propofol does produce dose dependent hypotension more notably in elderly and dehydrated patients, but this can be limited by slower administration and careful titration in more susceptible patients.

In conclusion, the elective cardiovascularly stable patient for external DC cardioversion needs to be deeply sedated or anaesthetised. Conscious sedation is only appropriate for other less painful procedures. The new report on Implementing and ensuring safe sedation practice11 is very clear in its recommendations on conscious sedation. It states that if verbal responsiveness is lost the patient requires a level of care identical to that needed for general anaesthesia. The problem is that anaesthetic/sedative emergencies are relatively rare and it is easy to be lulled into a false sense of security. Emergencies, when they do occur, can lead to serious consequences if not dealt with using appropriate speed by personnel with appropriate airway skills. Cardiologists should work with their anaesthetic colleagues to get more readily available anaesthetic cover for these procedures rather than offering a suboptimal service that may lead to the occasional disaster. Regular, formal day case lists with appropriate anaesthetic and recovery staff is the ideal solution, with flexibility from all concerned to accommodate urgent cases.

References


STAMPS IN CARDIOLOGY

Quinine

Cinchona officinalis (family Rubiaceae) is a tree from the Andes whose bark contains the alkaloids quinine and quinidine. “Jesuit’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 Jonnay developed quinine from ipecacuanha and caffeine from coffee are the only other drugs within it. It contains the alkaloid quinine which 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.

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

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