Critical Care and Resuscitation 1998; 1: 324-325

Correspondence

Magnesium, malignant hyperpyrexia and a veterinary experience

On noting the article on intravenous magnesium in the June edition of *Critical Care and Resuscitation*, and the reference to its use in malignant hyperpyrexia,[1] I thought the following story may be of interest to your readers.

Some years ago, it occurred to me that maintenance of body heat and sudden rapid rises in body temperature, were probably the result of muscle activity (where else can you get a large scale breakdown of ATP in a short period of time?). As muscle contraction requires Ca^{2+} and muscle relaxation requires Mg^{2+}, it seemed to follow that if malignant hyperpyrexia was due to abnormal muscle contraction, then Mg^{2+} should correct it.

My brother, who happens to be a veterinary surgeon, often calls me for resuscitation advice in respect to animals. One night, he rang and asked if I knew anything about malignant hyperpyrexia as he had a moribund dog with that condition at the time. Grasping the opportunity, I suggested that he might try intravenous magnesium sulphate at a dose of about 0.1 - 0.3 grams slowly for the 20 kg dog. Having not heard back from him by next morning, I decided to ring him back to find out what had happened. He said that he was quite amazed at the result. Within an hour, the dog had stopped its diarrhoea (which is apparently a common symptom of hyperpyrexia in dogs), its temperature had begun to drop, and this morning was bouncing around the kennel as if nothing had happened. In his previous experience, all dogs that had had the disease had subsequently died. As a result of this, he had rung a colleague who worked around the Murray River district and asked if he used Mg^{2+} for any forms of hyperpyrexia. "We use buckets of it for milk fever in cows, mate", was the reply.

However, the term 'milk fever' is probably misleading. After the cows 'drop their calves' in spring they are often put out into the lush spring pasture - which happens to be severely deficient in Mg^{2+}. Thus, it is the Mg^{2+} deficiency and not the fact that the cows are giving milk that causes the fever and tetany of 'milk fever'.

Another interesting thing about magnesium is that cells seem to need it in order to retain potassium. Is magnesium deficiency therefore a factor in 'muscle melt-down' in athletes?

I feel that there is a real opportunity to investigate the relationship between Mg^{2+} and body temperature. Magnesium sulphate is certainly cheaper and more readily available than dantrolene.

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"Shh! I think it's the patient" - again

What an interesting coincidence that my faithful postman should deliver on the same run the recent June issues of Critical Care & Resuscitation and BMJ featuring leading editorials which touched on something close to my heart.[1-3] I can still vividly remember being intoxicated by the emotional cocktail of relief and disbelief, ecstasy and shock on that fateful day in June 1991 when my cerebral cortex received signals from the retinae, having extracted my name from the Finals Candidate Pass List!! *"Wow...then whoops...what can this mean? How am I supposed to conduct myself now?"*

The internship year was like a bungy-jump and how I survived it remains a miracle and a mystery, since, as medical students, we are not really emotionally-prepared for what was to come, with no rehearsal for the role. The daily clinical task of decision-making at the bedside is based on our pool of knowledge (product of the undergraduate curriculum and current evidence-based medicine), with a splash of good old-fashioned common sense, a sprinkle of moral value, plus a dash of professionalism (re: the Hippocratic Oath). Remember, *primum non nocere*.

The journey through postgraduate training is tantalizing but rewarding at most times, and all of us will have acquired an album of 'memorable experience, people who changed my practice'. Some of us will recall this comment: *"Gee, Doc, dunno how you do it? I suppose you must be used to seeing dead and dying people all the time!"* uttered usually at the 'breaking of bad news' gathering. It saddens me that such imagery is projected, and it's particularly disheartening under such circumstances. The answer is *"WE DON'T!"* Different individuals have different coping mechanisms - some choose to talk, whilst others grieve in secret; some even deny, whilst others 'drown it down' with a beer (or two...)!! One thing for sure, is that we too have

feelings....of being cheated of life, and one can never (or at least I hope we never would) be desensitized to death and the dying despite its inevitability.

The human body is the most incredible creation in this universe with remarkable potentials to survive all forms of noxious physical insults, but the human soul is vulnerable to a complex menagerie of thoughts and feelings. As physicians, it is our duty to ensure adequate relay of information to the patient; and as fellow human beings, to do so with respect and empathy. Spending time with the patient should not be viewed as a perturbation but as a channel into the patient's inner world of turmoil and to defuse some of the anxieties and fears, self-doubt and confusion; and try to inject some sense of well-being, worthiness, self-belief with perhaps an element of hope.

In the modern world of ever-advancing science and technology, we find ourselves challenging the meaning of death. Patients mechanically ventilated, pharmacologically sedated and physiologically supported are still humans and just as receptive to that heart-warming touch, the caring voice of address and words of reassurance as our awake patient. And don't forget the family who has to watch quite helplessly their loved one, buried amongst the drips, pumps, lines, tubes and drapes whilst slipping down a road of uncertainty; their breaths and heartbeat drowned by the sounds of ventilators, beeps and alarms. A few minutes to explain and update are always welcomed and appreciated.

So, let's get off our 'medical high-chair' and sit ourselves at the same bench beside our patients, and try and see the world at that angle.

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