Occasional essay

Are intensive care units self-sustaining?

Finally, we had reached the last patient of our morning ward round - a round that had been interrupted by trying to accommodate a request for three beds for patients from cardiothoracic theatre, an accident and emergency department trauma call and a cardiac arrest. The night registrar looked somewhat relieved as he knew that his shift was about to end. He quickly ushered us to the foot of the bed and began by telling us that the patient had been admitted for postoperative management following a defunctioning colostomy for a bowel obstruction caused by a rectal carcinoma. It was an elective admission, as the patient had been admitted previously to the intensive care unit (ICU) about 2 weeks ago with shock and acute respiratory failure caused by an E. coli septicaemia.

I recalled the patient's former admission and remember thinking at the time that much of his respiratory failure had probably been caused by a generous infusion of colloid and crystalloid solutions prescribed by our junior medical trainee in an attempt to generate a mean arterial pressure of 85 mmHg; a pressure deemed necessary to 'guarantee adequate perfusion and reduce the risk of acute renal failure'. I also recalled that after ceasing the morphine and midazolam infusion, reducing the mean arterial pressure lower limit to 65 mmHg and attaining a large negative fluid balance, the patient was able to be extubated successfully without developing acute renal failure, although 4 days had elapsed before this was achieved.

The rectal carcinoma associated with his E. coli septicaemia was diagnosed during his ICU stay. As the tumour was not obstructing the bowel lumen, a course of radiotherapy following his discharge from the ICU, was planned to reduce the tumour mass before definitive surgery. However, during a 10 day delay in arranging radiotherapy, the lesion suddenly became an obstructive one so a defunctioning colostomy was performed and he was electively readmitted to the ICU on the evening of his surgery for further management.

The patient remained intubated throughout the night with an infusion of morphine and midazolam (50 mg of each in a 50 mL syringe) to settle him. The infusion initially ran at 4 mL/hr which was rapidly increased up to 10 mL/hr. A mean arterial blood pressure lower limit of 85 mmHg was again prescribed and 3.0 L of 0.9% saline, 1.5 L of 4% albumin in 0.9% saline, 1 L of Gelofusine®, two units of blood, 850 mL of fresh frozen plasma and finally a noradrenaline infusion (increasing up to 25 μg/minute) had been administered throughout the night. At the morning ward round the patient was on 100% oxygen and 15 cm H_2O of PEEP with a PaO_2 of 82 mmHg.

"A 'Swan' has not been inserted?" I inquired.

The night registrar looked around for some support from his colleagues. "Well as there have been no controlled trials showing any benefit with right heart catheterisation, and some even indicating an increase in morbidity with its use, I guess I felt that it would be better to manage him without one", he responded.

"So you used blood pressure only to assess the adequacy, or otherwise, of the circulation?" I asked.

"Yes - along with urine output and other signs" he nodded.

"Such as?" I inquired.

"Capillary return, triple rhythm, pulmonary crepitations" he replied, nodding again.

It was the at end of a long ward round and I didn't wish to denigrate the importance of physical signs particularly when they seemed to be so enthusiastically promoted by a junior registrar (especially as some of our medical trainees seem to manage patients from a biochemical result book and a radiological screen rather than from the bedside), nevertheless I felt compelled to travel a little further with the conversation.

"Has the stethoscope undergone a prospective, randomised and controlled trial?" I asked.

The registrar began to shuffle.

"What about the percussion hammer, tuning fork, ophthalmoscope or even the palpating hand?" I was on a roll "and why a mean arterial pressure of 85 mmHg. Why not 105 mmHg?"

The registrar looked a little confused as he probably wondered why I was challenging the subject of physical signs, particularly as I often strongly endorsed the use of the clinical examination and often tried in vain to reintroduce its benefits to the consciousness of trainees. Moreover, wasn't the maintenance of blood pressure important?

"Gentleman….and Madam" I uttered, as there was also a young female trainee in our midst who was desperately trying not to catch my eye.

"I am not anti-clinical examination, I am just anti-'knee-jerk' medicine, anti-thoughtless medicine, call it what you like. The circulation is not just about arterial pressure it is about preload and flow. The Swan is *our* instrument. We should be experts in its use and abuse. This patient has a bad case of iatrogenic pulmonary oedema and has had the misfortune of having had it twice in 2 weeks" I said in exasperation.

There was no reply. Indeed the only sound that could be heard was the gentle hiss of the ventilator.

I turned to the ‘day’ registrar and said “Insert a ‘Swan’ and let me know the results” and left.

A right heart catheter was inserted revealing a wedge pressure of 28 mmHg a cardiac output of 12.5 L/min (CI 6.0 L/min/m^2) and mixed venous oxygen saturation of 82%. The patient underwent another trial of re-emergence - ceasing the morphine and midazolam, reducing the mean arterial pressure lower limit to 65 mmHg and (with the help of frusemide) inducing a large negative fluid balance. The patient was subsequently extubated, although this time it required only 2 days.

As I related the story to my colleagues I remember lamenting the fact that it wasn’t the Swan-Ganz catheter that was at fault, it was unidimensional thinking and protocolised or ‘knee jerk’ medicine that were the new weapons of mass destruction. That evening my wife was more understanding saying that young trainees were there to be taught and they will make mistakes. As I looked at the bottom of my glass containing the last few drops of a ‘cask’ Shiraz, I became somewhat pragmatic “Why should I complain?” I thought “My job is assured”.

“If you have an important point to make, don't try to be subtle or clever. Use a pile driver. Hit the point once. Then come back and hit it again. Then hit it a third time--a tremendous whack.” Winston Churchill

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