Critical care nephrology: the time has come

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Introduction

The last 20 years have seen major changes in the practice of medicine. A particular striking development has been the arrival in the western world of the intensive care unit. Initially sustained by emerging mechanical ventilation technology and the part-time dedication of interested anaesthesiologists, it has gone on to become an established feature of all tertiary institutions, with dedicated and trained specialists, an expanding specific knowledge base, and ongoing research unique to its needs.

Intensive care medicine, or critical care medicine to use an American expression, is now a vibrant and young but well-established medical speciality with specific therapies, publications, practical and cognitive skills, and associated procedures. The development of intensive care units has, in particular, had major implications for the kind of surgery that can be performed routinely (coronary artery bypass surgery) and for the kind of patients (elderly and with significant chronic diseases) that can be successfully treated. The evolution of intensive care medicine has also had significant implications for clinical nephrologists. One major implication has had to do with the nature, epidemiology, and management of severe acute renal failure (ARF).

Severe ARF is now profoundly different in its epidemiology and associations from the disease seen by nephrologists 30 years ago: it is seen predominantly in intensive care units [1,2], it is usually associated with the dysfunction of other organ systems [2], it is often accompanied by sepsis, it is typically multifactorial, and it has a very high mortality.

Management of this type of acute renal failure demands the application of complex knowledge and skills that are normally not fully acquired either as part of standard training in intensive care medicine or as part of standard nephrological training. Such knowledge and skills can only come from either a multidisciplinary approach in which nephrologist and intensivist work side by side to achieve optimal care for a given patient, or from specialists originally from either field who have gone on to formally acquire expertise and training in both specialities.

In either case, as we will argue here, the formal development of a speciality area called Critical Care Nephrology is something whose time has come.

Past and present problems

The changes in the epidemiology of severe ARF, which now make it a disease of critically ill patients, have developed over the last two decades and it may be surprising to the unbiased observer that talk of specialization in 'critical care nephrology' and the concept of multidisciplinary patient care in this area are only emerging now.

There are several structural explanations, however, for the persistent delay in the evolution of medical thought and practice in this area.

The first explanation is of an historical nature: The focus of postgraduate medical training has not typically been multidisciplinary or problem-orientated but rather specialty-orientated. Advanced trainee's interactions usually involve colleagues from the same specialty and frequently lead to the development of an adversarial ‘them and us’ mentality. Thus specialists are consulted for organ- or specialty-related problems, or for the performance of procedures and tests for which they have the required particular skills and are familiar with. Such an approach is often deleterious to patient care, because it leads to fragmentation and conflict. In addition, while some specialists endeavour to take a global view of the patient's condition, their familiarity with intensive care technology, current management, and pathophysiology, is often limited. As a consequence the global perception of the patient that such specialists have is often out of touch with reality. This limited understanding of critical care medicine then results in inappropriate advice to the family, and the insistence on inappropriate therapeutic steps such as the unnecessary prolongation of physical life in hopeless cases. Such action in turn, fuels the fire of antagonism rather than co-operation. The opposite is
also true. It is not uncommon for intensivists to be unresponsive to sound advice from other specialists concerning overall patient management. Some critical care physicians consider themselves the sole repositories of sound haemodynamic and fluid management. As a consequence they often unnecessarily regard useful practical advice from nephrologists. The clash of these 'cultures' has significantly impeded the development of a combined strategy in the management of patients with acute renal failure.

Medical politics is an everyday reality in each and every institution around the world. Issues of power and influence often affect patient management.

Control of patient care defines power within the medical structure for the individual and for the speciality group. In the pursuit of such power, specialists clash instead of co-operating. They seek to exclude each other from patient management to prove that the other is unnecessary, and to increase the perceived need for their services. In addition to such internal struggles, conflicts emerge between hospitals in neighbouring catchment areas with the intent of either demonstrating the absolute need for tertiary services or showing that peripheral hospitals can cope well and cheaply with serious illness.

Financial obstacles also often stand in the way of collaboration.

In health structures where hospital physicians are paid a given salary, there is no financial incentive for additional involvement in the care of complex and demanding patients that often require attention in the early hours of the morning or at weekends. In addition, the need to allocate resources from the nephrology department in order to provide dialytic care to critically ill patients, may unfavourably impinge upon the department’s budget. This may be because inadequate provisions were made for such services when the yearly budget was allocated or because the need to allocate a dialysis nurse to the dialytic care of an ICU patient translates into the inability to provide dialytic care to the scheduled number of chronic haemodialysis patients. In either case, in an environment with finite resources, allegiance to one’s department will profoundly influence therapeutic choices and overall physician behaviour.

The opposite is true in a fee for service environment. Under such circumstances, there is a financial incentive to maintain control of patient care and be recurrently and principally responsible for the prescription and application of all therapies. In this type of environment, collaboration is severely impeded by conflict over patient ‘ownership’, and by attempts to maximize financial returns from patient care to one’s department.

Towards the future

We believe that despite the numerous obstacles that stand in the way of constructive joint care in the management of critically ill patients with acute renal failure, it will become inevitable for a collaborative approach to develop and dominate practice. We believe that things that favour the development of a speciality or a working area of Critical Care Nephrology are too many to be ignored.

Firstly there are scientific reasons for its development. In particular, the knowledge base necessary to offer ‘state of the art’ care for critically ill patients with acute renal failure is rapidly expanding. New publications devoted entirely to renal failure or renal replacement therapy in intensive care are now emerging. The material published in intensive care and nephrology journals on the technology of renal support, the pathogenesis of acute renal failure, and on the therapies available is also rapidly increasing, as journals devote entire issues to these themes [3–5]. It has essentially become impossible for a single individual to possess all the knowledge necessary to provide ‘optimal therapy’.

There are important clinical reasons for collaborative care. Patients with renal failure are significantly more complex than 30 years ago. They almost always are elderly, have significant co-morbidities, and have dysfunction of multiple organs. Renal failure cannot be viewed as a simple problem that will get better over time once the initial insult is gone and sufficient renal replacement therapy has been provided. Insights into such renal replacement therapy now reveal that the therapy itself may make a great deal of difference in the course of the patient illness [6,7].

There also are practical reasons for collaboration and development of a subspeciality area within nephrology and intensive care where the activity both overlap. One of them is the increasing application of continuous renal replacement therapies (CRRT). The use of CRRT has partly redefined the indications for initiating dialytic therapy in the ICU [8]; it has expanded the possible role of blood purification in the management of critically ill patients, and it has widened the scope of interaction between the expertise of the nephrologist, the needs of the intensivist, and their common goals for patient recovery. We believe that these important developments will lead to the perception that attention to common goals and needs eventually yields a level of medical practice superior to that associated with treatments based on the expertise of a single physician. In a collaborative environment, intensivists will stop asking for a nephrological opinion when all ATN has already developed or expect the nephrologist to simply and silently provide a blood purification upon request. Nephrologists will stop thinking that intensive care is just a fancy technological offshoot of anaesthesiology and will stop treating critically ill patients with ARF in the same way that they would treat a patient in the ward.

The reality remains that the critically ill patients keep dying at unacceptable rates. Surely the answer to such a high mortality rate must be that physicians should combine knowledge and expertise, be modest and collegial, be constructive, non-conflictual, and interdisciplinary in their approach to patient care.

We have represented in Figure 1, in a graphic
Fig. 1. A graphic representation of the past (upper panel) and future (lower panel) interactions between nephrology and intensive care medicine in the management of the critically ill patient with acute renal failure.

manner, what we feel the current pattern of nephrology and intensive care practice looks like (upper panel) and what we think it should look like for the purposes of better research and patient care (lower panel).

Critical care nephrology: the structure

As a consequence of what we have been arguing, we believe that in each tertiary institution the following should be incorporated in the structure of training and patient care:

1. All nephrology fellows who intend to be involved in the care of acute renal failure should spend at least a year in an intensive care fellowship programme.
2. All critical care medicine fellows who intend to take an active role in the management of acute renal failure should spend at least a year in a nephrology fellowship.
3. It is desirable, in large institutions, for one or some individuals to have completed a full fellowship in both specialties.
4. A tertiary institution should have a ‘task force’ allocated to the combined management of ARF and to the development of a research programme dealing with multiple aspects of this condition.
5. An integrated critical care nephrology training programme should be made available in large institutions for those who wish to pursue an academic career in this area of medicine.

Conclusion

Our views may be criticized as being overly ambitious and out of proportion to the significance of renal disease in the ICU. With an incidence greater than 20% in the ICU [9], the overwhelming association with multiple organ dysfunction [10,11], the persistent high mortality associated with its development [12], the complexity of the care of such patients, the intricacies of pharmacokinetics in such a setting [13], the evolving nature of renal replacement therapy [14], and the human and financial costs associated with the care of such patients [15], we would strongly argue otherwise. This area undoubtedly needs an injection of focused research, clinical application, and creativity. As has been cogently argued [16], creativity is facilitated by working in completely different domains. Switching fields from intensive care to nephrology or vice versa may represent a powerful way of increasing innovation and providing answers to currently seemingly insoluble problems.

In conclusion, we believe that the time has come for nephrologists and intensivists to join forces in a coherent new academic structure called Critical Care Nephrology. The development of such a true and structured collaborative effort, training, practice, and research is the first necessary step towards improving patient outcome and generating novel therapies and creative new approaches to an area of patient care which badly needs them. The time of such an academic development is now.

References