EDITORIAL

Towards a better outcome of cardiopulmonary resuscitation

The dismal outcome of cardiopulmonary resuscitation (CPR) as reported by Yap et al[1] in this issue of the *Hong Kong Medical Journal* is probably no surprise for hospital doctors who regularly undertake CPR.

In Queen Mary Hospital (QMH), in 2005 we too conducted a retrospective audit of CPR outcomes.[2] In our setting, in the departments of Medicine, Surgery, and Clinical Oncology, CPR was undertaken by doctors of the parent teams (PTs). In other departments and in some designated clinical areas, CPR was undertaken by the Central Resuscitation Team (CRT) comprising of the Anaesthesia or Intensive Care Unit (ICU) Resident, and backup by on-site specialists. A total of 203 CPRs (outside the ICU, operating theatres, and Accident and Emergency Department) undertaken during that year were reviewed. The rate of return of spontaneous circulation (ROSC) was 28% by the PTs and 33% by the CRT (P=0.603); these rates are remarkably similar to the rate of 27% reported by Yap et al.[1] The mean±standard deviation time it took for medical personnel to turn up was 5.3±3.7 minutes by PTs and 7.3±7.4 minutes by the CRT, which is slightly longer or comparable to the 5 minutes reported by Yap et al.[1]

Thus, if the timeliness of initiation of CPR is considered a crucial factor for ROSC, it seems that whatever way resuscitation services are organised, whether by dedicated teams or PTs, there is very little difference in immediate outcomes. More importantly, and as the authors point out, our overall outcomes are probably worse than those reported in many published series. The low survival rate of patients who had arrest rhythms other than ventricular fibrillation (VF) is even more annoying. The latter are actually the vast majority on whom in-hospital resuscitation is now carried out. Clearly, if there is to be any major improvement in the outcome of CPRs, it must be brought about in this patient sector. The value of therapeutic hypothermia for these patients has not been established.[3] Thus, the question is not how to resuscitate, but should they be resuscitated at all. When time allows, the decision on whether to resuscitate or not should be anticipated and discussed. Unpublished data in QMH suggest a rising trend of do-not-resuscitate orders over the past few years, with effective avoidance of 'sham' CPRs.

In which case, if the infrastructure for resuscitation is irrelevant, why are our local outcomes worse? Would more vigilant care in ICUs offer better outcomes? Unfortunately, there have been few recent advances in post-cardiac arrest resuscitation.

In two different studies, therapeutic hypothermia was shown to improve the outcome of patients resuscitated from VF.[4,5] However, the author did point out the low incidence of patients with VF (7.8%) compared to previously reported series. Survival in Yap et al's series[1] of patients with VF was 5/40 (13%) only. Thus, even if therapeutic hypothermia were to be readily available, the impact on the overall outcome would be small.

The low incidence of VF raises the question of a truly low incidence or low rate of pick up. The rate of arrest in monitored beds in Yap et al's series[1] was low (17%), though these patients had a significantly better survival rate. A preventive strategy to provide more monitored beds might be a more effective way of preventing cardiac arrest or detecting and treating it early.

The other similarity between the present study and the preliminary experience in QMH was the time taken for medical personnel to turn up. Thus, in our setup trained medical personnel tended to reach the arrested patient later than in other reported series that achieved a higher hospital survival rate.[6] To overcome this challenge would require empowerment of more ward staff to provide immediate and high-quality resuscitation, and in particular timely defibrillation.

Defibrillation by nurses was practised in some Coronary Care Units (CCU) in Hong Kong and the local experience has been reported.[7] Reducing the time elapsing before shock delivery is the key to successful defibrillation. Practising first-responder defibrillation could be the smart way to shorten the response time to treating VF. However, VF accounts for only a minority of all cardiac arrests. Moreover, the experience of staff outside CCUs or ICUs would be limited. Whether nurses outside the ambit of such units could be trained to defibrillate is not certain. The use of automatic external defibrillators for this purpose could also be looked into.

The American Heart Association revised its guidelines for CPR in 2005,[8] making it easier to perform. There was an emphasis on effective chest compression, with a unified 30:2 compression to ventilation ratio and the use of single shock rather than staggered defibrillation.

Cardiac arrest is similar to other disorders in that it is better prevented than treated, and if treatment is needed, necessary interventions must be initiated early. Prevention and early treatment

probably take precedence over further refinements of dedicated resuscitation teams. All frontline staff should be updated on the current practice of CPR, and in particular about first-responder defibrillation. Competence in performing CPR should be everyone's responsibility.

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