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Letter to the Editor

Feasibility of Tele-ICU augmented cardiopulmonary resuscitation in a resource limited setting: A pilot study

Sir,

Cardiopulmonary resuscitation is a protocol driven procedure and measures such as strict adherence to protocol, minimizing interruptions and ensuring flawless techniques can improve outcomes. The presence of personnel trained in Advanced Cardiac Life Support (ACLS) in the Intensive Care Unit (ICU), which has been shown to improve the survival from Cardiopulmonary Resuscitation (CPR),[1] in low and middle income countries (LMICs) such as India is limited due to several factors including the relatively high cost of the ACLS certification course.[2] An innovative way of bridging this gap is through using Tele-ICU systems which have been shown to be feasible and cost effective in a western setting.[3] A Tele-ICU uses real time audio visual interfaces for the delivery of medical expertise to underserved regions of the world.[4] Here we report our experience with Tele-ICU systems in managing twenty five patients of four separate medical ICUs in India, who had a cardiopulmonary arrest. Our Tele-ICU network, structured as a hub and spoke model, consisted of ACLS trained Tele-ICU nurses and an intensivist at the hub (command center) and a bedside team of nurses and other caregivers who were not trained in ACLS at the spoke ICU. Real time audio-visual feeds from the spoke ICUs to the hub enabled prompt identification of cardiac arrest and initiation of CPR in less than two minutes in all the twenty-five patients. On identification of an arrest, timing of the event,

Table 1 – Comparison of patients who achieved ROSC to those who did not.

	Total (25)	ROSC achieved (9)	ROSC Not achieved (16)	P Value
Age	51.64 (18.97)	46.6 (22.7)	54.5 (16.7)	0.38
Sex				
1. Males	16(64%)	9 (56.25%)	7 (43.75%)	0.02*
2. Females	9 (36%)	0 (0%)	9 (100%)	
Provider which initiated CPR				
1. Physician	4 (16%)	3 (75%)	1 (25%)	0.08
2. Nurse	21 (84%)	6 (28.6%)	15 (71.4%)	0.08
Mean days to code since admission	1.68	1.56	1.75	0.76
First rhythm				
1. VF/Vt	1 (4%)	1 (100%)	0 (0%)	0.17
2. PEA/Asystole	24 (96%)	8 (33.3%)	16 (66.7%)	0.17
Intubated prior to CPR	14 (56%)	6 (42.9%)	8 (57.1%)	0.42
Prior IV pressor	15 (60%)	6 (40%)	9 (60%)	0.61
Duration of CPR				
1. < 10min	7 (28%)	6 (85.7%)	1 (14.3%)	0.004*
2. 11–20 min	3 (12%)	0 (0%)	3 (100%)	0.004
3. 21–30 min	8 (32%)	3 (37.5%)	5 (62.5%)	0.004
4. >30min	7 (28%)	0 (0%)	7 (100%)	0.004
GCS pre-event				
1. Less than 8	15 (60%)	5 (33.3%)	10 (66.7%)	0.73
2. More than 8	10 (40%)	3 (42.9%)	7 (57.1%)	0.73
GCS post-event				
1. Less than 8	7 (77.8%)	7 (77.8%)	–	
2. More than 8	2 (22.2%)	2 (22.2%)	–	

* means the p value given in the cell is less than 0.05 and the difference observed is statistically significant.

identification of rhythm, ensuring timely delivery of medication, shock and proper chest compression was ensured. This resulted in the immediate survival (return and maintenance of spontaneous circulation for more than twenty minutes) of nine patients (36%) which is comparable to the outcomes in western studies on CPR.[5] Additionally, one out of these nine patients survived to be discharged from the ICU (Table 1). The technology may have enabled us to reduce the response time and may have enhanced the performance of the bedside team through explicit clarification of team member roles and streamlining overall team performance. In addition, the expertise of a single trained team at the hub was effectively transmitted to spokes across the country and subsequently translated to satisfactory outcomes. Tele-ICU technology appears to be a safe and potentially cost effective solution to bridge the demand-supply gap of trained personnel at ICUs in LMICs such as India. There is great potential for such technologies to increase the reach of expert teams into the community, however more studies in larger setting have to be done before these can be rolled out at a larger scale.

Disclaimer

The submitted article belongs to the authors mentioned above and not an official position of the institution or funder.

Sources of support

Self funded study.

Conflict of interest statement

The authors whose names are listed above certify that they have NO affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript. DJ and DR are co-directors of Cloudphysician Healthcare and hold equity in the entity.

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Received 23 February 2019

http://dx.doi.org/10.1016/j.resuscitation.2019.02.044