ORIGINAL RESEARCH

An Appraisal of the Current Situation of Out-of-hospital Cardiac Arrest in an Urban South Indian Tertiary Care Hospital: A Registry-based Observational Study

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Abstract

Aims and background: Out-of-hospital cardiac arrest (OHCA) poses a significant global public health challenge, particularly in India where the absence of an official registry complicates understanding the true scope of the issue. This study aims to provide insights into OHCA in South India, focusing on survival rates and key influencing factors, with a specific emphasis on young cardiac arrest patients.

Materials and methods: Conducted as a registry-based observational study in an urban South Indian tertiary care hospital's emergency department, data from January to December 2023 were analysed using the Utstein OHCA registry. Inclusion criteria covered non-traumatic OHCA patients of all ages transported to the hospital.

Results: Among 123 non-traumatic OHCA cases, laypersons performed bystander cardiopulmonary resuscitation (CPR) in 8.1% of cases. The overall survival rate was 0.8%, with a 3.1% survival rate among young adults (18–49 years). Notably, continuous CPR was associated with higher survival rates.

Conclusion: Addressing low survival rates, especially among young individuals experiencing OHCA in India, requires immediate action. Recognising the time-intensive nature of citizen education, our primary recommendation emphasises prompt and targeted, interventions in raising public awareness and training. Placing emergency physicians at the forefront of these efforts allows them to address multifaceted challenges, optimise immediate outcomes and contribute to the continuous improvement of OHCA care in India.

Keywords: Cardiopulmonary resuscitation, Emergency medical services, Extracorporeal membrane oxygenation, India, Observation, Out-of-hospital cardiac arrest, Registries, Survival rate.

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Introduction

Out-of-hospital cardiac arrest (OHCA) presents a formidable global public health challenge, affecting individuals across age-groups.[1] Remarkably, OHCA patients in India exhibit a distinct pattern: They are younger and face markedly lower survival rates when compared to their counterparts in other Asian countries.[2] Recognising the gravity of this issue, our unwavering focus centres on improving OHCA prognosis, particularly among young patients. To tackle this critical problem comprehensively, we established an OHCA registry at our centre. The registry meticulously documents essential details – from the onset of cardiac arrest to transportation, treatment and eventual prognosis. Drawing upon the wealth of data collected through this registry, we aim to provide an insightful overview of the current OHCA landscape in one of South India's largest cities. Our analysis aims to pinpoint existing challenges and propose practical solutions to enhance outcomes.

Materials and Methods

This registry-based observational study took place in the emergency department (ED) of a tertiary care hospital in an urban area in southern India, utilising data from January to December 2023. The hospital is equipped with its emergency transport service, 24-hour cardiac catheterisation capability and an intensive care unit dedicated to post-resuscitation care. To gather comprehensive and standardised data, we established the Utstein OHCA registry, aligning it with the recommendations provided by the International Liaison Committee on Resuscitation.[3] In adapting our registry to our local context, we drew insights from established registries such as the Cardiac Arrest Registry to Enhance Survival[4] and the European Registry of Cardiac Arrest.[5] For successfully resuscitated patients, a comprehensive post-hospital course will be outlined, and outcomes for discharged individuals will be monitored for up to 1 year using the Cerebral Performance Category (CPC) score. Data from patients who experienced cardiac arrest after arrival to the ED has also been studied during the same period for comparison.

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Conflict of interest: None

Inclusion Criteria

Non-traumatic OHCA patients of all ages are transported to our hospital.

Exclusion Criteria

Patients declared dead outside the hospital (e.g., for transportation to the mortuary, presence of rigor mortis).

The study was approved by the Institutional Ethics Committee (12th March 2024, No: SWH/EC/004-2024). Patient confidentiality was safeguarded through a unique identifier and password-protected data entry, accessible solely to authorised users. Data were inputted into Microsoft Excel. Categorical variables were summarised using frequencies and percentages, while continuous variables were presented as median and interquartile range (IQR). We assessed significant differences in the risk ratios for survival to admission and survival to discharge between the two groups using Fisher's exact test. A *p*-value below 0.05 was considered statistically significant. We employed R Software Version 4.3.1, developed by the R Core Team (2021), as our statistical computing environment. Data were reviewed with the responsible physician as needed. Recalled data – additional information obtained subsequently – were added to the dataset, and missing information was marked as "Unknown". Cases with incomplete data for specific variables were included in the registry, preserving the missing data.

Results

Out of the 131 OHCA patients transferred to our hospital from 1 January 2023 to 31 December 2023, a total of 123 patients, excluding 8 cases of traumatic OHCA, were included in the analysis. Details about these 123 non-traumatic OHCA patients are shown in Table 1. Survival to hospital admission was observed in 12 patients, with one patient surviving to discharge (Fig. 1). Among the total 123 patients, only three cases (2.4%) had shockable initial rhythms, while the

Table 1: Characteristics of non-traumatic OHCA patients

Characteristics	*No.*	*%*
Total Non-traumatic OHCA	123	
Age (y), median (IQR)		
68 (47.5–76)		
Age, groups		
0–17	2	1.6%
18–49	32	26%
50–79	74	60.2%
80–99	15	12.2%
Gender		
Male	88	71.5%
Female	35	28.5%
Event location		
Home	95	77.2%
Office	7	5.7%
In transit	6	4.9%
In Ambulance	5	4.1%
Healthcare facility	4	3.3%
Unknown	3	2.4%
Sports ground	2	1.6%
Outside	1	0.8%
Witness		
Seen or heard	91	74%
Unwitnessed	20	16.3%
Unknown	12	9.8%
Bystander CPR		
Yes	13	10.6%
No	110	89.4%
Transportation		
Private vehicle	61	49.6%
Ambulance	52	42.3%
Auto rickshaw	9	7.3%
Carried manually	1	0.8%
Continuous CPR to hospital	9	7.3%
Initial rhythm		
Asystole	116	94.3%
PEA	3	2.4%
pVT	1	0.8%
VF	1	0.8%
AED shockable	1	0.8%
AED non-shockable	1	0.8%
Admission		
Yes	12	9.8%
No	111	90.2%
Survival to discharge		
Yes	1	0.8%
No	122	99.2%
Aetiology		
Unknown	81	65.9%
Cardiac	20	16.3%
Hanging	4	3.3%
Suffocation	3	2.4%
Septic shock	3	2.4%
CVA	2	1.6%
Respiratory	2	1.6%
Poisoning	1	0.8%
Other	7	5.7%

AED, automated external defibrillator; CPR, cardiopulmonary resuscitation; CVA, cerebrovascular accident; IQR, interquartile range; OHCA, out-of-hospital cardiac arrest; PEA, pulseless electrical activity; pVT, pulseless ventricular tachycardia

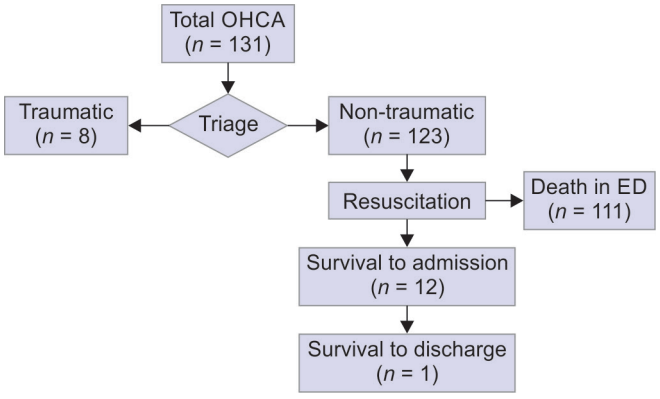

Fig. 1: Flowchart of OHCA patient progression

ED, emergency department; OHCA, out-of-hospital cardiac arrest

Table 2: Details of patients who received any bystander CPR

Age/ Gender	*Location*	*Bystander CPR by*	*Bystander CPR Duration (min)*	*Transported by*	*Continuous CPR to hospital*	*Duration from arrest to hospital arrival (min)*	*Survival to admission*	*Survival to discharge*
66/F	Home	EMT	33	Ambulance	Yes	33	No	No
52/M	Home	Bystander	<1	Private vehicle	No	20	No	No
99/F	Home	Bystander	<1	Ambulance	No	30	No	No
71/M	Home	Bystander	3	Private vehicle	No	23	No	No
89/M	Home	Bystander	Unknown	Private vehicle	No	30	No	No
28/M	Office	Bystander	14	Ambulance	Yes	14	No	No
43/M	Office	Bystander	22	Ambulance	Yes	22	Yes	No
46/M	Office	Bystander	24	Ambulance	Yes	20	Yes	Yes (CPC1)
37/M	Office	Bystander	Unknown	Ambulance	Yes	20	Yes	No
44/M	Sports ground	Bystander	5	Ambulance	Yes	15	Yes	No
37/M	Sports ground	Bystander	20	Ambulance	Yes	20	No	No
23/M	In Ambulance	HCP	20	Ambulance	Yes	20	Yes	No
69/F	In Ambulance	EMT	Unknown	Ambulance	Yes	Unknown	No	No

CPC, cerebral performance category; CPR, cardiopulmonary resuscitation; EMT, emergency medical technician; HCP, healthcare provider

Table 3: Comparison of survival outcomes in non-traumatic OHCA cases

	No. (%)		*Risk ratio (95% CI)*	*p-value*
	Continuous CPR (*n* = 9)	No continuous CPR (*n* = 114)		
Survival to admission	5 (55.6%)	7 (6.14%)	9.05 (3.59–22.8)	<0.001
Survival to discharge	1 (11.1%)	0 (0%)	N/A	N/A
	OHCA (*n* = 123)	CPA in ED (*n* = 18)		
Survival to admission	12 (9.76%)	9 (50%)	0.20 (0.10–0.40)	<0.001
Survival to discharge	1 (0.81%)	3 (16.7%)	0.05 (0.005–0.44)	0.007
	Continuous CPR (*n* = 9)	CPA in ED (*n* = 18)		
Survival to admission	5 (55.6%)	9 (50%)	1.11 (0.53–2.34)	0.55
Survival to discharge	1 (11.1%)	3 (16.7%)	0.67 (0.08–5.54)	0.59

CI, confidence interval; CPA, cardiopulmonary arrest; CPR, cardiopulmonary resuscitation; ED, emergency department; OHCA, out-of-hospital cardiac arrest

majority had non-shockable rhythms. Bystander cardiopulmonary resuscitation (CPR) was performed in 13 cases (10.6%), the details of which are shown in Table 2. This includes bystander CPR performed by emergency medical technicians (EMTs) and healthcare providers (HCPs); excluding these, there were 10 cases (8.1%) of bystander CPR performed by laypersons. Notably, in cases occurring at home, bystander CPR was initiated in 5 out of 95 cases, while co-workers immediately initiated CPR in four out of seven office cases and two out of two at sports grounds. All office and sports ground cases were transported to the hospital by emergency medical services (EMS) while receiving continuous CPR. During the entire study period, the automated external defibrillator (AED) was only employed in two cases in the office – one case activated defibrillation, while the other did not. Out of the 52 cases transported by EMS, only 11 cases (21%) received CPR from EMTs. The initial rhythm was identified in the ambulance in only three cases, all of which exhibited asystole. In the remaining cases, the initial rhythm was determined upon arrival at the hospital. Non-EMS transport modes constituted 57.7%, significantly relying on non-emergency transportation. The time from cardiac arrest to hospital arrival was documented in 86 cases, with a median duration of 41.5 minutes (IQR 30–60).

Among the nine patients who received continuous CPR, meaning CPR was continuously administered without interruption from the scene of the arrest until arrival at the hospital, five (55.6%) survived to hospital admission, and one (11.1%) survived to discharge. In contrast, of the 114 patients who did not receive continuous CPR due to absent or interrupted bystander CPR, only seven (6.14%) survived to admission, and none survived to discharge. The risk ratio (RR) for survival to hospital admission with continuous CPR compared to no continuous CPR was 9.05 (95% CI: 3.59–22.8, $p < 0.001$) (Table 3).

The aetiology encompassed 20 cases (16%) with a cardiogenic cause (including presumed cardiac aetiology) and 81 cases (66%) with unknown causes. The cause was labelled as unknown, except in cases of ST-segment elevation on electrocardiogram after the return of spontaneous circulation (ROSC) or when cardiogenic was strongly suspected, such as in the presence of typical chest pain. Eighteen cases (14.6%) achieved any ROSC lasting 30 seconds or longer, and 12 patients (9.8%) were admitted after achieving ROSC. One patient (0.8%) survived to discharge from the hospital with a CPC score of one at discharge, a status that remained confirmed 6 months later. The median length of hospital stay for these 12 patients was 2.5 days (IQR 1.75–7.0).

In total, 19 patients arrived having visited another healthcare facility. Out of these six were transported by ambulance from the referring unit. Among those, only four were transported by ambulance with continuous CPR in transit. A significant proportion, up to 68%, of patients arrived at our hospital from the previous

Table 4: Details of non-traumatic cardiac arrests in the emergency department

Age	*Gender*	*Initial rhythm*	*Low-flow time*	*Admission*	*Survival to discharge*	*LOS*	*Aetiology*
Subset of patients in whom ROSC was not achieved							
27	M	PEA	N/A	No	No	N/A	Cardiogenic
71	M	PEA	N/A	No	No	N/A	Cardiogenic
73	M	Asystole	N/A	No	No	N/A	Cardiogenic
48	M	PEA	N/A	No	No	N/A	Septic shock
73	M	PEA	N/A	No	No	N/A	Septic shock
70	F	Asystole	N/A	No	No	N/A	Malignancy
78	M	Asystole	N/A	No	No	N/A	Malignancy
86	M	PEA	N/A	No	No	N/A	Unknown
77	M	Asystole	N/A	No	No	N/A	Unknown
Subset of patients who survived to admission							
73	F	PEA	25	Yes	No	3	Cardiogenic
69	F	Asystole	6	Yes	No	9	Cardiogenic
40	M	Asystole	Unknown	Yes	No	5	Cardiogenic
65	M	PEA	3	Yes	No	2	Septic shock
71	M	PEA	8	Yes	No	8	CVA
65	M	Asystole	26	Yes	No	5	Unknown
Subset of patients who survived to discharge							
27	M	VF	10	Yes	Yes (CPC 1)	5	Cardiogenic
63	M	PEA	3	Yes	Yes (CPC 1)	4	Cardiogenic
58	M	Asystole	10	Yes	Yes (CPC 1)	13	Cardiogenic

CVA, cerebrovascular accident; CPC, cerebral performance category; LOS, length of stay; ROSC, return of spontaneous circulation, PEA, pulseless electrical activity; VF, ventricular fibrillation

facility using non-emergency transportation. Four facilities directed the patient to our centre, having noticed a possible cardiac arrest by visual inspection only. These patients were transported by private/public vehicles without any medical attendant accompanying them.

Among the 32 cases (26%) involving young adults aged 18–49 with OHCA, 13 cases were attributed to cardiogenic causes, while 13 others were classified with unknown aetiology. Additionally, there were three cases of hanging, and one case each of Dengue Shock Syndrome, cerebrovascular accident, and poisoning. Of these 13 cases in which cardiogenic causes were suspected, the initial rhythm was ventricular fibrillation and pulseless ventricular tachycardia in one case each, when AED was used, it had delivered shock in one case and not advised shock in one case, the remaining nine cases were all asystole. All 13 cases where the cause of arrest was unknown, exhibited non-shockable initial rhythms. There was only one case with pulseless electrical activity. Seven in the younger age-group survived to admission, with only one among them surviving to discharge, yielding a survival rate of 1 in 32 (3.1%).

During the same period, non-traumatic patients who experienced cardiac arrest in the ED after hospital arrival had significantly higher survival rates compared to those experiencing OHCA. Among the 18 ED cardiac arrest patients, 9 (50%) survived to hospital admission, and 3 (16.7%) survived to discharge (Table 4). In comparison, only 9.76% of OHCA patients survived to hospital admission, and a mere 0.81% survived to discharge. The RR for survival to hospital admission for OHCA compared to ED cardiac arrests was 0.20 (95% CI: 0.10–0.40, $p < 0.001$), and the RR for survival to discharge was 0.05 (95% CI: 0.005–0.44, $p = 0.007$). Notably, all survivors in the ED cardiac arrest group had a CPC score of one at discharge. Additionally, for two of these individuals, we confirmed a CPC score of one even after a 3-month interval, while one survivor was lost to follow-up.

Low-flow duration is defined as the time from the initiation of chest compressions until ROSC is achieved. For the five OHCA patients who received continuous CPR from the scene until arrival at the hospital, the median low-flow duration was 45 minutes (IQR 38–56 minutes). In contrast, for patients who experienced cardiac arrest in the ED, the median low-flow duration was 8 minutes (IQR 3–25 minutes). However, when comparing the two groups, there was no statistical significance in survival to hospital admission or discharge. Specifically, the risk ratio for survival to hospital admission was 1.11 (95% CI: 0.53–2.34, $p = 0.55$) when comparing OHCA patients with continuous CPR to those experiencing cardiac arrest in the ED. For survival to discharge, the risk ratio was 0.67 (95% CI: 0.08–5.54, $p = 0.59$).

Discussion

While there is no official OHCA registry in India, previous reports have shed light on the challenging situation.[6–9] Beyond offering new insights into the constrained non-traumatic OHCA setting, this report emphasises the stark reality of survival rates, with only 0.8% of all cardiac arrests and 3.1% of young adults surviving to discharge. This outcome is markedly lower compared to other reported findings.[1,10,11]

Similar to other registries,[12] the majority of OHCA took place in residential settings, with most of them being witnessed by a layperson bystander, most of the time, a relative. This study found that only 10.6% of OHCA patients received bystander CPR before reaching the hospital. This corresponds with results from prior studies in South India[9] and is significantly below the 40.2% reported in the United States.[10]

Bystander CPR administered by family members was discontinued prematurely, either for transport in a private vehicle

or given up due to a lack of response or simply fatigue. In all the OHCA cases coming from home, we observed that CPR was not continued until the patient reached the hospital. The initial rhythm on arrival identified was asystole in all these cases. This observation is in line with the Indian report, which notes that no patient discovered at home was discharged alive.[13] Conversely, our observations found a significant majority of individuals in office and sports ground settings received immediate bystander CPR. In all these cases, the patients as well as bystanders were in their forties or younger. It suggests that only a small percentage of the population, particularly those in younger age-groups comprehend the importance of uninterrupted CPR. Moreover, it is possible that the office employees had the opportunity to receive education on bystander CPR and have the physical capacity or numbers in the form of other colleagues to respond to a cardiac arrest scenario.

It should be noted that 42.3% of the OHCAs came by ambulance, however only 21% were administered CPR and an initial rhythm assessment was recognised in transit in 5.8%. An initially shockable rhythm might have transitioned into a non-shockable rhythm over time and cases that were initially responsive to defibrillation may have been lost.[14] It has been observed that the Indian EMS exhibits fragmentation and limited accessibility, as ambulances primarily function as transport vehicles and cannot often provide essential emergency care, with considerable variation in ambulance models and inconsistent technical standards for EMTs.[9,15,16] Furthermore, non-ambulance modes of transport, including private vehicles or auto rickshaws, constituted nearly 60%. That is, a significant number of individuals either do not contact EMS or, if they do, they receive EMS of notably low quality.

Patients who received continuous bystander CPR and reached the hospital showed significantly higher survival rates to hospital admission compared to those who had interruptions in CPR. The only survivor in this study period had received continuous CPR throughout the prehospital phase, administered by his office colleagues. When comparing the outcomes of patients arrested in the ED to all OHCAs, the ones who were arrested in the ED had significantly better outcomes. However, for OHCA patients who received continuous CPR from the scene until arrival at the hospital, there was no significant statistical difference in survival rates compared to patients who experienced cardiac arrest in the ED, despite the difference in median low-flow times (45 minutes for OHCA patients vs 9 minutes for ED patients). Although the sample size was limited, these results underscore the critical role of continuous CPR in enhancing survival rates.

Of the patients referred from other facilities, merely 20% received continuous CPR before arriving at our hospital. Some facilities declined admission and opted for non-ambulance transport. This phenomenon indicates skill deficiencies and facility limitations including a robust patient transport network. There is scope for further research to understand general practitioners' CPR awareness, skills, and readiness for improvement.

The study revealed a 3.1% survival rate for young adults aged 18–49 coming to ED with OHCA. Out of the total young adults in our study, 40.6% had a confirmed cardiogenic cause, while another 40.6% were labelled as an "unknown cause". Considering India's high mortality rate and the early onset of cardiovascular disease,[17–19] there is a high probability a substantial proportion of these cases with "unknown causes" might also have had underlying cardiovascular diseases. A report indicated that 21% of sudden cardiac death cases were under 50 years of age and were due to unevaluated ischemic heart disease,[20] which correlates well with our study findings. We also observed that potentially 21.1% of the non-traumatic cardiac arrests we received were likely due to a cardiogenic aetiology.

In the chain of survival, identification of a cardiac arrest is the first step, followed by good quality bystander CPR, early defibrillation, quick transfer to the hospital and good quality post-resuscitation care. To improve any outcomes, we must first accept the evidence that the chain of survival is fractured nationwide. For better acceptance, more data is needed.

Firstly, OHCA registries are being encouraged globally[12,21] to serve as an accessible database for identifying problems in the chain of survival, assessing the effectiveness of education, implemented measures and continuous quality improvement, ultimately contributing to improved survival rates. We note that registries have been established in several regions of India[22,23] but they need to be consolidated, which will require significant administrative capacity. Until an official registry is established, each facility should be prepared to collect and later integrate data. Emergency departments should take the lead in maintaining the registry as OHCA cases typically pass through the ED in almost every facility.

Undeniably, bystander CPR education holds a pivotal role in improving OHCA outcomes in India and this study emphasises this. Recent reports from Sweden[11] highlight a threefold increase in 30-day survival rates with favourable neurological function in young adults over the past 30 years. This is attributed to, improvements in dispatcher-assisted CPR (DACPR), widespread CPR training and the wide distribution of public AEDs, along with bystander CPR rates exceeding 60%. Our study reveals low rates of bystander CPR, AED utilisation and EMS usage, as demonstrated in previous observations.[6] A 2018 survey in Bengaluru, India,[24] found that 92% of the public was unfamiliar with CPR, 6% knew about AED and only 3% had received training aligning with our study's results.

Other essential factors, as noted in various studies, include ambulance accessibility, quality emergency care and supportive healthcare policies.[7–9,13,22] However, there is an urgent need to improve survival rates, especially for younger patients. We, therefore, propose key areas where emergency physicians should play a central role in achieving this goal.

It was found EMS providers follow the usual protocols that patients be taken to the nearest medical facility when in a situation like cardiac arrest. While this is correct and appeals to common sense, provided the nearest facility is well equipped to handle cardiac arrest. We found that the first centre the patient went has immediately transferred the case to a higher centre, sometimes in the same vehicle the patient was brought in. Often this was the first time the patient was identified as a cardiac arrest. We identify this as a weak link in the chain and there is potential to intervene here. It is possible to train and equip any setup to ensure good quality CPR is administered and continued till the patient reaches a higher centre. Mechanical CPR devices could help EMS in the transportation of patients to higher centres.

Coming to the final link in the chain of survival is a cardiac arrest centre (CAC). Cardiac arrest centres aligning with existing research[25,26] highlight their significant role in improving outcomes. A CAC is a facility extensively equipped to manage not only emergency coronary angiography but also comprehensive post-resuscitation care, consolidating cases of cardiac arrest or near-cardiac arrest. Upon designation, the facility should be identifying itself as CAC, and EMS agencies must be informed that

unresponsive patients or those on the verge of respiratory failure should be transported to the nearest CAC, rather than the nearest healthcare facility lacking the capacity to conduct comprehensive resuscitation.

The CACs should possess a dedicated EMS system with transport capabilities for continuous CPR. In India, where ambulances typically have only one EMT, ensuring a minimum of two trained paramedics is crucial for transporting patients while maintaining continuous advanced cardiovascular life support. Moreover, integrating DACPR into CAC protocols is crucial for improving the quality of bystander CPR.[11] It is also recommended that all CACs establish and maintain a Utstein-style OHCA registry as described above.

Several centres have implemented or are in the process of implementing extracorporeal cardiopulmonary resuscitation (ECPR), but it is not yet widely available in India.

While the recommendation from the American Heart Association[27] and European Resuscitation Council guidelines[21] regarding ECPR may not be strong, a systematic review, incorporating findings from three recent randomised controlled trials, suggests the potential benefits of this intervention.[28–31] However, due to the resource-intensive and costly nature of ECPR, defining patient selection criteria for ECPR remains imperative.[31]

Guidelines from the Extracorporeal Life Support Organization[32] (ELSO) offer valuable insights, but their applicability may not entirely align with the unique circumstances in India. With a healthy life expectancy at birth of 60.3 years,[33] the application of ECPR could be reasonably considered for young adults under the age of 50 years, which was the focus of our study.

Furthermore, the decision to initiate ECPR should be based on the initial shockable rhythm,[34] provided continuous prehospital CPR has been administered. However, in the Indian context, a witnessed cardiac arrest may be a poor candidate for ECPR due to factors such as bystander failure to recognise cardiac arrest and low rates of bystander CPR. Additionally, our study revealed a median travel time of 40 minutes in congested Indian cities, underscoring the importance of initiating ECPR as soon as possible upon arrival at the hospital. This highlights the need to develop systems that facilitate the introduction of prehospital ECPR, which may improve prognosis in the future.[35]

In our dataset, only three patients fulfilled the given criteria and were identified as potential candidates for ECPR. All of them arrested due to cardiogenic causes. Only one survived to discharge with a favourable neurological outcome, but the potential benefits of ECPR could be further explored. In India, ECPR is predominantly utilised for in-hospital cardiac arrest situations.[36,37] However, broadening its application to encompass OHCA scenarios is crucial.

Limitations

As a single facility registry, our findings may not fully capture the overall situation in India. Registry research limitations include missing information and potential recall bias in confirmed points with attending physicians. Furthermore, one case was lost to follow-up after discharge.

Conclusion

This study contributes a new report to the limited available data on OHCA in India, where the high mortality rate has become evident. The research underscores the critical importance of bystander CPR and the use of AED. Our primary recommendation is that the initial steps in changing the scenario should begin with education. While citizen education is crucial, its impact may require a substantial amount of time to be realised. Therefore, in the interim, we highlight areas that require improvement, including the establishment of a Utstein-style OHCA registry, the designation of CACs with dedicated emergency systems, DACPR, mechanical CPR devices and the contemplation of introducing ECPR. As emergency physicians are the first line of action in OHCA, they can play a central role in addressing these concerns.

Clinical Significance

Our study reveals critical deficiencies in OHCA management in South India, underscoring the need for urgent, targeted interventions. The notably low survival rates emphasise the urgency of strategic measures. Recommendations include establishing an OHCA registry for comprehensive data collection, widespread public education on bystander cardiopulmonary resuscitation, creation of specialised Cardiac Arrest Centres and the integration of extracorporeal cardiopulmonary resuscitation are also proposed. These initiatives, with an emphasis on the pivotal role of emergency physicians, hold significant potential to enhance survival outcomes and advance the overall quality of OHCA care in the region.

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