Deployment and Utilization of Public Access Defibrillation in Taiwan

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Background

Public assess defibrillation is crucial to survival of out-of-hospital cardiac arrests (OHCA). Since 2013, eight categories of public locations are required by law to install public AEDs. A compulsory National AED Registry was implemented that registered all public AEDs, and collected incident reports and electrocardiograms from OHCA with public AED use.

Objective

This study aims to review public AED installation in Taiwan since 2013, and to describe incidence and characteristics of OHCAs with public AED use.

Method

Data were collected from Taiwan Public AED Registry. Public AED installation across the country was reviewed.

Detailed characteristics of public AED uses, including incidence, locations, rescuers type, initial rhythms and B-CPR(bystander-CPR), were analyzed via examining incidents reports and ECGs.

Result

From July. 2013 to Dec. 2017, 8425 public AEDs were registered and disclosed. Two leading locations of public AED installation were schools/large gathering venues (42.17%) and others (33.21%), while other locations showed less increase. Until Aug. 2016, 344 public AED use were reported, and 247 cases had ECGs for analysis. The top three locations with public AED use were others (34.9%), schools/large gathering venues (21.8%) and traffic hubs (12.5%). Locations with highest utilization rates were long-distance vehicles(22.4%), while schools/large gathering venues were the lowest (2.3%). The overall shockable rhythms were 34.0%; highest among schools/large gathering venues (53.5%) and lowest among long-distance vehicles (17.2%).

Figure 1. Distribution of Public Areas for Cases of AED used

Table 1. The Incident of AED Used for Eight Types of Public Areas

	AED Used	AED Disclosed	Used/Disclosed (%)
Traffic Hubs	43	488	8.8
Long-Distance	33	147	22.4
Transportation Vehicles			
Tourist Attractions	21	461	4.6
Schools, Large Gathering Venues or Speccical organization	75	3291	2.3
Large Leisure Activity Venues	12	291	4.1
Large Shopping Area	16	242	6.6
Hotels	18	220	8.2
Public Baths or Hot Spring Resort	6	50	12.0
Others	120	2450	4.9
Total	344	7640	4.5

Table 2. The Rate of Shockable Rhythm among AED used for Eight Types of Public Areas

	Shockable ryhtym	AED Used	Shockable rhythm/AED used (%)
Traffic Hubs	8	21	38.1
Long-Distance	5	29	17.24
Transportation Vehicles			
Tourist Attractions	3	16	18.75
Schools, Large Gathering Venues or Speccical organization	31	58	53.45
Large Leisure Activity Venues	3	6	50
Large Shopping Area	6	13	46.15
Hotels	5	12	41.67
Public Baths or Hot Spring Resort	2	5	40
Others	21	87	24.14
Total	84	247	34.01

* AED used with ECG recorded

The overall ROSC rates (n=265) were 40.8%, highest among traffic hubs(53.3%) and lowest among large shopping areas(25.0%). The majority of rescuers were facility employees(n=101, 43.91%) and medical staff (n= 96, 41.74%). Only few victim's families (2.17%) and unrelated laypersons (6.52%) acted as first responders. Rates of B-CPR were 69.3%, and were associated with more shockable rhythm (38.4% vs. 32.9%).

Conclusion

Public AED installed and use have rapidly increased in Taiwan since 2013. Disparities between AED installation and use among locations were observed. OHCAs with PAD use had significantly higher rates of shockable rhythms, bystander CPR, and ROSCs. Further PAD optimization should balance between installation, utilization, shockable rhythms and potential outcomes. Apart from device installations, the importance of community involvement cannot be overemphasized.