Gender difference of Caller in Successful Dispatcher assisted Cardiopulmonary resuscitation in Out-of-hospital Cardiac arrest.

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Objectives

The effects of bystander characteristic on successful bystander CPR is not known. The aim of this study is to evaluate the bystander characteristics and the effect of gender of bystander on successful bystander CPR.

Methods

Subject

Nationwide OHCA registry in Korea(2014~2017)

Adult OHCA patients with presumed cardiac etiology

Cases that the callers got CPR instruction via telephone by dispatchers

Exclusion criteria

Less than 18 years old

OHCA detected by EMS personnel

Without information of the caller

Exposure

The Gender of the caller(Male/Female)

Main outcomes

Successful bystander CPR assessed by the dispatcher

Hospital mortality and Neurological recovery

Statistical analysis

- Descriptive statistic for patients and caller characteristics
- Multivariable logistic regression analysis : Calculate adjusted odds ratios (AORs) with 95% confidence intervals (95% CIs) for male caller compared to female caller / Adjusting for patients' age, gender, past medical history, Location of arrest, witnessed arrest, ECG, Case year, metropolitan city, CPR education status
- Interaction model (Patient gender*caller gender) added to compare the effect size of the hypoxia across shock
- Sensitivity analysis (Location of arrest)

Table 1. Demographic characteristics of study population by gender of caller

		All		Female caller		Male caller		P-value
		N	%	N	%	N	%	
All	N	33969	100.0	14582	100.0	19387	100.0	
Patient Characteristics / Demographic characteristics								
Patient gender	Female	13009	38.3	5566	38.2	7443	38.4	0.6778
Patient age, ≥65 years old		22104	65.1	9829	67.4	12275	63.3	<.0001
Age, median (IQR)		73 (58.96-81.38)		73.91 (59.95-82.15)		72.24 (58.34-80.8)		
Past medical history								
	DM	7221	21.3	3233	22.2	3988	20.6	0.0004
	HTN	11098	32.7	5060	34.7	6038	31.1	<.0001
	Heart disease	5368	15.8	2352	16.1	3016	15.6	0.1521
	Stroke	3027	8.9	1450	9.9	1577	8.1	<.0001
Metropolitan city		15330	45.1	6827	46.8	8503	43.9	<.0001
Location of arrest, public place		4401	13.0	780	5.3	3621	18.7	<.0001
ECG								<.0001
	VF/VT	3144	9.3	1204	8.3	1940	10.0	
	PEA	2711	8.0	1217	8.3	1494	7.7	
	Asystole	28114	82.8	12161	83.4	15953	82.3	
Caller(Bystander) characteristics								
	Witnessed	15084	44.4	6644	45.6	8440	43.5	0.0002
	Prior CPR education	10678	31.4	4122	28.3	6556	33.8	<.0001
	Bystander defibrillation	154	0.5	65	0.4	89	0.5	0.8565
EMS time interval, median (IQR) [min]								
	Response time	7 (5-9)		7 (5-9)		7 (5-10)		<.0001
	Scene time	12 (9-16)		12 (9-16)		11 (8-15)		0.4112
	Transport time	6 (4-10)		6 (4-10)		6 (4-10)		0.3075
ED level								0.0061
	Lv1	5142	15.1	2246	15.4	2896	14.9	
	Lv2	16354	48.1	7122	48.8	9232	47.6	
	Lv3~	12473	36.7	5214	35.8	7259	37.4	
Outcomes								
	Successful bystander CPR (Assessed by medical dispatcher)	25106	73.9	10585	72.6	14521	74.9	<.0001
	Prehospital ROSC	3076	9.1	1232	8.4	1844	9.5	0.0007
	Survival to discharge	2244	6.6	897	6.2	1347	6.9	0.0034
	Good neurological outcome	1502	4.4	559	3.8	943	4.9	<.0001

Figure 1. Patient flow

Table 2. Time to CPR by gender of caller

	All		Female caller		Male caller		P-value
	N	%	N	%	N	%	
Call to medical dispatcher time, median (IQR) [sec] (N=33969)	50	(36-73)	49	(35-72)	51	(36-73)	
Call to CPR time, median (IQR) [sec] (N=30178)	171	(125-234)	176	(126-239)	168	(124-231)	
Medical Dispatcher to CPR time, median (IQR) [sec] (N=32580)	111	(73-164)	115	(75-169)	109	(72-160)	
Call to CPR time<180s	16239	53.8	6714	51.8	9525	55.3	<.0001
Medical dispatcher Time to bystander CPR<60s	5388	16.5	2231	16.0	3157	16.9	0.0247

Table 3. Multivariable logistic regression for male caller compared to female caller

		Outcomes	Model 1			Model2*			Model 3**		
		n/N (%)	AOR	95% CIs		AOR	95% CIs		AOR	95% CIs	
Successful bystander CPR											
	Female callder	10585/14582(72.6)	1.00			1.00			1.00		
	Male caller	14521/19387(74.9)	1.12	1.06	1.17	1.12	1.07	1.18	1.17	1.12	1.24
Survival to discharge											
	Female caller	897/14582(6.2)	1.00			1.00			1.00		
	Male caller	1347/19387(6.9)	1.10	1.01	1.20	1.12	1.02	1.22	0.85	0.76	0.96
Good neurologic recovery											
	Female caller	559/14582(3.8)	1.00			1.00			1.00		
	Male caller	943/19387(4.9)	1.25	1.12	1.39	1.26	1.13	1.41	0.93	0.80	1.08

Model 1. adjusted for patient's age and gender

*Model 2 adjusted for patient's age and gender, comorbidities(Hypertension, Heart diseases, Stroke)

**Model 3.adjusted for patient's age and gender, comorbidities(Hypertension, Heart diseases, Stroke) + Arrest & caller characteristics

Table 4. Interaction analysis (Patient gender x caller gender)

	Successful bystander CPR	Survival to discharge	Good neurological recovery
	Adjusted OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR (95% CI)
Female Patient			
Female caller	1.00	1.00	1.00
Male caller	0.97 (0.89-1.05)	0.82 (0.66-1.03)	1.05 (0.76-1.45)
Male Patient			
Female caller	1.00	1.00	1.00
Male caller	1.33 (1.25-1.42)	0.87 (0.75-0.99)	0.90 (0.76-1.06)

Table 5. Sensitivity analysis : Location of arrest

	Outcomes		Model3	
	n/N (%)	AOR	95% CI	
Public				
Successful bystander CPR				
Female caller	552/780(70.8)	1.00		
Male caller	2659/3621(73.4)	1.14	0.95	1.36
Survival to discharge				
Female caller	114/780(14.6)	1.00		
Male caller	663/3621(18.3)	1.12	0.83	1.50
Good neurologic recovery				
Female caller	86/780(11.0)	1.00		
Male caller	505/3621(13.9)	0.98	0.70	1.36
Private				
Successful bystander CPR				
Female caller	10033/13802(72.7)	1.00		
Male caller	11862/15766(75.2)	1.18	1.12	1.24
Survival to discharge				
Female caller	783/13802(5.7)	1.00		
Male caller	684/15766(4.3)	0.81	0.71	0.92
Good neurologic recovery				
Female caller	473/13802(3.4)	1.00		
Male caller	438/15766(2.8)	0.92	0.78	1.10

Conclusion

Male bystanders showed a higher success rate on bystander CPR than female bystander but showed no higher survival or neurologic recovery. Different education and instruction protocols by dispatcher according to the bystander gender would be needed to improve bystander CPR rate.