



COMPARISON OF LONG-TERM OUTCOMES IN PATIENTS AFTER ACUTE MYOCARDIAL INFARCTION WITHAND WITHOUT OUT-OF-HOSPITAL CARDIAC ARREST – A NATIONWIDE-BASE STUDY

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INTRODUCTION

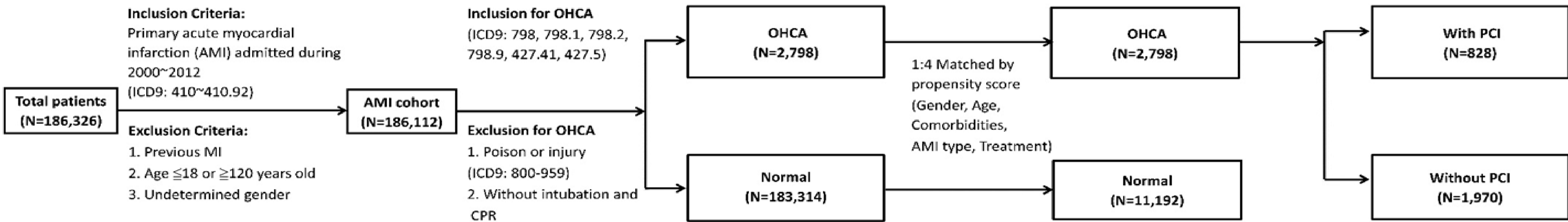
Out of hospital cardiac arrest (OHCA) is one of catastrophic results of acute myocardial infarction (AMI). This study was aimed to evaluate the long-term outcome of patients, who suffered AMI complicated or uncomplicated OHCA.

METHOD

This is a nationwide, propensity score-matched, case-control study included 186,112 patients who were admitted due to AMI. Propensity score matching in a ratio of 1:4 by age, sex and comorbidities was adopted. Finally, 2,798 AMI with OHCA patients and 11,192 AMI without OHCA patients were respectively enrolled in our analysis.

RESULTS

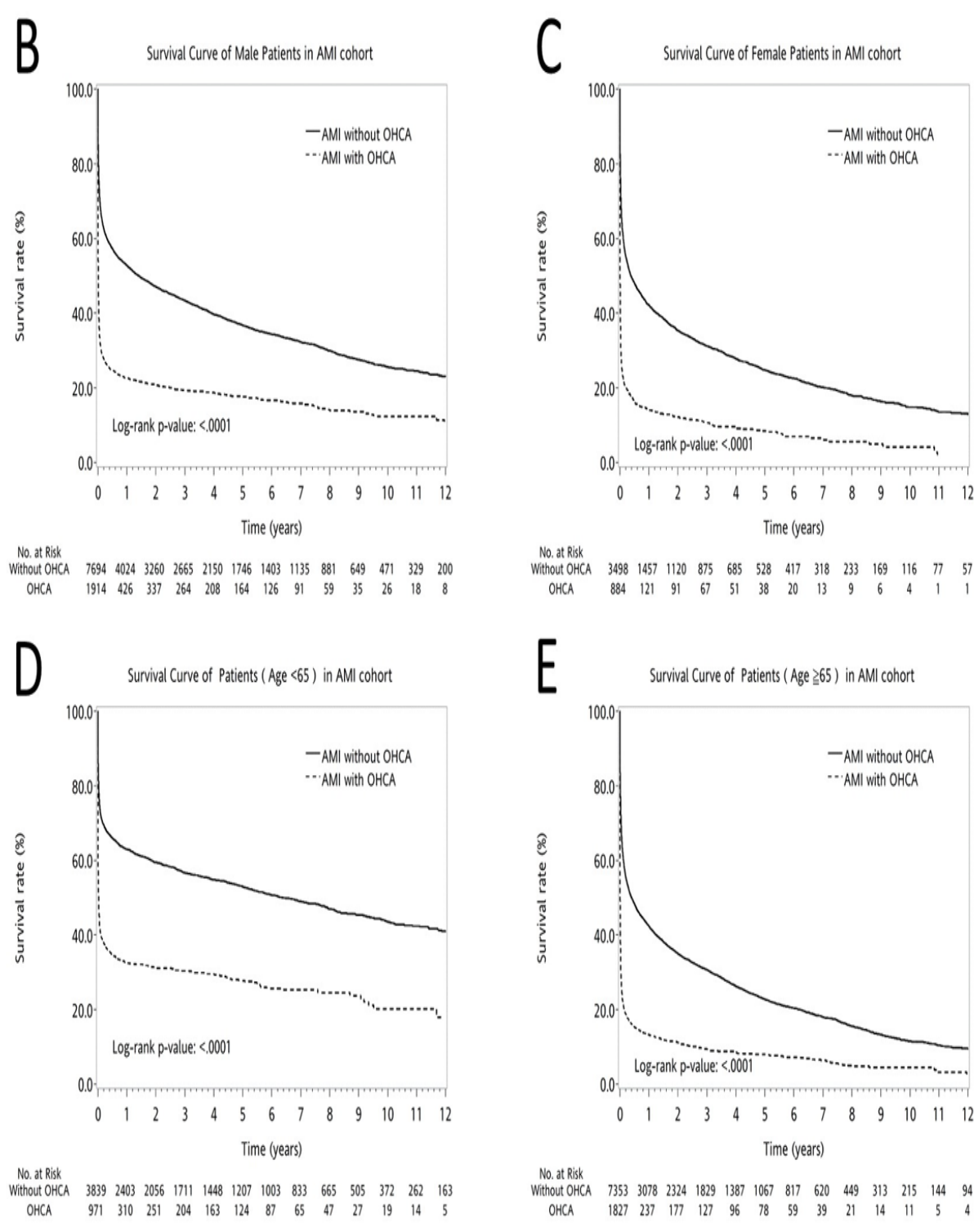
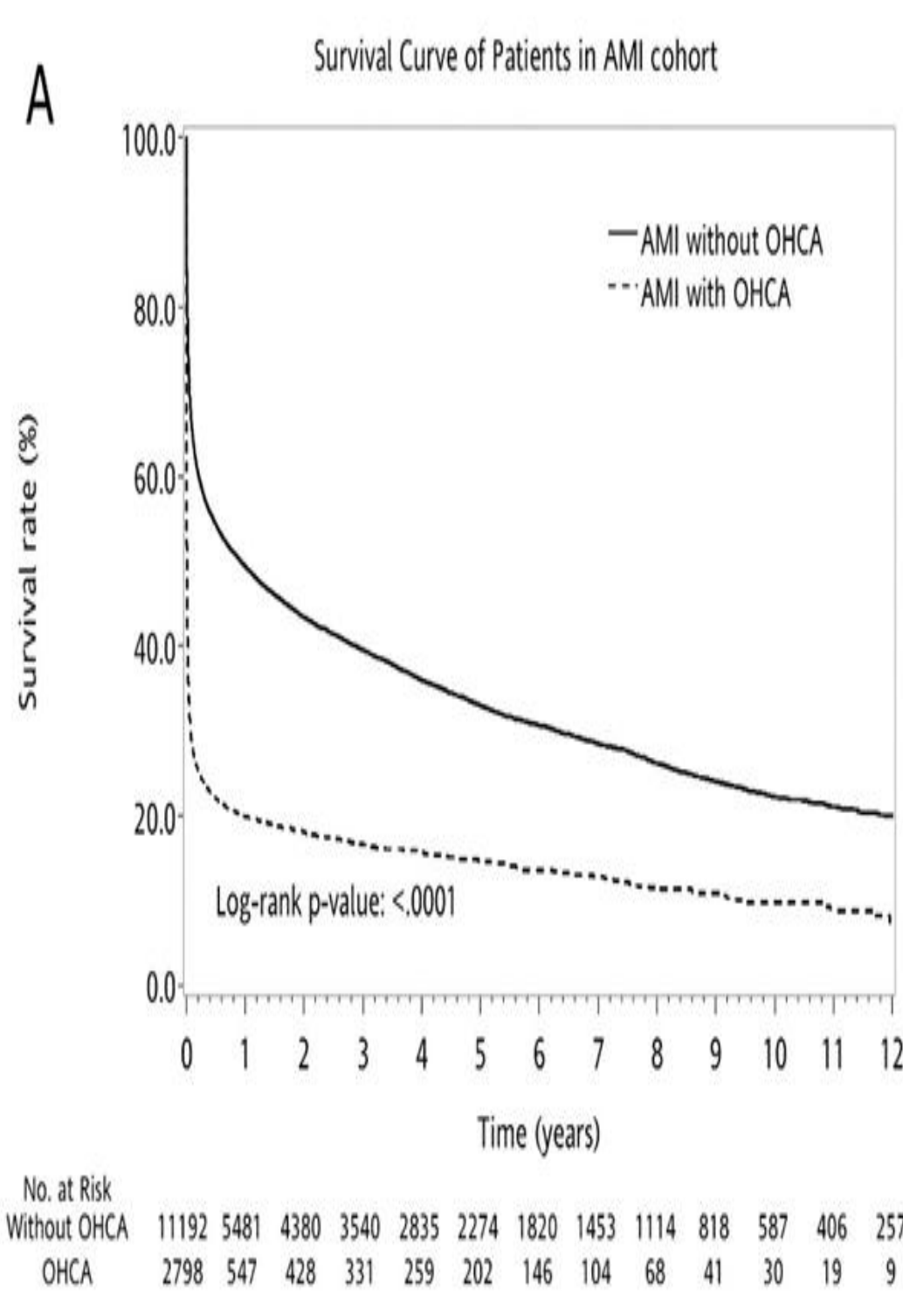
Compared with patients who got AMI not complicated by OHCA, the patients with AMI complicated OHCA had higher mortality rate, even regarding age, gender, and presence of comorbidity, like hypertension and type 2 diabetes. AMI complicated OHCA patients had higher ratio of ventricular fibrillation (39.85% vs 0.31%, P<0.0001), lower percentage of medication therapy, lower percentage of revascularization (percutaneous coronary intervention: 29.59% vs 37.92%, P<0.0001, coronary artery bypass graft: 4.72% vs 9.68%, P<0.0001) and higher percentage of using intra-aortic balloon pump (15.62% vs 9.69%, P<0.0001). Cox regression model showed that OHCA, renal failure, and diabetes conferred 2.29-fold, 1.33-fold and 1.23-fold excess risk of long-term mortality rate. Within AMI complicated OHCA patients, the Cox regression model showed PCI, CABG, usage of any anti-platelet agent, angiotensin converting enzyme inhibitor (ACEI) / angiotensin receptor blocker (ARB), statin and beta blocker conferred 0.58-fold, 0.54-fold, 0.65-fold,0.65-fold, 0.62-fold and 0.64-fold decreased risk of long-term mortality.



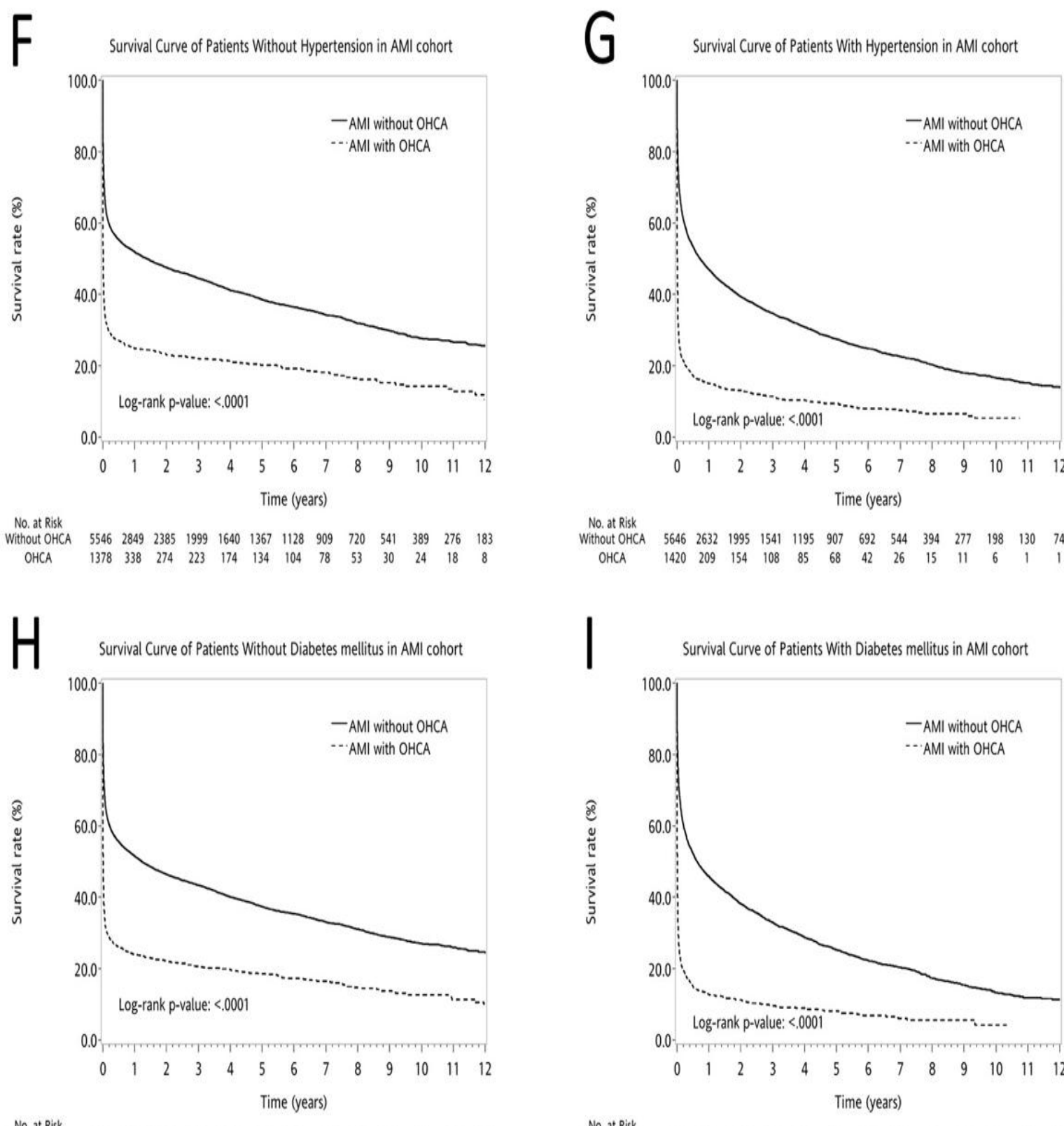
Figures1

	Normal (n=11192)	OHCA (n=2798)	P-value
Operation			
PCI	4174 (37.29)	828 (29.59)	<0.0001
CABG	1083 (9.68)	132 (4.72)	<0.0001
IABP	1080 (9.65)	437 (15.62)	<0.0001
Medications			
Any anti-platelet agent	8782 (78.47)	1799 (64.30)	<0.0001
ACEI	4989 (44.58)	831 (29.70)	<0.0001
ARB	1786 (15.96)	268 (9.58)	<0.0001
ACEI or ARB	5869 (52.44)	944 (33.74)	<0.0001
Statin	2343 (20.93)	529 (18.91)	0.0175
Beta blocker	4744 (42.39)	858 (30.66)	<0.0001

	Normal (n=11192)	OHCA (n=2798)	P-value
Sex			
Male	7694 (68.75)	1914 (68.41)	0.7291
Age, mean(SD)	69.76 (13.74)	69.1 (13.48)	0.0216
age≥65	7353 (65.70)	1827 (65.30)	0.6888
Comorbidities			
Hypertension	5646 (50.45)	1420 (50.75)	0.7738
Dyslipidemia	3186 (28.47)	812 (29.02)	0.5618
Diabetes mellitus	4101 (36.64)	1034 (36.95)	0.7589
Peripheral vascular disease	425 (3.80)	117 (4.18)	0.3462
Heart failure(Major)	897 (8.01)	230 (8.22)	0.7209
End stage renal disease	677 (6.05)	165 (5.90)	0.7625
CVA(Stroke New Definition)	579 (5.17)	140 (5.00)	0.716
COPD	1482 (13.24)	371 (13.26)	0.9801
Liver failure	286 (2.56)	79 (2.82)	0.4263
renal failure	2210 (19.75)	542 (19.37)	0.6551
Respiratory Failure	8278 (73.96)	2071 (74.02)	0.9539
Metabolic problem	238 (2.13)	72 (2.57)	0.151
cardiomyopathy	209 (1.87)	49 (1.75)	0.6829
atrial flutter fibrillation	1008 (9.01)	264 (9.44)	0.4803
pulmonary embolism	75 (0.67)	26 (0.93)	0.1476
Asthma	641 (5.73)	172 (6.15)	0.3958
malignancy	1258 (11.24)	326 (11.65)	0.5594
Ventricular fibrillation	35 (0.31)	1115 (39.85)	<0.0001
Cardiac Arrest	21 (0.19)	1410 (50.39)	<0.0001
AMI Type(STEMI)	3684 (32.92)	876 (31.31)	0.1045



Figures 2



Figures 6

Figures 3

Variables	Adjusted HR (95% CI)	p-value
Sex	0.98 (0.94 ,1.03)	0.4479
age≥65	1.66 (1.58 ,1.74)	<0.0001
Comorbidities		
Out-of-hospital cardiac arrest	2.29 (2.18 ,2.40)	<0.0001
Hypertension	1.03 (0.99 ,1.08)	0.1437
Dyslipidemia	0.95 (0.88 ,1.02)	0.1557
Diabetes mellitus	1.23 (1.18 ,1.29)	<0.0001
Peripheral vascular disease	1.17 (1.06 ,1.29)	0.0014
Heart failure (Major)	1.03 (0.96 ,1.11)	0.3558
End stage renal disease	1.04 (0.95 ,1.14)	0.4253
CVA(Stroke New)	1.04 (0.96 ,1.14)	0.3211
Liver failure	1.04 (0.93 ,1.17)	0.4791
renal failure	1.33 (1.26 ,1.41)	<0.0001
cardiomyopathy	0.90 (0.78 ,1.03)	0.1285
atrial flutter fibrillation	0.99 (0.92 ,1.06)	0.6922
pulmonary embolism	0.93 (0.76 ,1.16)	0.5304
AMI Type(STEMI)	0.97 (0.92 ,1.01)	0.1624
Operation		
PCI	0.49 (0.46 ,0.51)	<0.0001
CABG	0.52 (0.48 ,0.57)	<0.0001
Medications		
4 Any Antiplatelete	0.66 (0.63 ,0.69)	<0.0001
7 ACEI or ARB	0.72 (0.69 ,0.75)	<0.0001
8 Statin	0.84 (0.77 ,0.91)	<0.0001
9 Beta blocker	0.74 (0.71 ,0.78)	<0.0001

Figures 7

Figures 4

Variables	Adjusted HR (95% CI)	p-value
Sex	0.98 (0.90 ,1.07)	0.6899
age≥65	1.35 (1.22 ,1.48)	<0.0001
Comorbidities		
Hypertension	1.12 (1.02 ,1.23)	0.0148
Dyslipidemia	1.13 (0.98 ,1.29)	0.084
Diabetes mellitus	1.15 (1.05 ,1.26)	0.0023
Peripheral vascular disease	1.15 (0.94 ,1.39)	0.1769
Heart failure (Major)	0.96 (0.83 ,1.12)	0.6163
End stage renal disease	1.00 (0.82 ,1.21)	0.9647
CVA(Stroke New)	0.91 (0.76 ,1.08)	0.2776
Liver failure	0.79 (0.61 ,1.02)	0.0657
renal failure	0.93 (0.83 ,1.05)	0.2335
cardiomyopathy	0.87 (0.65 ,1.17)	0.3626
atrial flutter fibrillation	0.91 (0.80 ,1.05)	0.2105
pulmonary embolism	0.79 (0.53 ,1.18)	0.2508
AMI Type(STEMI)	1.04 (0.95 ,1.15)	0.4042
Operation		
PCI	0.58 (0.51 ,0.65)	<0.0001
CABG	0.54 (0.43 ,0.68)	<0.0001
Medications		
4 Any Antiplatelete	0.65 (0.59 ,0.72)	<0.0001
7 ACEI or ARB	0.65 (0.59 ,0.73)	<0.0001
8 Statin	0.62 (0.52 ,0.74)	<0.0001
9 Beta blocker	0.64 (0.57 ,0.71)	<0.0001

Figures 8

CONCLUSIONS

The study showed that implementation of continuous quality improvement using novel critical care system could increase sleep assessment ratio and good quality sleep ratio, and reduce average ICU stay. Furthermore, the incidence of ventilator-associated pneumonia and mortality also improved.