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Comparison of effectiveness of Digoxin in rate control atrial fibrillation patients in emergency department: pilot study.

Background:

Atrial fibrillation (AF) is the most common cause of cardiac dysrhythmia in emergency department. It is an important problem which increase the risk of thromboembolism, particularly an ischemic stroke. The patient with AF with rapid ventricular rate (RVR) can be treated by pharmacotherapy, and Digoxin is the most common medication used for controlling the ventricular rate. The study aims to compare the efficacy of Digoxin in rate control atrial fibrillation patients at Ramathibodi Emergency Department.

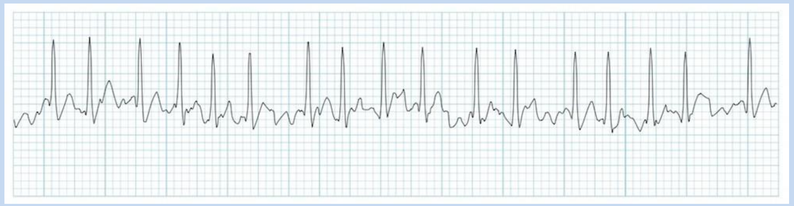

Figure 1: Electrocardiography (ECG) shows atrial fibrillation (AF)

Patients & Method:

The study was retrospective descriptive study that collected the information of AF with RVR patients (Heart rate >120 bpm) who presented at Ramathibodi ED since January to December 2016.

Data collection:

The outcome parameters are difference heart rate at the time before and after digoxin administration (ΔHR), prognostic factors related to the odd ratio of successful in rate control, compared between new onset and chronic AF population.

Result & Discussion:

There were 62 AF with RVR patients, 36 were new onset AF and 26 were chronic AF. There are no statistical significant in baseline characteristics among two groups. ΔHR in new onset AF was 46.2 ± 18.5 and 31.5 ± 36.1 in chronic AF, p-value = 0.103.

	Atrial fibrillation		P-value
	New AF (36)	Chronic AF (26)	
Different heart rate at the time before and after drug administration (ΔHR)	46.4 ± (18.5)	31.5 ± (36.1)	0.103

Table 1: Difference heart rate at the time before and after digoxin administration (ΔHR)

Univariable and multivariable analysis of prognostic factors include age, gender, comorbidity (hypertension, dyslipidemia, diabetes mellitus, congestive heart failure, cerebrovascular disease, cardiovascular / valvular disease, chronic kidney / renal failure) and vital signs before drug administration.

Data showed these prognostic factors do not increase odd of successful in rate control. However, atrial fibrillation patients with congestive heart failure, digoxin administration may increase odd of successful in rate control (OR 3.08, 95% CI 0.20-47.50, p-value = 0.420). The significant data need more study size.

Factors	Success (N = 39)	Failure (N = 23)	Odd ratio	95% CI	P-value
New AF (n,%)	23 (69.0)	16 (61.5)	0.44	0.09 - 2.20	0.319
Age (years)	65.9 ± 15.3	68.9 ± 13.9	1.03	0.98 - 1.07	0.244
Male (n,%)	23 (59.0)	14 (60.9)	1.01	0.20 - 5.21	0.991
Comorbidity					
Hypertension	22 (56.4)	10 (43.5)	2.58	0.43 - 15.71	0.302
Diabetes	14 (35.9)	6 (26.1)	0.79	0.15 - 4.28	0.787
Dyslipidemia	9 (23.1)	5 (21.7)	0.71	0.11 - 4.41	0.713
Heart failure	5 (12.8)	1 (4.4)	3.08	0.20 - 47.50	0.420
Cerebrovascular	9 (23.1)	5 (21.7)	2.53	0.29 - 21.82	0.400
Cardiovascular / valvular	10 (25.6)	6 (26.1)	2.36	0.32 - 17.52	0.402
Chronic kidney / Renal failure	4 (10.3)	3 (13.4)	0.75	0.07 - 7.62	0.809
Vital signs BEFORE drug administration					
Heart rate	145.9 ± 14.5	153.6 ± 14.2	0.97	0.92 - 1.02	0.247
Systolic BP	134.9 ± 25.8	134.5 ± 33.2	1.00	0.96 - 1.03	0.856
Diastolic BP	80.9 ± 18.9	80.8 ± 14.7	1.03	0.96 - 1.11	0.412
Body temp.	37.1 + 1.0	37.2 + 0.9	1.08	0.49 - 2.37	0.850

Table 2: Prognostic factors related to the odd ratio of successful in rate control (Multivariable analysis)

Conclusion & Perspective:

There are no statistical significant in effectiveness of digoxin administration between new onset and chronic AF patients (but there are clinical significant in new onset AF). In patients who comorbid with CHF, digoxin may increase the odd of successful in rate control.