Upsala J Med Sci 106: 77–80, 2001

# The Effect of Digitalis or a Beta-Blocker, Alone or in Combination, on Atrial Fibrillation at Rest and During Exercise

*Short communication*

Konstantin Holming

*Department of Medicine, Mälarsjukhuset, S-631 88 Eskilstuna, Sweden*

Atrial fibrillation (AF) is a common disease with a prevalence of about one percent in Sweden. Direct current conversion is considered as the method of choice to restore sinus rhythm (2). However, different drug regimens such as digitalis, beta-blockers and calcium-channel blockers have also been used to convert AF. The capacity of these drugs to restore sinus rhythm is however relatively poor and the main indication is to reduce the heart rate and relieve the patient's symptoms. Digitalis reduces the heart rate at rest in most patients with AF, but during exercise this effect is attenuated (1,4). Beta-blockers have been regarded as superior to digitalis in that respect (3,5). Against this background, a small pilot study has been carried out in order to compare the effects of digitalis and a beta-blocker or the combination of both drugs on the heart rate at rest and during exercise in patients with chronic AF.

Thirty-one patients (mean age 68 years, 21 men and 10 women) with chronic AF , who were not treated with any chronotropic drug, were randomised to treatment with a beta-blocker (Sotalol, 80 mg x 2) (Group 1), digitalis (digoxin 0.13-0.25 mg x 1) (Group 2), or a combination of both drugs (Group 3). The duration of the AF was 2-12 months (mean 5 months). Before the treatment was started the patients performed an ECG bicycle exercise test as well as after one month´s therapy.

The three groups were well comparable in regard to age, sex distribution and duration of AF. Table1 shows the heart rate at rest, during maximal exercise and at 10 min after exercise as well as the total work load capacity. The heart rate at rest and at 10 min after exercise did not differ between the three groups. In contrast, the heart rate during maximal exercise was significantly lower in the patients treated with beta-blockade or a combination of beta-blockade and digitalis compared to those treated with digitalis alone. The maximal work load capacity did not differ between the three groups.In this context it should be pointed out that all patients on digitalis therapy had a serum concentration of digoxin within the therapeutic range.

In conclusion, beta-blockers give a significantly better control than digitalis of the heart rate during maximal exercise in patients with chronic AF. In addition, there is nothing gained by the combination of both drugs. Further, the work load capacity is not influenced by the type of drug regimen.

**Table 1.** Heart rate at rest, during maximal exercise, at 10 min after exercise and total work load capacity of the 31 patients subdivided in 3 groups. Mean values ± standard deviation.

| | Group 1 | Group 2 | Group 3 |
|---|---|---|---|
| | Sotalol (n=11) | digitalis (n=10) | Sotalol and digitalis (n=10) |
| Heart rate at rest (beats/min) | 79±15 | 82±15 | 78±17 |
| Heart rate during maximal exercise (beats/min) | 136±16* | 195±14 | 144±26* |
| | p< 0,01 | p< 0,01 | |
| | | n.s. | |
| Heart rate at10 min after exercise (beats/min) | 84±11 | 86±8 | 86±14 |
| Total work load capacity (W) | 123±27 | 115±23 | 104±30 |

* denotes significant differences $p < 0.01$ between groups 1 and 3 compared to group 2. n.s.= not significant.

## REFERENCES


1. Falk, R.& Leavitt, J.: Digoxin for atrial fibrillation: a drug whose time has gone? Ann Intern Med 114:573-575,1991.

2. Holming, K.& Nilsson, G.: Förmaksflimmer i allmänläkarvården (Abstract, Swe.). Svenska Läkaresällskapets handlingar Hygiea 103:137, 1994.

3.Jordaens,L.,Trouerbach,J.,Calle,P.,Tavernier,R.,Derycke,E.,Vertongen,P.,Bergez,B.& Vandekerckhove, Y.: Conversion of atrial fibrillation to sinus rhythm and rate control by digoxin in comparison to placebo. Eur Heart J 18:643-648, 1997.

4. Rawles, J., Metcalfe, M.& Jennings, K.: Time of occurrence, duration and ventricular rate of paroxysmal atrial fibrillation: the effect of digoxin. Br Heart J 63: 225-227, 1990.

5. Rawles, J.,Trouerbach, J. & Calle, P.: What is meant by a "controller" of ventricular rate in atrial fibrillation? Br Heart J 63:157-161, 1990.



Address for reprints: Konstantin Holming, M.D.

Department of Medicine, Mälarsjukhuset, S-63188 Eskilstuna, Sweden