

High prevalence of AF found among cross-country skiers

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Next month, in the Norwegian town of Rena, 12,000 elite cross-country skiers will line up for this year's Birkebeiner ski marathon, an annual endurance race which will take them through 54 kilometres of snow-covered countryside to the winter sports resort of Lillehammer.

The race has been run almost every year since 1932, and in 1976 almost 150 participants were invited to take part in a long-term study designed to discover the extent of latent heart disease in these elite cross-country skiers. Now, after some 30 years, the results of the follow-up study have been published and suggest that long-distance competition skiers - as well as other endurance athletes - are at an unusually high risk of [atrial fibrillation](#), the most common abnormality of the heart's beating rhythm.

Results showed that participants in the study are at a high risk of atrial fibrillation (AF) without known structural heart disease or other known causes (a condition termed "lone" AF). A prevalence of 12.8% found among the skiers who completed the study's investigations in 1976, 1981 and 2004-2006, when echocardiographic (ECG) and heart rate tests were performed at rest and at exercise. In the general population studies have found the prevalence of AF to be as low as 0.5%, with rates only rising to around 15% in men over the age of 75.

When the study began in 1976 participants were classified according to age - group I 26-33 years, group II 43-50 years, and group III 58-64 years; all had been competing in long-distance skiing events and were in the top 25% for age related performance. When the final follow-up

examinations were performed during 2004-2006, a large proportion from group III (28/39) had died, leaving 78 of the original 122 available for further tests and questioning.

This analysis showed that 13 of those 78 skiers (16.7%) had experienced AF at some time during the 28-30 years of follow-up, with a current prevalence of 12.8% AF with no other known [heart disease](#). The latter, say the investigators, "is the highest prevalence yet described in long-term endurance sport practitioners". In age group I the prevalence was found to be 18.2%. The mean age at which the AF occurred was 58 years.

The study also detected two characteristics in the skiers which may predict their risk of AF: a slow heart rate at rest (known as bradycardia) and a large left atrium of the heart. Both have been suggested in previous studies as common findings in the hearts of endurance athletes. However, the study found no association between the years of training in cross-country skiing (an average of 36 years in this study) and the occurrence of AF. As a result, the authors advise that there is "still not enough evidence to recommend a specific age to reduce training volume and/or intensity". However, they do recommend that after the appearance of AF practice should be stopped or reduced "until rhythm control is attained".

Disturbances in heart rhythm, which are the most common cause of sudden cardiac death, represent one of the major cardiovascular reasons for hospital admission. Professor Josep Brugada, President of the European Heart Rhythm Association of the ESC (and Medical Director at the Hospital Clinic in Barcelona), has described their impact as "enormous", noting that around 5% of all medical expenditure in Europe is related to atrial fibrillation, the most common arrhythmic condition.

So far, only three case-control studies have found a higher prevalence of

AF in athletes than in controls. However, a population-based study from 2009 showed that those with the highest level of endurance training also had the highest prevalence of AF.

Studies aiming to find an explanation for a higher AF prevalence have also found that the size of the heart muscle and chambers was larger in athletes than in controls, and this seemed a predictor for AF.

Commenting on the findings from the Birkebeiner study, principal investigator Dr Jostein Grimsmo from the Feiring Heart Clinic in Norway, agreed that enlargement of the heart's left atrium - along with bradycardia - appeared to be "an important risk factor for AF among long-term endurance cross-country skiers". This atrial enlargement, he said, is the heart's adaptation to endurance training.

"As many as 20% of young competitive athletes have been found to have an enlarged [left atrium](#) in some studies," said Dr Grimsmo. "But we are not aware of any documentation of such a high prevalence as we have found either in athletes or in controls under the age of 75!"

"But despite our findings," he added, "we still can't say why some athletes end up with AF and others don't. Genetic factors predisposing to 'athlete's heart', with enlarged cardiac dimensions and a slow [heart rate](#), may be important as risk factors. And while it may be that prolonged endurance training over many years may not always be good for the heart, we do not yet have sufficient evidence to make specific recommendations."

More information: Grimsmo J, Grundvold I, Maehlum S, Arnesen H. High prevalence of atrial fibrillation in long-term endurance cross-country skiers. Echocardiographic findings and possible predictors. A 28-30 year follow-up study. *European Journal of Cardiovascular Prevention and Rehabilitation* 2010, 17:100, 8211105;

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