

Are There Harmful Effects Caused by the Silent Noise of Infrasound Produced by Windparks? An Experimental Approach

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Introduction: The increased number of wind parks raised the question, whether infrasound waves produced by wind turbines are harmful on human-beings, or not. Infrasound is a low frequency sound (< 20 Hz), undetectable with human ears. However, some people live near windparks describe unspecific symptoms i.e., palpitations, dizziness, headache, etc. This study analyses the infrasound effects on isolated atrial human myocardium and measures the contractile performance in human trabeculae using different frequencies and amplitudes of infrasound generated by a loudspeaker.

Methods: Human atrial trabeculae were resected from 8 patients undergoing aorto coronary bypass surgery, then demembranized using Triton X 100 and small fibers were generated with diameter < 0.3 mm and length 4–6 mm. The fibers were attached between force transducer and loudspeaker while activated at optimal length and room temperature in an organ bath using supramaximal calcium concentrations. Then infrasound was imposed using frequencies of 10 Hz or 20 Hz. Sound amplitudes (SA) were either 5% or 10% of tissue length (TL). Sound was applied for 1 minute. Force was measured before and after 1 minute of infrasound.

Results: Imposed infrasound on isolated human myocardium caused a direct force inhibition of the completely activated myocardial preparation. At 10 Hz and 5% TL (SA) force inhibition was 18.8±2% while at 10% TL (SA) up to 23.3±2% ($p < 0.05$). At 20 Hz; force inhibition was 23±2% at 5% TL and 32±4% at 10% TL ($p < 0.01$). After stopping infrasound; force was recovered but not to the initial value. No sound was heard during the experiments. Passive resting force was minimally affected (n.s.).

Conclusion: Infrasound can induce direct effects on human myocardium in the given experimental setting. Although mono-frequency sounds are not present in nature, our experimental data indicate, that direct effects on myocardial tissue are present. The infrasound influence on human tissue requires further investigation because the increasing number of a) wind turbines and b) human beings exposed by the neighborhood of windparks. Humans have no chance to protect themselves from the silent noise of infrasound, as long as no scientific data are present.

