

Extracorporeal Shock-Wave Therapy in Chronic Stable Angina Pectoris

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Introduction:

Extracorporeal shock wave therapy (ESWT) has generated great interest in cardiology since the first report of enhanced neovascularization by shock wave application at the tendon-bone junction in a dog model. Ischemic heart disease is the single leading cause of death in the industrialized countries and chronic stable angina pectoris is the most common manifestation of this disease. The treatment of choice is coronary revascularization, either by percutaneous coronary intervention or aorto-coronary bypass surgery. A substantial number of patients continue to experience precordial ischemic pain, either due to a lack of revascularization options or progression of the underlying disease. Alternative methods in the treatment of chronic angina are therefore warranted.

Methods:

In patients with chronic stable angina, the myocardial region of exercise induced ischemia is defined by myocardial scintigraphy. By means of ultrasound guidance, the focus of the shock wave generator can be directed to the region to be treated. In general, 200 shots with an energy of 0.09 mJ/mm² are delivered per spot. According to the area at risk, between 9 and 40 spots are chosen to scan the whole ischemic region at each session. The treatment is delivered in 9 sessions, 3 sessions grouped in 3 to 5 days, with a time interval of 4 weeks between the second and third 3 sessions.

Results:

The treatment is well tolerated by the patients and no increase in cardiac enzymes or arrhythmias have been noted. Canadian Cardiologic Society functional class and exercise capacity improved as well as the quality of life score of the Seattle Angina Questionnaire after a follow-up of 6 months. The amelioration of the clinical status after treatment correlated with improved myocardial scintigraphic perfusion images.

Conclusions:

In patients with chronic refractory angina ESWT is safe and well tolerated. It improves symptoms, exercise capacity and myocardial perfusion. The mechanisms by which shock waves promote perfusion are still unknown, but nonenzymatic nitric oxide synthesis and upregulation of VEGF mRNA expression might be some hints in favour of formation of new capillary networks.