Short Communication

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An Innovative way to cool the Crystalloid Cryoprotective Cardioplegic Solution during Open Heart Surgery.

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Abstract

A new crystalloid cryoprotective cardioplegic solution was invented in Turkmenistan in 2020, which can withstand cooling down to -5, -7 degrees. This is the first and only solution with a unique property to cool the myocardium to +5, +3 degrees at a minimum calculated dose of 7,5 ml/kg of patient weight. After clamping the aorta, the effect of the injection of this solution into the coronary arteries occurs in the first 35-40 seconds through bradycardia, after which a stable asystole occurs for more than 70 minutes. If it is necessary to extend the time of myocardial protection to 120 minutes, it is necessary to inject half the calculated dose of this solution. The restoration of the heart rhythm after removing the clamp from the aorta occurs within 3 - 4 minutes independently through bradycardia (junctional rhythm) or through high-wave fibrillation without cardioversion and the introduction of cardiotonics. This solution works due to the cryoprotective effect with conformational flexibility and sufficient refrigeration capacity. Histological examinations after 60 and 120 minutes of myocardial cardioplegia showed edema in 25% and 45% of cardiomyocytes, respectively. After 15-30 minutes of myocardial reperfusion (after removing the clamp from the aorta), the edema of the cardiomyocytes disappears. The method of cooling the crystalloid cryoprotective cardioplegic solution below 0 degrees and its composition are protected by patent No. 819 dated 02/18/2020. It is a simple, convenient, reliable and practical "cryoprocard" solution with an economical 500 ml package.

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Biography

Shatlyk Gurdov was interested in physics at a young age and was awarded a 1st degree diploma in physics among schoolchildren in 2004, and in 2003 - a 1st degree diploma in physics in a competition of projects (inventions) by the State of Turkmenistan. In 2014 he graduated the state Medical University of Turkmenistan and then he entered clinical resident of cardiovascular surgery of scientific-clinical Centre of Cardiology and then he entered clinical resident of cardiovascular surgery of scientific-clinical Centre of Cardiology. He began his perfusiology career under the guidance of Chachaev Begench. He worked for 2 years as doctor perfusiolog (cardiotechnik) with prof. Dr. Calin Vicol a German professor during his working visit to Turkmenistan.