Post myocardial infarction left bundle branch block disappearing with levosimendan

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A 51 year old man presented with a Killip III acute anterior myocardial infarction due to a very late thrombosis of a stent in the proximal left anterior descending artery. The EKG after being admitted to the coronary care unit following primary PCI showed a new onset left bundle branch block (LBBB) (Figure 1: A). In spite of the initial favorable evolution throughout the first two days under treatment with diuretics and ACE inhibitors, the LBBB persisted. During the third day congestive signs worsened, together with a reduction in diuresis and worsening of the renal function. At that point, treatment with 0.1 mcg/kg/min levosimendan perfusion was administered for 24 hours. During the first hours of perfusion the LBBB disappeared in the monitor and the EKG at the end of the perfusion showed narrow QRS with persistent ST elevation (Figure 1: B).

During hospitalization, rate-dependent bundle branch block was ruled out as the cause of the electrocardiographic changes. LBBB persistence despite the initial improvement in the clinical status of the patient and its vanishing during the first hours of levosimendan perfusion, suggest that those changes are neither due to other potential causes such as the infarction evolution nor the improvement in clinical status. However, there can be a possible correlation between levosimendan treatment and the disappearance of the LBBB.

Levosimendan is a calcium sensitizer inotropic agent which is known to activate \( K_{ATP} \) channel currents and shorten action potential in myocytes, especially in the ischemic tissue. Levosimendan has also shown to reduce atrial, ventricular and atrioventricular node effective refractory period. Resumption of AV conduction with levosimendan after ablation of AV node has been previously reported, increased activity of \( K_{ATP} \) and \( I_{CaL} \) channels by levosimendan was hypothesized to be the underlying mechanism. In the same way, the activation of \( K_{ATP} \) channel currents and therefore action potential shortening and effective refractory period reduction by levosimendan could be responsible for QRS narrowing in this case.

Statement of ethical publishing

The authors state that they abide by the statement of ethical publishing of the International Cardiovascular Forum Journal.

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References

Figure 1: A) EKG at admission to the CCU. B) EKG after levosimendan perfusion

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