Relationship between PQ interval and QT interval or cardiac function in patients with implanted DDD pacemaker.

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Atrioventricular (AV) delay optimization is important in patients with reduced cardiac function. As haemodynamic assessment by catheter examination is invasive, optimal AV delay is usually estimated by Doppler echocardiography, radionuclide angiography or plethysmographic impedance. However, automatic setting of the optimal AV delay can not be achived by these methods. When the sympathetic nervous system is activated during exercise, heart rate is increased and QT interval is shortened. In the initial observation, QT interval, at the same heart rate, was longer with DDD pacing than with VVI pacing when the QT interval versus heart rate relationship was examined. QT interval may be prolonged when the cardiac function is improved by optimizing the AV delay. We examined the relationship between AV delay and QT interval or cardiac function in patients with implanted DDD pacemakers. As the results, QT interval on the surface ECG is strongly influenced by the AV delay setting and changes in QT interval are closely related to changes in cardiac function. The optimal AV delay can be predicted as the AV delay at which the QT interval is maximal. QT interval has been used as the sensor for rate responsive pacing. Evoked QT intervals measured by an implanted pacemaker could be determined by a special pacemaker-software module downloaded into the pacemaker memory. Evoked QT interval sensed by the implanted pacemaker also changed according to AV delay variations. When AV delay was set to give the maximum evoked QT interval, cardiac output showed the maximum value. In conclusion, the optimal AV delay can be predicted as AV delay at which evoked QT interval is maximum. Automatic setting of the optimal AV delay can be achieved by means of the QT sensor of the implanted pacemaker.