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**Loss of physiological compensatory mechanism at the acme of stress test assessed in ischemic patients by RR, RT, QRS area time series continuous ECG recording.**

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**Background:** RR, RT intervals and QRS area (which gives information on ventricular filling) has been monitored during stress test in a previous study in a group of normal subjects. In this study minimum RT and minimum QRS area values occurred contemporaneously and were delayed respect to RR minimum value (see fig 1 top). This delay could represent separate effect of catecholamines on pacemaker cells in sinus node (able to modify R-R interval) and on ventricular myocytes (able to modify R-T interval and ventricular filling). This phenomenon appears as a compensatory physiological mechanism in normal subjects preventing reduction in ejection fraction as consequence of sudden decrease in heart rate.

**Aim:** Verify during stress test differences in profiles and in minimum values occurrence in RR, RT and QRS area time series in ischemic patients respect to normal subjects. **Method:** 30 ischemic subjects (28 males, 2 females, mean age 61 years) underwent to ECG stress

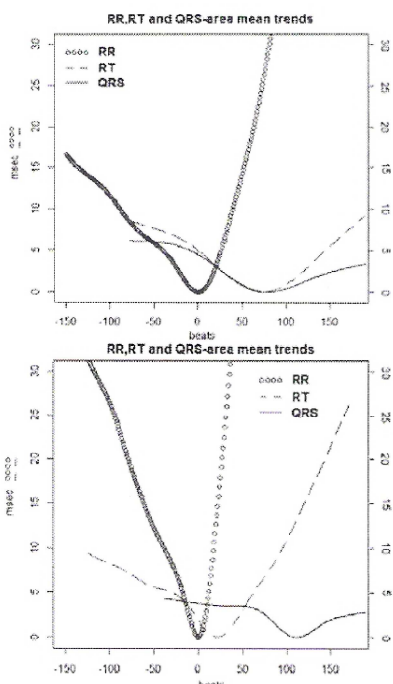


Fig.1 RR, RT and QRS area mean trends in 20 normal subjects (top) and in 30 ischemic patients (bottom). In ischemic patients RT minimum and QRS area minimum are split respect to normal subjects.

test performed, according to Bruce protocol. RT interval has been adopted instead QT interval as the latter is not reliable at rapid heart rates as T wave fuses with the ensuing P wave. We estimate the minimum location from the trend of RR, RT and QRS area time series. 20 normal subjects have been used as control group. Standard paired t-test of comparison of the means and generalized linear model to check the relationship between delay and the other variables : age, gender, hr, bp, mets, RR and RT slope have been used in two groups of patients.

**Results:** See Tab.1 and Fig.1.

**Conclusion:** Profiles and minimum values occurrence in RR, RT and QRS area time series in ischemic patients appear quite different respect normal subjects at the acme of stress test (Fig.1 bottom). We can assume that ischemic patients loss compensatory mechanism which allows in normal subjects to prevent reduction in ejection fraction as consequence of rapid decreasing in heart rate.

RR-RT mean delay (beats number)	p-value	RT-QRS mean delay (beats number)	p-value	RR-QRS mean delay (beats number)	p-value
70	1.567e-06	6	0.6228	73	9.872e-07

RR-RT mean delay (beats number)	p-value	RT-QRS mean delay (beats number)	p-value	RR-QRS mean delay (beats number)	p-value
28	0.003204	84	5.739e-05	112	1.275e-06

Tab.1 Diversely to normal subjects (top), ischemic patients (bottom) show a statistical difference in RT-QRS area minimum values occurrences.