Chronotropic incompetence - still on time to make a difference?

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Introduction: Chronotropic incompetence (CI) is prevalent among individuals with cardiovascular disease. This phenomenon is frequently noted in cardio-pulmonary exercise testing (CPET) in patients participating in cardiac rehabilitation (CR) programs and often attributed to a combination of factors, notably the administration of beta-blockers (BB).

Recent evidence casted doubt over long term beta-blocker use on ischemic pts with preserved ejection fraction and some large scale trials as BETAMI and DANBLOCK are undergoing to clarify BB role in this specific population.

Aim: This study aimed to evaluate alterations in the chronotropic response observed in consecutive patients undergoing CPET and to explore the impacts of BB on this physiological parameter.

Methods: We conducted a single centre, prospective study of consecutive patients who were submitted to CPET. CI was defined as chronotropic index (max HR-resting HR/predicted HR-resting HR)<0,8 and chronotropic deficit ((predicted HR-max HR)/predicted HR)<0,2.

Results: 446 patients were analysed (80,5% males; mean age of 6011; 83,4% ischemic patients) In our population, 95,8% had CI assessed during the CPET. 79% (n= 347) were under BB therapy, from which 68.3% (n=222) without heart failure with reduced ejection fraction. Most[ir1] pts used either low (bisoprolol 2,5mg or equivalent) or intermediate (bisoprolol 5mg or equivalent) BB dose (30% and 28,7% respectively). During a mean follow-up of 2,5±1,8 years, most pts (60,7%) maintained drug dosage, 8,7% increased and only 4,9% stopped.

The use of BB was associated with CI (p=0.002), chronotropic index < 80% (p<0.001) and with chronotropic deficit >20% (p=0.019). This was independent of the dosage of BB used. All of these pts were associated with a poorer exercise capacity as assessed by CPET and measured by VO2/kg, a known strong prognostic surrogate in this pts. There was however no significant difference regarding VO2/kg between pts with low or high BB dosage (mean 17.3 vs 17.8 mL/kg, p=0.513).

Conclusion: As mentioned, recent meta-analysis questioned the benefit for long term beta-blocker use on ischemic pts with preserved ejection fraction; indeed, most patients with preserved ejection were under beta-blocker therapy. In this subpopulation the rate of CI was similarly high and positively associated with BB use and lower values of oxygen consumption.

CI is highly prevalent in our population and it is directly related to BB use. Its broad use in pts with coronary artery disease and preserved LVEF is being questioned and those who display CI may be ideal candidates to halt this therapeutic.

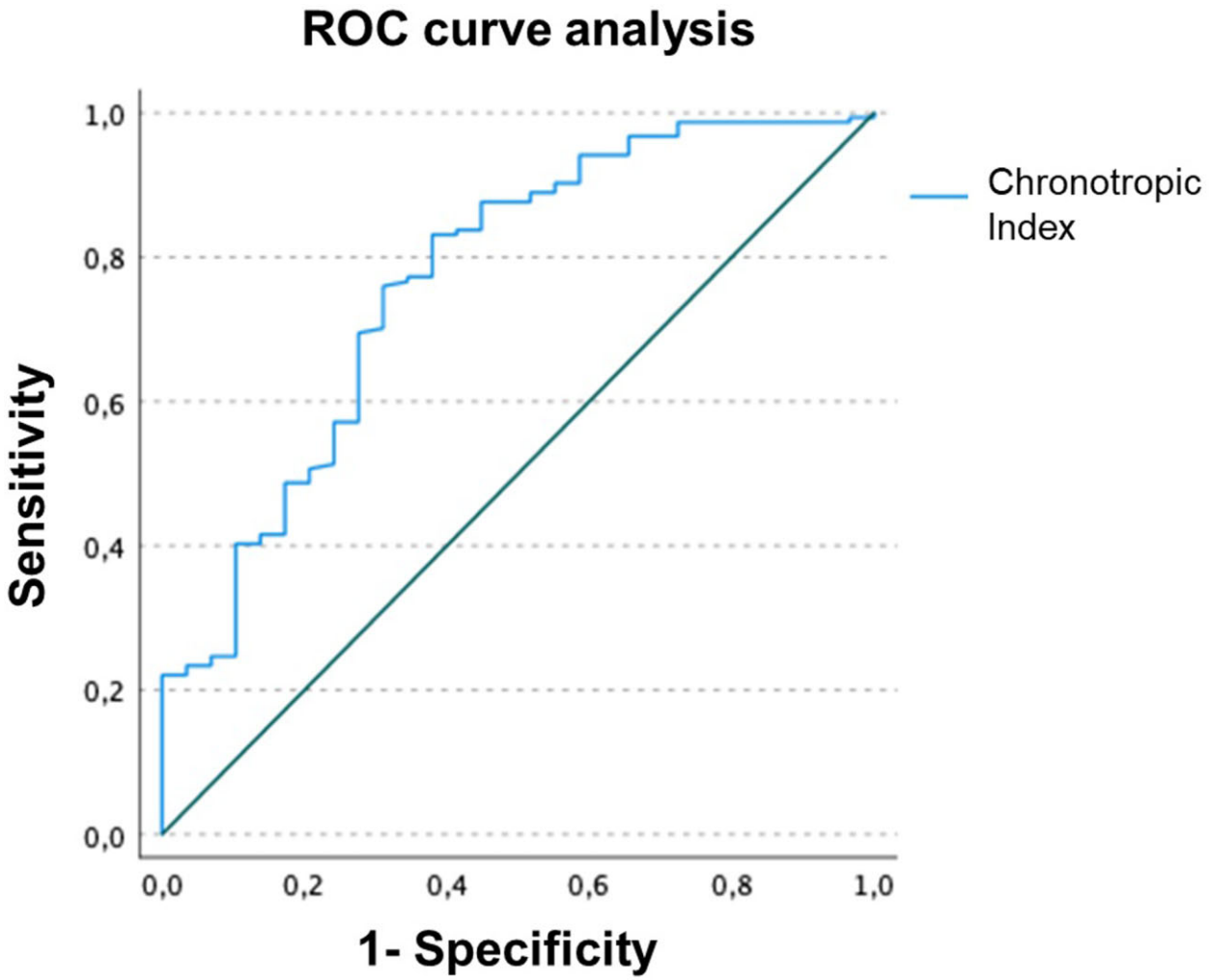

Figure 1 – Chronotropic index in discriminative ability for estimating a peakVO2 <12mL/kg/min, ROC curve analysis

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