Pacemaker therapy in the elderly patients

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The treatment of choice in symptomatic cases of patients with severe bradycardia remains the implantation of a pacemaker. In the Western countries, the increase in life expectancy, along with programs of universal medical assistance in the elderly has shown that implants of pacemakers are on the rise (32% implants in patients >80 year). Also, the high economic cost, associated to the electrotherapy has given rise to a great controversy, including the optimal selection of the way of stimulation, strategy of implantation and clinical benefit of pacemakers usage in patients of >80 years.

The high prevalence of cardiovascular disease in the elderly, entails that the rhythm disorders are very frequent in this age group. The clinical presentation can be various in many situations. Some cases of bradycardia may present without symptoms while others show a neurological predominance (light-headedness or syncope equivalent, confusion, awkwardness). Perhaps this must be accounted for by the existence of vascular disease and the greater vascular rigidity in the cerebral vessels of the elderly.

The co-existence of structural cardiomyopathy can be accompanied by greater or smaller hemodynamic repercussion. Frequently they are also using medication (aspirin, angiotensin-converting enzyme inhibitor, warfarin, etc.) which may alter the physiology of the situation. It is essential then to make a complete evaluation of the patient towards to diagnose of a possible structural cardiomyopathy which may ultimately affect the prognosis of these patients thus altering the decision for pacemaker implantation.

Survival

The long term survival of the patients with pacemakers has been poorly studied to date. After the implant of pacemakers in patients of >80 years, survival approximates 66% at 5 years compared with 37% and 47% of previous decades. In nonagenarians (90 years or older), the mean survival of patients after pacemaker implantation was 37.4 months (nearly 3.1 years). It appears that 76.4%, 51.8%, and 34.2%, respectively, were still alive at 1, 3, and 5 years after implantation (observational data, non published). Specific studies are not known, that analyze factors of mortal risk in this population. A previous history of equivalent syncope and masculine gender could affect their survival.

Stimuli modalities

Present technology allows the electric stimulation in either a single (ventricle or atrium) or dual chamber fashion. Single lead pacemakers are less expensive, easy to implant and monitoring. In addition, the battery is superior in length of life when compared with the dual chamber systems. Dual lead pacemakers preserve the atrial and ventricular stimuli as well as chronotropic response, thus presenting a more physiologic situation. However in the daily practice, the elderly patient is rarely benefits from the use of two-lead pacemaker technology. We have some information, with respect to survival according to the mode of stimulation. Although some retrospective studies suggest a greater survival with the dual chamber stimulation after 2 years, later retrospective studies like the CTOPP-trial, the MOST-trial, and recently trial UK-PACE, show that the selection of the mode of stimulation, single or dual chamber does not affect survival differences in elderly patients with atrioventricular block after 4 years of follow-up.

The frequency of atrial fibrillation appears greater in this population as well, particularly in those with disease of the sinus node during a relatively short period of observation (average 18 months). The appearance of atrial fibrillation, does not demonstrate an increase in mortality, functional impairment, stroke or hospital admissions.

Another aspect in these patients is the possibility of appearance of pacemaker syndrome that is lowered cardiac output related to the retrograde conduction (ventricle-atrial) during the ventricular stimulation. This has been described in as high as 26% of implants which may force the implanters to choose a dual chamber system over the single ventricular chamber mode. It seems that the dual chamber pacing stimulation in the sub-group of sick sinus syndrome, improves the quality of life when compared in the sub-group with atrioventricular block.

Ethical considerations

When symptomatic elderly patients are near the end
of their life, medical interventions become more complicated, expensive and probably less effective. Frequently clinicians may cast some doubts, on the mental capacity of the elderly, thus affecting clinical decision making. In this context, obtaining “informed consent” previous to any surgical intervention requires special considerations, different from that which is taken in the daily practice. Frequently the relatives of these patients must explain to the patient the ultimate prognosis and help them in their decision making. 10

Economic costs
Given the limited life expectancy that is displayed in these patients, the cost/benefit ratio for pacing has given rise to serious controversies as far as its “economic yield”. Schmidt, et al.17 reviewed a series of 1,588 patients of age >80, which revealed a cost by patient/year of = $500.00 US Dollars on the basis of 8 years average survival. This would then favor the aggressive usage of pacemakers in these octogenarians despite limited life expectancies.

Conclusion
We are observing a progressive increase in the number of elderly patients in whom pacemakers appear indicated. The life expectancy in these patients and the low cost of follow-up suggest that pacing therapy in elderly with symptomatic bradycardia be an effective and viable option. From a clinical point of view, the low complication numbers and reasonable costs make it prudent to treat these individuals just as we would if they were younger. The dual chamber stimulation would have to be considered in patients with sick sinus disease in the absence of atrial fibrillation which will result in the subjective improvement and quality of life.

References