Author's response to reviews

Title: Tinnitus in elderly patients and prognosis of mild-to-moderate congestive heart failure: a cross-sectional study with a long-term extension of the clinical follow-up

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Version: 3 Date: 13 February 2011

Author's response to reviews: see over
Dear Sir, I thank you very much for your kind review and for the suggestions that have greatly contribute to improve the manuscript.

Going to specific issues:

1. I agree with you that when you perform multiple t-tests there should be a correction for multiple comparisons to avoid the play of chance. This approach is mandatory if you perform multiple comparisons of the same data over time (e.g., "nominal level of significance"). In our paper we have made several comparisons in the same population and some of them involved variables with some degree of interaction. However, the interaction can be easily explained according with the pathophysiology and for this reason outside the play of chance. The results of the multivariate logistic regression analysis have been added and confirm a significant level of interaction with tinnitus for any of the measures of LV function and severity of heart failure.

2. I agree with your point of view that there could be some level of reciprocal interaction between tinnitus, age, hearing problems and CHF even whether the close correlation between the presence of tinnitus and the measures of LV impairment ad/or CHF would clearly support a relationship with the hemodynamic profile of the patients. In addition we did not find a correlation between the presence of tinnitus and the prevalence of audiological deficits and this greatly rule out the possibility that CHF is the consequence of a distress-induced situation caused by tinnitus. It is hard to believe that a severe disease as CHF could be affected by a sensory-neural disorder, particularly in presence of differences in the rate of hospital admission. However, a measure of presbyacusis (Bilateral loss > 30 decibels between 4000-800 Hz) has been added to the logistic regression without any change in the relative weight of significant variables.

3. The English expression has been revised once more and the paper has been double-checked by a professional translator.
Dear Sir I thank you very much for your careful review of the manuscript as well as for your interesting suggestions that have helped us to improve the paper.

Going to the specific comments:

1. First of all I thank you for your statement about the value of the study. Basically I agree with your interpretation of data and I am more than convinced that the presence of tinnitus is associated with some degree of hearing loss according to the mechanism you suggest. Our hypothesis is that the intensity of and severity of tinnitus can be related to a systemic hemodynamic derangement that has some influence on the inner ear circulation. The evidence that emerges from the cross-sectional analysis of the data is that the more compromised are the hemodynamic conditions the higher is the % of patients with tinnitus that does not exclude the possibility that the defect is caused by the pathophysiological mechanism that you suggest, but it can be exacerbated by the haemodynamic derangement. This would suggest that we might consider the possibility in the future and after a perspective study we are currently doing, to have the chance to use the intensity of tinnitus as indirect sign of ongoing heart decompensation. According to your point of view I have added the word “exacerbation of tinnitus”, “an exclusive role of a primary sensorineural...” and “activation or enhancement of the sensorineural mechanisms that produce tinnitus” where we discuss the relationship between CHF and tinnitus. In addition the Conclusions have been tempered according to what previously stated by suggesting that the paper is the first that support “a circulatory contribution to the onset of tinnitus in elderly patients with CHF...”, “the data support that the onset of tinnitus might be affected by the decline in LV function...”. I definitely hope that the changes can reconcile our hypothesis with your correct point of view.

2. As far as the problem of depression you are certainly right by emphasizing the importance of the depressive symptoms as a possible cause of tinnitus in patients with CHF. We are measuring the presence of depressive symptoms according to the DSM-IV criteria within an overall program of psychologic support to our patients and we do not find a difference in the prevalence of depression among the subgroups of patients with and without tinnitus. A sentence about the role of depression has been added to the manuscript. However our primary hypothesis was to demonstrate that LV dysfunction can affects the onset or severity of tinnitus regardless of the main causative mechanism that could be, of course, the high rate of depression according with you correct statement.

3. The Table 3 (ex-2) has been corrected