

Reply to letter to the editor “Blood pressure variability in primary hyperparathyroidism: more data needed”

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We are grateful to Dr. Antonelli for her comments [1] and interest in our work [2]. Current evidences suggest that 24-h blood pressure (BP) variability (BPV), including the average real variability (ARV) index, is predictive of cardiovascular outcomes independent of absolute BP levels [3]. So far, no data on BPV in patients with primary hyperparathyroidism (PHPT) have been available.

In our study [2] ambulatory BP monitoring-derived short term blood pressure variability was evaluated in selected patients with PHPT.

Concerning the first comment of Dr. Antonelli, we would like to specify that data were compared between PHPT and control group; an additional comparison was made between PHPT patients before and after parathyroidectomy. In fact, the first main finding of our study was that 24-h weighted SD and ARV of systolic BP were higher in normotensive PHPT patients than in normotensive controls (11.23 ± 3.63 mmHg vs. 8.5 ± 1.3 mmHg, $p = < 0.01$). The second main finding in our work was that 24-h ARV of systolic BP in the overall operated patients (normotensive and hypertensive) showed a reduction from 8.7 ± 0.8 mmHg to 7.5 ± 1.2 mmHg ($p = < 0.01$) at follow-up. Thus, analysis of ARV changes after parathyroidectomy was performed in overall patients regardless of baseline BP, since ARV is independent of absolute BP levels [3].

Non-operated patients were re-evaluated after a follow-up time of 1.9 ± 0.6 years. As shown in Table 4 [2], also in non-operated group there was a decrease, not reaching the statistical significance, in some variables, such as 24 h SD systolic BP and 24 h weighted systolic BP. These findings are probably related to the fact that all operated patients were treated with bisphosphonates with a consequent reduction in serum calcium (10.7 ± 0.87 vs. 9.6 ± 0.6 mg/dl $p = < 0.05$) while PTH values did not significantly change (112.8 ± 34.2 pg/ml vs. 109.7 ± 20.8 pg/ml, $p = \text{ns}$). In our view the reduction of some ARV parameters in non-operated patients at follow-up may depend on reduction in serum calcium levels. However, failure to achieve statistical significance could be related to the lack of variation of PTH values. This could suggest new pathogenetic perspectives in patients treated with PTH analogues.

Finally, the positive correlation between serum calcium and PTH values and 24 h AVR of BP was made for all PHPT patients, including operated and non-operated, since we believe that these variables are independent of BP values. Referring to Fig. 1 [2], Dr. Antonelli indicates that the correlation seems to be weaker when considering higher values of serum PTH: we believe that this observation depends on the small sample size of recruited patients, as reported in the *Limitations* paragraph. Indeed, we agree that further studies with larger cohort of subjects are necessary to confirm our results.

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Compliance with ethical standards

Conflict of interest The authors declare that they have no competing interests.

Ethical approval This study does not contain any study with human participant.

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