Letter to the Editor

To the Editor,

We have read with great interest the recent article by Portaluppi et al. [1] on the circadian rhythm of atrial natriuretic peptide (ANP) in normal subjects. The results are in agreement with our previously reported data [2-4], which demonstrated a statistically significant circadian rhythm, evaluated by cosinor method, for plasma ANP circulating levels in healthy subjects, maintained both in standardized [3, 4] and non-standardized [2] life conditions. The acrophase of ANP occurred at 1,00 (from 23.00 to 4.00), and the amplitude was about of 30% of mesor. Moreover, the maximum values of arterial blood pressure (ABP) were in antiphase with respect to the peak of circulating ANP levels [3, 4]. Consequently, our data and those of Portaluppi et al. [1] support the evidence of a definite circadian rhythm of ANP in normal subjects, without interference due to postural changes. These data suggest an inverse relationship between the circadian rhythm of ANP and the circadian rhythm of ABP, mediated by the effects of ANP on the renin-angiotensin-aldosterone system. In fact, we have demonstrated that the secretion of ANP, renin, and aldosterone seems to have a chronologic sequence [3, 4]. The increase in secretion of ANP, principally due to the increase in venous return during the night, determines lower levels of plasma renin activity (PRA) and plasma aldosterone (PA), by an increased natriuresis and direct inhibition of secretion of renin and aldosterone [5]. Successively, by lessening of the secretion and ending of the effects of ANP, which are of brief duration, one can observe an increase of PRA and PA, which follows an increase of ABP, also in relation to the increased sympathetic tone, in part ANP-induced [5].

A possible demonstration of the relationship between the chronologic sequence of ANP, PRA, and PA secretions could be the observation that in course of some pathological conditions, such as cirrhosis of the liver, a progressive derangement in the circadian rhythms of these variables, related to the stage of the disease, is present. In cirrhotics, besides having complete loss of secretory sequentiality, they also have secretory desynchronization of ANP and PRA, while the circadian rhythm is preserved in compensated patients, and lost in cirrhotics with ascites [6, 7].

We think that the instantaneous and circadian regulation of hydroelectrolyte balance and circulatory homeostasis may be under the control of a complex system, to which many factors contribute in different ways: principally ANP, PRA, PA, and the sympathetic nervous system. It is very difficult to establish the importance of each single variable. On the contrary, the ANP-PRA-PA axis [2, 6, 7] could be considered as a single chronobiological coordinate system that regulates the water and sodium balance and the ABP. Consequently, all of these relationships have to be taken into account in the evaluation of the circadian rhythm of ABP in normal and in some pathological conditions.

References


Domenico Colantonio, MD Paolo Pasqualetti, MD Department of Internal Medicine Chair of Medical Pathology University of L’Aquila Via San Sisto, 22/E 67100 L’Aquila (Italy)