

# “The old man and the sea”: elderly and environment in cardiovascular physiopathology

## Editorial

“He was an old man who fished”.....

The old man was thin and gaunt with deep wrinkles in the back of his neck. The brown blotches of the benevolent skin cancer the sun brings from its reflection on the tropic sea were on his cheeks. The blotches ran well down the sides of his face and his hands had the deep-creased scars from handling heavy fish on the cords. But none of these scars were fresh. They were as old as erosions in a fishless desert. Everything about him was old except his eyes and they were the same color as the sea and were cheerful and undefeated.” This excellent picture of Ernest Hemingway of an old worker in a typical environment with sea-climate is very interesting to be kept in mind in an attempt to clarify the relationship between environments, age and physical look with regard to the characteristics of all the diseases, which may affect human populations. Thus, it is worth noting that age and environment strongly influence cardiovascular system.<sup>2</sup> Older individuals often have a history of hypertension and diabetes mellitus generally associated with an increased risk of atherosclerosis.<sup>3,4</sup> The true significance of this pattern still requires more detailed studies to clarify respectively the role of these two parameters being that made more difficult by the fact that the significance of the age is often masked because of its association with sex in numerous papers.<sup>5</sup>

Generally, elderly recognizes some physiological patterns that relate to the previous lifestyle and differ from those of adults and adolescents, so that some reports, which analyzed cardiovascular risk factors, specifically passive smoking, associated with advanced age included this group of individuals among “special categories”.<sup>6</sup>

In the elderly, autonomic nervous system usually reduces its degree of stimulation with variation in heart and respiratory rate mainly due to the diminished vagal tone.<sup>7</sup> In addition, cellular and molecular changes consisting of arterial wall elastic fiber fragmentation and reduction with an increased collagen formation, and artery wall sclerosis characterize blood vessels of the older population. Therefore, cardiovascular system of elderly displays changes in its physiological and anatomical structure compared to that of the adult population. These age-related alterations commonly are responsible for reduced, although physiological, workload of the heart and such a condition makes an elderly heart more susceptible to the environmental injuries.

There is evidence that the environment according to its specific characteristics is a factor that can influence either positively or adversely cardiovascular system of all individuals, primarily the older population. An environment may be commonly defined as a complex structure where individuals with similar and, otherwise, different lifestyle play their activity, particularly modifying and organizing various events strongly related to their living habit, which often change the natural course of the environment itself.<sup>8</sup> Therefore, the natural environment, which should be not influenced by human activity, really does not exist, and a correct lifestyle is fundamental to prevent a large number of diseases by reducing morbidity and mortality of

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living subjects through the control of several pollutants, primarily industrial and smoking toxics.<sup>9,10</sup> An interesting paper<sup>11</sup> emphasizes that walking is the first and most useful step, well supported by the environmental characteristics, in cardiovascular disease prevention even in elderly. Unfortunately, a large number of old people cannot use this physiological feature well related to the environment because of disability due to current disease. Therefore, other means partly provided by the environment can help elderly people. Dietary and non-pharmacological, but also pharmacological, measures should be carefully taken into account for the advanced age, but working environment too, primarily for those older individuals in well-being, plays a favorable effect in an active maintaining this group of subjects.

Among non-pharmacological measures, dietary supplementation with vitamin C, E, and folic acid as well as antioxidants have shown to have protective effects towards cardiovascular ageing<sup>12</sup> primarily preventing endothelial dysfunction. In addition, a large number of antihypertensive drugs may be successfully used to control blood pressure,<sup>13</sup> although numerically a careful lowering of blood pressure is still of weak importance in view, also, of the existing systolic hypertension of elderly. With regard to the characteristics of the environment, there is a clear evidence of the beneficial effects due to sea-climate in some cardiovascular disease age-related. Thus, among these, hypertension seems to be favorably influenced by living at sea level. A recent paper<sup>14</sup> analyzed the response of blood pressure of the same group of older individuals, who were hypertensives and in pharmacological treatment, in the mountains and sea-level. Lower blood pressure at the sea level compared to that in the mountains occurred with statistical significance in both season's winter and summer. Indeed, this is a further proof of the beneficial result that a suitable environment exerts on cardiovascular health, particularly in elderly.

## Conclusion

Concluding with Hemingway,<sup>1</sup> “Up the road, in his shack, the old man was sleeping again. He was still sleeping on his face and the boy was sitting by him watching him. The old man was dreaming about the lions.” advanced age may be favorably influenced by the

characteristics of the environment, allowing the healthy older man to perform even heavy physical activity.

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