

Age-Related Dynamics, Gender Differences and Seasonal Biorhythms of Respiratory Diseases

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We have begun to study some epidemiological parameters, at first for disorders related to metabolic syndrome, already in 2005, however the great impulse to these studies was given by our participation in the Council of International Society for Developmental Origins of Health and Disease (DOHaD) since 2011. Fortunately, Brazil offers quite detailed epidemiological database called DataSus, available on the official site of Brazilian Ministry of Health. Nevertheless, we used it only partially, employing the data only for three Brazilian states of Southern region: Rio Grande do Sul, Santa Catarina and Parana, where there is the predominance of people with European origins. In addition, especially for seasonal rhythms it was important to evaluate the data from the extreme south of Brazil where seasonal differences should be the greatest.

Why DOHaD concept is so important? As a matter of fact, International Society for DOHaD (www.dohadsoc.org) is the only one that studies the whole ontogeny which includes both development and aging. Moreover, it uses the data of life-course epidemiology, as well as preclinical results obtained on experimental models for evaluation of mechanisms involved in perinatal programming / imprinting and postnatal embedding phenomena [1].

The results of our first evaluation of respiratory diseases [2] were published in 2011, however we are still engaged in the process of their discussion and interpretation, due to a number of aspects to be considered:

1. Age-related dynamics;
2. Gender differences;
3. Various chronological periods;
4. Different geographical regions;
5. Comparisons between several groups of diseases (for example, respiratory vs. cardiometabolic or neuropsychiatric disorders, in order to assess the extent of comorbidity) [3].

In brief, pneumonia appears to have two peaks of relative morbidity on both sides of the age scale, i.e. in the early postnatal and senescent age categories, probably because of immature and involuted immune system respectively. Moreover, for morbidity caused by bronchial asthma female predominance is significant, at least in some intermediate age categories. The opposite is true for mortality caused by pneumonia [4]. On the other hand, the peaks of morbidity and mortality caused by pulmonary tuberculosis occur in the intermediate age categories and are characterized by masculine predominance, probably due to associated AIDS [5]. By the way, only small differences were revealed between chronological age periods and Brazilian states evaluated.

What for seasonal biorhythms, excess winter morbidity was observed for chronic obstructive pulmonary disease, pneumonia and bronchial asthma, although this was not the case for cardiometabolic and neuropsychiatric disorders [6].

In conclusion, there are promising perspectives for continued studies of epidemiological parameters in respiratory and other diseases. Recently we were able to widen our research to Chile and Argentina that also have the predominance of people with European origins.

Preliminary data suggest quite similar patterns of age-related dynamics and gender differences in these countries, as compared to Southern region of Brazil, however with several important differences between them. Moreover, our recent results indicate the existence of clear-cut seasonal biorhythms of general mortality in the south of Brazil, with excess mortality also in winter, probably because of cold stress-induced decrease of immunity.

On the basis of our previous and recent data we would like to suggest that a focus should be made on early postnatal period of ontogeny, when some respiratory pathogens, especially in winter, can initiate the ontopathogeny of several disorders, perhaps including even those of cardiometabolic group. The use of glucocorticoids for treatment of several disorders in perinatal period can be considered also, from the point of view of programming/imprinting and embedding phenomena in DOHaD paradigm [7].

One of the aims of this Editorial is to attract some attention of potential collaborators in other geographical regions, especially from southern and central Europe, for the joint comparative studies of relative morbidity and mortality caused by respiratory and other disorders.

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