

DISEASES OF AGRICULTURAL WORKERS PREVENTION PROPOSALS

G. GRIECO, S. RUGGIERO, M. JACCARINO, R. NICOIS,
A. FERRARO, V. CIRUZZI and V. L'ABBATE

*Department of Occupational Medicine, Second Faculty of Medicine,
University of Naples, Naples, Italy*

ABSTRACT

The diseases among agricultural workers in two regions of Italy were studied. The authors investigated certain occupational diseases listed by the law currently in force in Italy, as well as labour accidents. Research was also carried out into the main unhealthy conditions not listed in the existing law both in relation to the environmental factors to which agricultural workers are exposed and in relation to working conditions in agricultures in general.

The various parameters considered were compared between groups of self-employed workers (farmers) and groups of dependent workers (wage earners). A relation to the pathology arising from mechanization of work is discussed. The study was completed with an investigation of the social environment in order to establish the relations between the health of agricultural workers and the social environment of the respective region. From the results obtained the authors make suggestions for the prevention of health impairment due to agricultural work pointing to the role that a different organization of agricultural work and a better ergonomic planning of the working tools could play in the prevention of diseases among agricultural workers.

A number of authors have noted the high incidence of various pathological processes in farmworkers, such as impairment of the locomotor apparatus, and respiratory diseases. Environmental conditions of micro- and macro-climate and work postures are usually regarded as ethiopathogenetic factors of these troubles. In our study we tried to contribute to a better definition of the role these factors play in this common pathology.

We therefore carried out an epidemiological investigation of the pathology of the active rural population of Lombardy and Campania, Italian regions with different patterns of climate, orography and social ambience. We made use of the statistic data of INAIL regarding work accidents in agriculture and, as regards common pathology, of the statistics of INAM concerning the cases of disease already reported. We also used the data obtained through direct observation.

The two groups of illnesses most frequent among farmers are osteoarticular and respiratory diseases (acute and chronic bronchitis), the latter having an incidence of 4.9% in Lombardy and 3.6% in Campania. The percentage of

osteoarticular diseases is 6% in Lombardy and 8.3% in Campania. We tried to explain the difference considering the etiopathogenetic factors of the diseases and analyse the social and ambient factors concerning the organization and methods of work. Therefore we used the following parameters: social factors (illiteracy, overcrowded housing, income per head), ambient factors (mean annual temperature and humidity) and work factors (degree of mechanization and typical postures at non-mechanized types of work).

In Campania, the illiteracy rate is 10.1% as compared with 1.1% in Lombardy. Lombardy is slightly less populated than Campania, and income per capita in Lombardy is more than double that in Campania. As for the relative degree of mechanization, the ratio is 2.5:1 in favour of Lombardy. In both regions farmworkers take the same posture for the same type of work.

The above data point to evident socio-ambient differences between Lombardy and Campania, and a ratio of mechanization of agricultural work clearly unfavourable for Campania. Correlating these data with the frequency of common diseases, we shall immediately notice the relation between these data and the incidence of acute and chronic bronchitis in the two regions. Among the etiopathogenetic factors of these diseases, we may mention those of environmental character. The effect of a cold and humid climate on the appearance of these diseases in subjects exposed to variable macro-climatic conditions is questionable. In our case, the different climatic conditions of the two regions coincide with the different incidence of respiratory diseases. However, as regards osteo-arthropathies we have an inverse relation. They are much more frequent in Campania than in Lombardy. If we break down the group according to the principal diseases statistically valued, we shall notice a clear prevalence of osteo-arthritis or primary chronic arthritis, which accounts for more than 50% of all the osteoarticular diseases we considered, without any significant variations between the two regions. In the range of osteo-arthritis spondylarthritis accounts for about 70% of all cases of osteo-arthritis. Thus osteo-articular diseases are more frequent in Campania than in Lombardy, with osteo-arthritis of varying etiology prevailing.

Some of the etiological factors of osteo-articular diseases are present everywhere. The same may be said about metabolic and endocrine factors and about heredity, all of which are equally distributed among the entire Italian population. Age and sex do not represent factors of differentiation, since in our research we considered equal age distribution in the two regions, and a similar composition regarding sex. What remains to be analysed are the climatic and traumatic factors. As regards the former, we think that a cold and humid climate promotes the development of osteo-arthropathies. However, comparing the climatic data of the two regions, we shall realize that this factor plays no major role. It clearly prevails in the region with notably better climatic-meteorological conditions characterized by a higher mean annual temperature and a smaller degree of humidity. Apart from this factor, the trauma factor is to be taken into consideration. Because of the evident disproportion of incidence we may exclude

acute trauma and consider chronic trauma. We, then, put the question: do conditions of chronic traumatism occur in workmen as a consequence of their working activity?

We know that even the slightest traumas (micro-traumas) if constantly repeated, cause degenerative changes on the articular cartilages and lead to changes in the whole articular complex. Micro-traumas develop if during work a certain gesture is constantly repeated for years or when it requires special force, or when its rhythm is too fast. Another determining factor may be the body posture at work. The agricultural worker is compelled to assume harmful postures for periods of time keeping his hands on the ground, his backbone flexed with a waste of considerable static energy owing to the contraction of his paravertebral muscles and the agonistic and antagonistic muscles of his whole body stretched out to keep the balance because of the forward movement of the barycenter. In the long run this posture causes considerable articular pain. Intensive compression at the level of the vertebrae and intersomatic discs results in a change of the trophism of the cartilage and consequently in velvetic degeneration, hypertrophy of the front longitudinal ligament and calcifications. In the intersomatic disc we may observe calcifications with the radiographic aspect of disco-arthrosis. However, as regards the articular intervertebral facies the changed play of interarticular pressures produces phenomena of a degenerative cartilaginous type, marginal osteophytotic effects and paraarticular calcifications. As regards coxofemorals and knees, altered statics lead to cartilaginous lesions particularly of the arthrosis type. In addition to static energy the work of hoeing and digging involves a dynamic component as well, the respective gesture being made with rapid and violent rotational movements and lateral inclination of the column. Thus, besides arthrotic alterations, there is a frequent possibility of disc herniation.

In this respect we may note that under the heading "osteo-arthritis" the INAM data do not comprise sciatica, which appears, however, in the nosological sector of nervous system diseases. These diseases occur in the agricultural population at a rate of 0.45% in the case of Lombardy and of 0.40% in the case of Campania. Thus sciatica is included among agricultural diseases with a microtraumatic component due to work.

On the basis of the results obtained from our study we may conclude that osteoarticular diseases are the most frequent non-occupational diseases of farmworkers, with chronic diseases accounting for the largest proportion (50% or more). Comparison of the findings in the two regions with different degrees of mechanization and different degrees of economic and social development revealed that non-occupational diseases are more frequent in the region with lower levels of economic and social development and mechanization. The climatic-metereologic factor does not appear to play a leading role as the cause of chronic osteo-arthropathies. Analysis of agricultural working methods and of the pathogenetic mechanisms of chronic osteo-arthritis points to the role of articular micro-trauma resulting from repeated gestures and body position at work. The prevailing percentage of chronic osteo-arthritis in Campania, which has a lower

level of mechanization than Lombardy, points to the important role of manual working operations.

Analysis and evaluation of the obtained data allow the conclusion that for certain types of work involving pathogenetic risks due to body posture at work, (such as hoeing and digging), the risk can be removed or sufficiently reduced through interventions in farm organization. This can be done through mechanization of manual, non mechanized operations which are carried out with the help of tools and which vary considerably from region to region, often even within the same region because of modifications inspired by local tradition. We believe, however, that tools which more or less extend the manual action must be designed ergonomically, so as to reduce postural, gestural and pathologic engagement. Meanwhile, we think that osteoarticular pathology deriving from work should form part of real occupational pathology since it involves specific risk. Its effects are irreversible and go beyond the pathology of the locomotor apparatus; it is enough to consider that they include a premature development of the "hypokinetic syndrome", i.e. the cause of premature ageing due to metabolic-circulatory disorders.