

Assessment of fitness for work in health care workers: biomechanical risk factors

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SUMMARY

In current practice the assessment of fitness for work in health care workers exposed to biomechanical risk factors is often based on conventional approaches rather than on evidence-based guidelines. However, an accurate evaluation of worker's psychophysical resources compared to job demand and potential occupational risk factors is essential in order to properly assess fitness for work. The latest published guidelines on the management of patients suffering from back pain reported that the evidence-based approach can minimize the period of inactivity by encouraging return to work (and to other non-dangerous physical activities) in a relatively short period of time. As for carpal tunnel syndrome, there is no scientific evidence supporting a restriction of physical activities requiring forceful movements of the hand/wrist.

RIASSUNTO

«Accertamento dell'idoneità lavorativa nei lavoratori della sanità: fattori di rischio biomeccanico». Nell'attività pratica del Medico del Lavoro la valutazione dell'idoneità alla mansione nel caso dei lavoratori della sanità esposti a fattori di rischio biomeccanico è spesso basata su un approccio convenzionale, piuttosto che su metodi di comprovata efficacia. Un attento esame delle capacità psicofisiche del lavoratore, confrontato alle richieste del compito ed ai potenziali fattori di rischio professionali è essenziale al fine di valutare correttamente l'idoneità alla mansione. Le linee guida più recenti sul trattamento dei pazienti con lombalgia riportano che l'approccio basato sulle prove di efficacia può ridurre il periodo di inattività, incoraggiando il ritorno al lavoro (e ad altre attività fisiche non dannose) in un tempo relativamente breve. Circa la sindrome del tunnel carpale, non vi sono evidenze scientifiche a supporto di restrizioni di attività fisiche che richiedono movimenti di mano e polso eseguiti con forza.

BACKGROUND

Assessing fitness for work can be a challenging task. Unfortunately, there are no shared interna-

tional standards on how to assess fitness for work since this practice is heavily influenced by national regulations. Moreover, the rationale of judgement is often based on expert-based guidelines or on tra-

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ditional ways of acting, rather than on consolidated evidence-based guidelines (19).

Exposure of the upper limbs and/or of the spine (mostly at the lumbar vertebrae level) to biomechanical risk factors is widespread in almost all working sectors, including the health-care setting (23).

The prevalence of low back pain has been widely studied in many different contexts; regarding nursing staff, a review of studies on musculoskeletal disorders (MSDs) conducted in 25 Italian hospitals reported a prevalence of low back pain ranging from 33% to 86% (10).

Less attention has been dedicated to work-related MSDs of the upper limbs; however, a high prevalence of upper limb disorders was reported among dental hygienists, surgeons, sonographers and endoscopists (5, 7, 13).

Since MSDs are often the main concern when dealing with fitness for work of health personnel performing manual patient handling, our attention will be focalized on them. Nevertheless, when assessing fitness for work, occupational physicians should always make a comprehensive judgment based on the overall health status of workers, taking into consideration the function of the musculoskeletal system as well as the integrity of other fundamental apparatuses, mainly the respiratory and the circulatory systems (24).

PROPER ASSESSMENT OF FITNESS FOR WORK

The best practice for assessment of fitness for work starts with a detailed analysis of the job task assigned to the worker, including its physiological and biomechanical requirements. To facilitate and specify this step in a concrete manner, it is suggested to create a structured classification of the job activities which will take account of the actual physical and physiological demands for each job task. For instance, Palmer and Cox (14) proposed a classification based on the job-titles defined in the Dictionary of Occupational Titles (22), according to frequency of execution and the energy demands of the job tasks involving biomechanical risk factors; as a final result, they outlined five profiles of

physical demand: sedentary activities; light work; medium work; heavy work; very heavy work.

The second step to assess fitness for work is to compare the worker's physical capabilities to the physical job requirements; this evaluation implies the appraisal of the worker's individual characteristics (such as gender, age, anthropometric profile) and of musculoskeletal or other occupational diseases. For this purpose Occupational Physicians have standardized tools available for the collection of MSDs and the evaluation of their potential impact on work ability.

The adoption of approved tools ensures the collection of high quality information and allows comparison between data collected in different contexts. The collection of standardized data is essential to monitor the temporal trend of MSDs and to provide evidence of the effectiveness of preventive actions.

Specific questionnaires are available for this purpose, including the Standardised Nordic Questionnaire (9), recently provided also in an Italian approved version (6).

If the presence of an MSD is detected, the subsequent disability should be assessed by quantifying the intensity of pain (e.g. adopting a visual acuity scale, VAS) (18, 20) and by characterizing it with specific tools such as the Roland and Morris Disability Questionnaire (RMDQ) (17, 20), the Oswestry Disability Index (ODI) (3, 16) or the Disabilities of the Arm, Shoulder, and Hand (DASH) (8).

The balance between the requirements of job tasks and the worker's capabilities is the rationale for assessment of fitness for work: if the capability of the worker matches the job demand, the worker should be considered fit for work. Otherwise the job tasks should be modified in order to meet the characteristics of the subject. If this balance is not possible, the worker should be considered "unfit for work" or "partially fit for work".

When dealing with acute diseases, the occupational physician is sometimes required to judge the worker as "temporarily unfit for specific tasks" or "temporarily unfit for work".

Periodic evaluation of the health status and work capability is necessary for early detection of condi-

tions that impose a change of the fitness for work judgment and/or of the job tasks.

MANAGEMENT OF SUBJECTS WITH LOW BACK PAIN

MSDs of the spine (in particular at lumbar level) have been associated with job activities involving biomechanical overload.

Back pain episodes are probably not always avoidable in a working population; ergonomic interventions are theoretically useful in controlling back pain incidence rates, but solid evidence supporting the effectiveness of specific interventions are lacking (2).

According to the most recent guidelines on the management of back pain patients (1, 21), the only evidence-based and strongly recommended approach is to minimize the inactivity period by allowing a short-term return to work (and to other non-dangerous physical activities), even if residual pain is still present. Hence, the rationale is to avoid long periods of inactivity that could facilitate the onset of a chronic disease.

The analysis of the international guidelines conducted by Staal et al. outlined a fairly good consensus on the management of back pain (21). At first, the physician should provide sufficient information on the self-limiting and benign nature of back pain; then, the patient should be encouraged to return to work. To enable this step to be taken, a temporary variation of the job tasks and of the working schedules might be necessary to avoid exacerbation of the symptoms. Possible actions include changes in manual material handling duties, avoidance of awkward postures, alternating standing and sitting positions. The American ACOEM 2010 guidelines make suggestions for several pathological conditions associated with low back pain, regarding both duration of absence from work and the required changes to work tasks (1).

For workers who return to work after a period longer than 2-12 weeks, a multidisciplinary rehabilitation programme (e.g. physical exercise, training, information, management of pain according to the principles of behavioural therapy) is suggested.

A judgment of “permanently unfit for work” or “permanently partially fit for work” should be considered necessary only in the presence of severe diseases of the vertebrae or joints that can cause a major disability and that are not compatible with safe physical activity.

The following conditions, for example, should require avoidance of physical activity involving high biomechanical loads: severe or evolutive scoliosis, ankylosis of the lumbar spine, outcomes of surgery for stabilization of lumbar or dorsal vertebrae, severe stenosis (primary or secondary) of the spinal canal associated with recurrent radiculopathy, Scheuermann’s disease (significant kyphosis and at least three wedge vertebrae), untreatable intervertebral lumbar disk displacement associated with electromyographic evidence of radiculopathy, ankylosing spondylitis or other severe inflammatory diseases involving the lumbar vertebrae, dimorphism of the lower limbs (amputations), joint replacement surgery, arthritis or other inflammatory diseases involving large joints and determining a severe reduction in mobility (50%), *osteogenesis imperfecta* and other congenital musculoskeletal diseases with significant functional impairment.

The traditional approach when assessing workers with back pain or other disorders of the spine was mainly based on the limitation of manually handled loads; the rationale for this practice was “common sense” rather than a critical appraisal of all available scientific evidence.

The concept behind the load limitation was that a diseased spine was considered to have altered biomechanical properties that could lead to damage to the vertebrae or other organs following manual material handling operations. Although this assumption seems biologically plausible, it should also be considered that a limitation of the maximum movable load could delay return to work if the job tasks are not adaptable (11, 15).

Moreover, the adoption of limitations aimed only at reducing weights is an inadequate approach that neglects other important causes of the actual biomechanical spinal load, such as the lifting height, the distance of the load from the body and the angular dislocation (Ferguson, 2005).

In the scientific literature shows there is no evidence supporting permanent restrictions of handled weight in workers suffering from back pain in the absence of anatomical alterations; the only evidence-based action is to adopt temporarily limitations: Ferguson suggested a period of three months (4).

The adoption of clinically-based practices in the management of workers suffering from back pain is a challenging process, sometimes contrasting with consolidated “common sense” practices; nevertheless, this radical change is essential to ensure the correct management of disabilities and to preserve working capacity.

MANAGEMENT OF SUBJECTS WITH THORACALGIA OR CERVICALGIA

Apart from lumbar spine MSDs, biomechanical overload has been suspected as a cause of diseases of the thoracic and cervical spine. Unfortunately, little evidence is available in the scientific literature for the management of workers suffering from these disorders.

However, as in the case of patients with back pain, also for patients with thoracalgia or cervicalgia it is recommended to provide sufficient information to the patients on the self-limiting and benign nature of the pain, which spontaneously disappears in more than 90% of the patients (1).

The patient should continue to perform normal working and daily activities. Bed rest should be avoided, while mobilization and stretching exercises should be suggested; the only exception is in the case of trauma with neurological involvement, in which early mobilization could represent a risk factor. As in the case of lumbar spine disorders, also for disorders of the thoracic and cervical spine the ACOEM guidelines suggest short duration of absence from work and possible changes to work tasks (1).

MANAGEMENT OF SUBJECTS WITH CARPAL TUNNEL SYNDROME

Many health care professions involve manual activities that could cause an increase in the pressure

inside the carpal tunnel, leading to the onset or the worsening of carpal tunnel syndrome symptoms. The symptoms could determine progressive functional impairment and could result in a decline of working capacity.

To reduce the disability and the economic costs associated with carpal tunnel syndrome and to preserve working capacity of health care workers, the following procedures should be adopted (12):

1. identification of the job tasks at high risk;
2. quantification of the functional impairment (both occupational and not);
3. identification of the subjects who require modification of job tasks to avoid symptoms worsening.

ACOEM guidelines recommend reducing exposure to working activities characterized by forceful movements, repetitive use of pinch force, and use of tools that transmit high frequency vibrations to the hand-arm system (1). Nevertheless, there are no high quality epidemiological studies supporting the effectiveness of the above mentioned procedure in producing a more rapid improvement in carpal tunnel syndrome symptoms.

CONCLUSIONS

Assessment of fitness for work constitutes the core activity for Occupational Physicians; it is also a key act in safeguarding workers from disability or functional impairment.

Work ability represents a value not only for enterprises but also for the whole society.

For health care workers, and in particular for those who are exposed to biomechanical risk factors, assessment of fitness for work is a challenging aspect and should be based on the best evidence available from the scientific literature.

As a final remark, it should be stressed that assessment of fitness for work should also be intended as a preventive action, and that its effectiveness in preserving health and work ability and reducing costs should be assessed also in the context of biomechanical risk factors.

Moreover, the adoption of standard and validated procedures to assess workers' abilities and the

application of widely accepted guidelines for the management of workers with MSDs should be encouraged, in order to ensure comparisons and to facilitate scientific research in this field.

NO POTENTIAL CONFLICT OF INTEREST RELEVANT TO THIS ARTICLE WAS REPORTED

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