

Job preservation by an office worker with idiopathic cervical dystonia: case report

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PAROLE CHIAVE: Disturbo del movimento; videoterminale (VDT); idoneità alla mansione; riabilitazione; ergonomia

ABSTRACT

Background: Work preservation is a main goal in the rehabilitation of chronic disabling diseases. We describe the application of an interdisciplinary protocol, involving the occupational physician, the occupational therapist and the ergonomist, in the case of a 50 year-old office worker with idiopathic cervical dystonia, a movement disorder that can seriously impair work capability. **Case report:** The disease was diagnosed at age 25, and subsequently worsened. The man presented postural difficulties and pain. The symptomatology worsened during working shifts, preventing him from doing his job properly. Functional evaluation and ergonomic inspection of the office environment led to the correction of evident critical inadequacies. This allowed the patient to continue working in correct conditions, resulting in improvement of his global health status. **Conclusions:** The interdisciplinary rehabilitative approach here described may allow subjects with idiopathic cervical dystonia to keep their jobs by adapting the workplace to the changed physical capabilities.

RIASSUNTO

«**Conservazione del lavoro da parte di un impiegato d'ufficio con distonia cervicale idiopatica: descrizione di un caso.** **Introduzione:** La conservazione del lavoro è un importante obiettivo nella riabilitazione delle malattie croniche invalidanti. È qui descritta l'applicazione di un protocollo interdisciplinare, coinvolgente il medico del lavoro, il terapeuta occupazionale e l'ergonomo, nel caso di un impiegato d'ufficio di 50 anni con distonia cervicale idiopatica, un disturbo del movimento che può compromettere gravemente la capacità lavorativa. **Descrizione del caso:** La malattia era stata diagnosticata all'età di 25 anni e successivamente peggiorata. Il soggetto presentava dolore e difficoltà posturali. La sintomatologia peggiorava durante la giornata lavorativa, impedendogli di svolgere al meglio le proprie mansioni. La valutazione funzionale del paziente e dell'ergonomia dell'ufficio mediante sopralluogo hanno permesso l'individuazione e la correzione di evidenti criticità. Questo ha consentito il mantenimento del lavoro, risultando in un miglioramento delle condizioni generali di salute. **Conclusioni:** L'approccio riabilitativo interdisciplinare qui descritto può consentire a lavoratori affetti da distonia cervicale idiopatica di mantenere le loro mansioni, adattando la postazione alle mutate capacità fisiche.

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INTRODUCTION

Dystonia is a movement disorder characterized by abnormal involuntary movements or postures, due to sustained or intermittent muscle contractions. Current clinical classification characterizes dystonia as isolated or combined (with other neurological or systemic signs). Most cases of isolated dystonia are caused by genetic alterations, or are of unknown aetiology (idiopathic dystonia). Depending on the regions of the body affected, dystonia can be subclassified as focal, segmental or generalized (1).

Isolated (idiopathic or genetic) dystonia may present during the first three decades (early onset) or later in life (adult onset). The natural history is that of an insidious appearance with a stable disease course once the symptoms are fully established, which typically occurs over months to years. Like other movement disorders, dystonia may lead to substantial disability and impaired quality of life, and seriously impair work capability (2).

Work preservation after the diagnosis of a disabling chronic disease is a main goal of the therapeutic and rehabilitative program. A well-timed and satisfactory return to work requires the expertise of both the ergonomist (workplace adaptation to the changed physical capabilities) and the occupational physician, who is able to analyse the task features (and the related risks), and to assess the job suitability of the individual workers based on their global health status. This interdisciplinary approach serves multiple purposes: to provide indications about working capabilities and modalities of job maintenance for both the general practitioner and the company physician; to minimize health risks and improve the compliance to prescriptions, allowing a safe and well informed return to work, based on the worker's residual capabilities (11, 12).

Apparently, no previous case report has documented the possible role of this integrated strategy in workers affected by idiopathic dystonia.

CASE REPORT

The present paper adheres to the CARE guidelines (9). The patient gave informed consent, and the

ethics committee of ICS Maugeri IRCCS approved the using of his clinical data (in anonymous form) for the present scientific report.

A 50 year-old male worker was referred to our Institute by his company physician for diagnostic in-depth investigations aimed at job fitness evaluation, in accordance to the Italian Legislative Decree n. 81/2008 (article 39, paragraph 5). The subject and his working environment were evaluated using an interdisciplinary protocol: occupational medicine, psychiatry, occupational therapy, and ergonomics.

Nothing relevant in family, physiological and remote pathological anamnesis. After completing his university studies (economy degree), the patient worked for four years as a nursing home educator. Since age 32, he was working as "center technician" at a national energy company which transports natural gas on Italian territory. The job mainly consisted in the management of eventual interferences on the pipelines by other subjects or companies (for example, earth moving for agriculture or subterranean works, construction of buildings). The activity was carried out exclusively in the office, full time, by telephone or e-mail, spending many hours at the video display terminal.

At the age of 25, following the onset of spasms in the neck, the patient was diagnosed with idiopathic cervical dystonia at another hospital, where intramuscular botulinum toxin therapy was started, with good control of symptoms. After seven years (more or less concurrently with the hiring at the gas company), this treatment became ineffective due to the appearance of neutralizing antitoxin antibodies. Since then, the patient has been on biperiden and clonazepam, with benefit. The clinical picture began to worsen from the age of 41, after a car accident (rear-end collision) that provoked a cervical sprain.

At the time of our evaluation, the subject complained of persistent involuntary cervical movements, with neck and shoulder ache. He reported that the symptomatology worsened during working shifts, with fatigue and difficulty in maintaining the sitting position, preventing him from performing his job properly. Physical examination revealed anteflexion of the head, laterocollis to the right, raised right shoulder, with painful contracture of the neck and shoulder muscles, bilaterally. Efficacy indicators

were: Barthel index 95/100; Neck Pain Questionnaire 36%; QuickDASH 27%; Tinetti balance scale 11/16; Tinetti gait scale 9/16.

The Barthel index is an ordinal scale (graded 0-100) used to measure performance in activities of daily living (ADL). Each performance item is rated on this scale with a given number of points assigned to each level or ranking. It uses ten variables describing ADL and mobility. A higher score is associated with a greater likelihood of being able to live at home with a degree of independence (6).

The goal of the Neck Pain Questionnaire is to find out how bad the neck pain is and how it affects the ADL or the ability to manage in everyday life. It is divided in nine five-part sections: 1) neck pain intensity, 2) neck pain and sleeping, 3) pins and needles or numbness in the arms at night, 4) duration of symptoms, 5) carrying, 6) reading and watching television, 7) working and/or housework, 8) social activities and 9) driving (not always applicable). At the end there's a tenth question which aims to compare the current state to the state when the questionnaire was last completed. Each parameter is divided in five answer possibilities with points from 0 till 4. Zero is significant for no pain and four is significant for worst pain. The minimum score is 0. The maximum score is 36 if all nine questions were answered, and 32 if only the first eight questions were answered. The percentage ranges from 0% to 100%. The higher the percentage, the greater the disability and the pain (5).

The QuickDASH (DASH: Disabilities of the Arm, Shoulder and Hand) is a 11-item self-report questionnaire (on a 5 point Likert scale) that looks at the ability of a patient to perform certain upper extremity activities. The score ranges from 0 (no disability) to 100 (most severe disability) (3).

The Tinetti test assesses gait and balance, as well as the perception of balance and stability during ADL and fear of falling. It has 2 sections: one assesses balance abilities in a chair and in standing; the other assesses dynamic balance during gait on a 5 m even walkway. The test has a gait score and a balance score. It uses a 3-point ordinal scale of 0, 1 and 2. The lower the score, the higher the risk of falling (14).

The working environment was inspected by a team composed of an ergonomist, a physiatrist with expe-

rience in occupational therapy and an occupational physician. Both the general work environment and the specific workstation of the patient (performing his ordinary duties) were examined, making measurements and photographic surveys. The assessment revealed several inadequacies, schematized in Table 1. In particular, the patient was sitting at the computer screen with the body turned to the left, to compensate for the right laterocollis (Figure 1). This prevented him from resting his back properly on the chair, and his forearms on the desk surface. In addition, he did not have enough space for the lower limbs, and no footrest (Figure 2A). In accordance with the employer and the company physician, the workstation was redesigned, with several ergonomic adjustments (Table 1).

The subject was provided with a personalized work desk and chair, with the computer positioned on the right (Figure 2B), allowing him to adequately rest his back and limbs. He was confirmed fit for the job, with the prescription to introduce frequent rest breaks during the working day.

At six months follow up, the subject reported improvement of symptoms, and good adaptation to the changed working conditions. Efficacy indicators were: Barthel index 95/100; Neck Pain Questionnaire 27%; QuickDASH 18%; Tinetti balance scale 11/16; Tinetti gait scale 9/16.

DISCUSSION

The case described here confirms that idiopathic cervical dystonia is a disabling disease which may seriously impair both the quality of life and work fitness. In particular, the patient was affected by disabling neck and shoulder pain, as confirmed by the Neck Pain Questionnaire (36%) and QuickDASH (27%) scores, as well as by balance and gait difficulties, as demonstrated by the Tinetti test.

Full onset of the symptomatology is typical at 40-50 years of age, affecting workers in the middle of their professional career, with consequent reduction in productivity and eventual job loss. Social and psychological factors are important determinants of disability. Continuing to work after the onset of the disease, in addition to allowing self-realization and social relationships, is associated with milder reports

Table 1 - Workplace ergonomic adjustment

	Critical issues	Corrective actions
General (in relation to common ergonomic practice)	Furniture arranged chaotically, with insufficient space between the different workstations	Furniture rearrangement
	Excessive lighting	Screening of windows
	Incorrect positioning of the computer screen with respect to the windows	Correct screen orientation
	Telephone, keyboard and mouse placed too far and on inadequate surfaces	Repositioning (max. distance from desk edge: 34 cm)
	Space under work surface partially occupied by an electric heater, with insufficient room for lower limbs	Heater removal
	No footrest	Two adjustable footrests, one for each foot (width: 30 cm; height: 2-23 cm)
Specific (in relation to the particular conditions of the worker)	Desk shape inadequate to the worker's forced posture	Custom made desk
	Seat inadequate to the subject's anthropometry and posture; height and inclination not adjustable; inadequate support for back and neck	Custom made ergonomic chair (width: 43 cm; depth: 33 cm)

of pain and depression, regardless of the severity of the disorder (2).

A number of studies have evaluated the impact of cervical dystonia on employment status. Jankovic et al found that 23% of 300 patients with this movement disorder were unemployed because of their disability (4). In a group of 220 subjects affected by the same illness, 17% experienced qualitative and quantitative changes at the occupational level (10). In another study of 1038 patients, 38.5% of those who were employed at the onset of symptoms quit the job due to the cervical disease. Moreover, 26.0% of those who were still able to work experienced some changes at employment level, 29.8% lost working days in the previous months, and 57.8% reported reduced productivity (7).

Botulin toxin therapy is usually effective in controlling the symptoms of cervical dystonia, and may

be useful for the preservation of working capability. In particular, this treatment reduces the number of days of sick leave, and it is more effective than oral medication in improving employment status, probably by virtue of a better pain control (13). A frequent drawback is the development of neutralizing antitoxin antibodies, as in the case reported here.

Our previous experience clearly indicated that the collaboration between rehabilitator and occupational physician is very useful in promoting the resumption of work in patients with outcomes from osteoarticular injury or cardiac disease, adapting work activities to changed physical abilities. This interdisciplinary approach rises from the need to provide both the company physician ("medico competente" ex Italian Legislative Decree n. 81/2008) and the general practitioner with an objective assessment of the work ability of patients who have



Figure 1 - Patient at his work desk: compensatory rotation of the body to the left

suffered disabling injuries or diseases, and at the same time identify reasonable adjustments useful to allow return to of work. Our Institute achieved significant results in the high percentage of patients who returned to work and in the relatively short time needed to complete the resumption process (11, 12).

In the work maintenance process, occupational ergonomics plays a complementary role between rehabilitation and medical disciplines in improving the safety and well-being of workers in compliance with performance and production objectives.

The main contribution of ergonomics concerns the adaptation of the workplace, the modification and reorganization of activities and the use of technological aids and devices. These combined interventions minimize failure in the reintegration process and reduce the risk of injury and development of further disability (8).

Office and computer work requires visual effort and maintaining a seated position for many hours, often without interruption. In addition, the use of the mouse and keyboard requires continuous typing, with micro-movements and pressure exerted by hands and wrists. In the case presented here, the initial arrangement of the workstation was not adapted to the subject's disability. Postural difficulties and pain prevented the work from being done comfortably, causing exacerbation of symptoms. Ergonomic evaluation of the working environment was fundamental in identifying and correcting evident inadequacies. The suggestions for corrective measures were promptly implemented by the company, being simple and relatively inexpensive. This intervention allowed the patient to continue doing his work in good ergonomic conditions, without deteriorating his health and with an improvement in general well-being, as confirmed by the better scores on the Neck Pain and QuickDASH questionnaires.

CONCLUSIONS

This report indicates that an interdisciplinary protocol involving the occupational physician, the

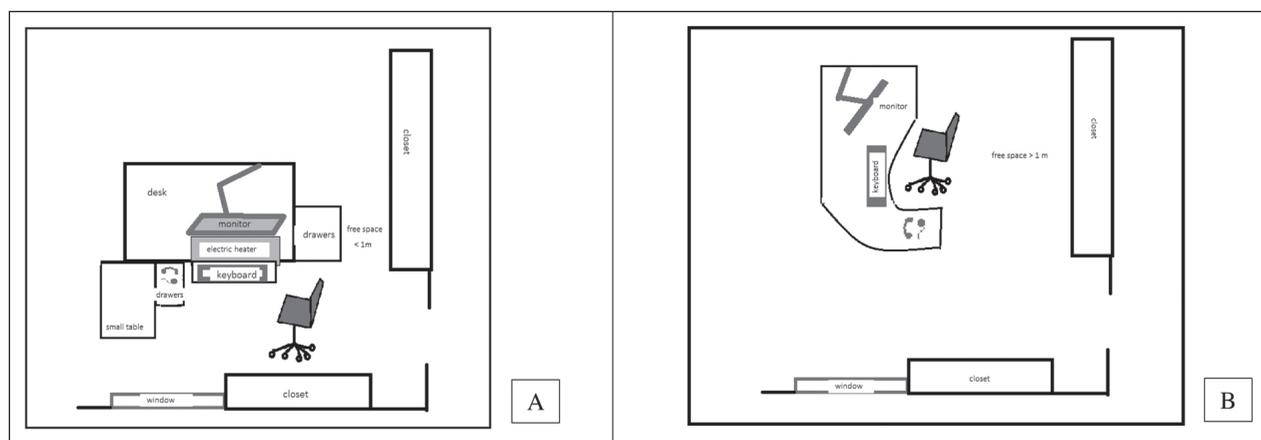


Figure 2 - Workplace design, before (A) and after (B) ergonomic correction

occupational therapist and the ergonomist may allow job preservation by subjects with idiopathic cervical dystonia, adapting the workplace to the changed physical capabilities. Following this strategy, such patients can continue to work satisfactorily, with improvement of their symptoms. The application of efficacy scales can be useful for the functional assessment, before and after the ergonomic intervention on the workplace.

A single case is not sufficient to provide clear evidence for the usefulness of the described approach. Studies on other similar patients are needed in the future to confirm our uncommon preliminary observation. However, the experience documented in the single case described, which demonstrates the real possibility of making a workplace suitable for a worker with cervical dystonia, may serve as a reference for the resolution of other similar cases.

REFERENCES

1. Albanese A, Bhatia K, Bressman SB, et al: Phenomenology and classification of dystonia: a consensus update. *Mov Disord* 2013; 28: 863-873
2. Girach A, Vinagre Aragon A, Zis P: Quality of life in idiopathic dystonia: a systematic review. *J Neurol* 2019; 266: 2897-2906
3. Gummesson C, Ward MM, Atroshi I: The shortened disabilities of the arm, shoulder and hand questionnaire (Quick DASH): validity and reliability based on responses within the full-length DASH. *BMC Musculoskeletal Disorders* 2006; 7: 1-7
4. Jankovic J, Leder S, Warner D, Schwartz K: Cervical dystonia: clinical findings and associated movement disorders. *Neurology* 1991; 41: 1088-1091
5. Leak AM, Cooper J, Dyer S, et al: The Northwick Park Neck Pain Questionnaire, devised to measure neck pain and disability. *Br J Rheumatol* 1994; 33: 469-474
6. Mahoney FI, Barthel D: Functional evaluation: the Barthel Index. *Md State Med J* 1965; 14: 56-61
7. Molho ES, Stacy M, Gillard P, et al: Impact of cervical dystonia on work productivity: an analysis from a patient registry. *Mov Disord Clin Pract* 2016; 3: 130-138
8. Niu S: Ergonomics and occupational safety and health: an ILO perspective. *Appl Ergon* 2010; 41: 744-753
9. Riley DS, Barber MS, Kienle GS, et al: CARE guidelines for case reports: explanation and elaboration document. *J Clin Epidemiol* 2017; 89: 218-235
10. Rondot P, Marchand MP, Dellatolas G: Spasmodic torticollis – review of 220 patients. *Can J Neurol Sci* 1991; 18: 143-151
11. Scafa F, Calsamiglia G, Cadei P, et al: Salute e lavoro dopo procedure invasive cardiache, riabilitazione e valutazione occupazionale: studio prospettico pluriennale. *Med Lav* 2018; 109: 219-224
12. Scafa F, Dondi E, Panigazzi M, et al: Work resumption after occupational osteoarticular injury: interdisciplinary protocol and case record. *Prevention & Research* 2013; 3:302-308
13. Skogseid IM, Roislien J, Claussen B, Kerty E: Long-term botulinum toxin treatment increases employment rate in patients with cervical dystonia. *Mov Disord* 2005; 20: 1604-1609
14. Tinetti ME, Williams TF, Mayewski R: Fall risk index for elderly patients based on number of chronic disabilities. *Am J Med* 1986; 80: 429-434

NO POTENTIAL CONFLICT OF INTEREST RELEVANT TO THIS ARTICLE WAS REPORTED BY THE AUTHORS

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