

MULTIPLE CHEMICAL SENSITIVITY – TWO ILLUSTRATIVE CASE REPORTS

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ABSTRACT

Multiple Chemical Sensitivity was first proposed as a disease entity 50 years ago and, although still surrounded by controversy, is increasingly being accepted as such. The condition is also known as Idiopathic Environmental Intolerance. It is a chronic disease in which low levels of chemicals invoke a multiplicity of unrelated symptoms. The cause is not known but the condition will present to physicians, allergologists, ear, nose and throat surgeons and, most especially, occupational health practitioners. Symptoms may be mild or totally disabling, and multiple organs may be affected. No objective or measurable features aid the diagnosis and no definitive management options are available. Two case histories are presented which conform to the criteria that were established in 1999 and modified in 2005. In both cases the condition caused severe disability, with devastating consequences for the sufferers, especially their ability to continue working. This article aims to bring the existence of this condition to the attention of health practitioners.

INTRODUCTION

Multiple Chemical Sensitivity (MCS) as a disease entity was proposed 50 years ago and has elicited scepticism from scientists amid much controversy. It is described as a chronic condition with multi-organ symptoms that occur in response to exposure to a range of chemicals. Symptoms include headaches, burning eyes, nose or throat, concentration or memory lapses, nausea, muscle pain, dizziness, breathing problems and fatigue. The disease is debilitating and causes social isolation and hardship. Because the symptoms are subjective and there are no objective signs of disease or of allergy, the diagnosis is difficult. No adequate treatment is available.¹

BACKGROUND

Germany was the first country *formally* to recognise MCS, and in 2000 classified it with an ICD-10 code (T78.4) as a physical disease associated with an unspecified allergy. Austria, Luxembourg and Japan followed suit.² Denmark and Switzerland followed in 2010 and 2012, and Spain in 2014.³ The United States, Canada and South Australia recognise MCS as a disabling occupational condition and it is therefore compensable.⁴

Although MCS is not specified as an occupational disease in South Africa under Schedule 3 of the Compensation for Occupational Injuries and Disease Act 181 of 1993, and is therefore not readily accepted by the Department of Labour as a compensable work-related condition, both the cases presented were accepted by their professional insurance

company as having a disabling disease and were granted disability pensions.

The consensus criteria for the definition of this condition, established in 1999 and still recognised, are these:⁵

- It is a chronic condition.
- Symptoms recur reproducibly.
- Multiple organ systems are affected.
- It occurs in response to low levels of exposure.
- Multiple unrelated chemicals seem causative.
- Symptoms improve or resolve when incitants are removed.

These criteria were modified by Lacour et al in 2005,⁶ as follows:

- It is a chronic condition lasting more than six months and causing a deterioration of lifestyle and bodily functions.
- Symptoms recur reproducibly and affect the nervous system, with a characteristic hypersensitivity to odours.
- The central nervous system and at least one other organ system is continuously involved.
- Responses are induced after low levels of exposure.
- Responses are to multiple unrelated chemicals.
- Symptoms improve or resolve when incitants are removed.

In 1996, the International Programme on Chemical Safety (IPCS) held a conference at which the preferred term

TABLE I: EXPOSURES COMMONLY CAUSING SYMPTOMS IN PEOPLE WITH MCS (ADAPTED FROM CARESS & STEINEMANN¹¹ AND MAGILL & SURUDA¹³)

TYPE OF EXPOSURE	SPECIFIED AGENTS
Cleaning agents	Tile cleaner, floor cleaner, furniture polish, dry-cleaning fluid, laundry detergent
Pesticides	Insect repellents, insecticides
Perfume	Cosmetics, shampoos, aerosol deodorants, air fresheners, aftershave lotion
Tobacco smoke	Cigar and cigarette smoke
Car/diesel exhaust	<i>Exhaust emissions</i>
Beauty salons and barber shops	Nail polish, nail-polish remover, hairspray, shampoos
New carpets or furniture	<i>Volatile organic compounds</i>
Fresh ink	Marker pens
Other industrial agents	Asphalt, tar odour from road or roof, oil-based paint, varnish, shellac, lacquer, paint thinners, chlorine in water

Idiopathic Environmental Intolerance (IEI) was proposed since the term MCS implies a causal relationship with chemicals that has not been established.⁷ IEI has been defined as:

- an acquired disorder with multiple recurrent symptoms;
- being associated with diverse environmental factors tolerated by the majority of people;
- not explained by any known medical, psychiatric or psychological disorder.

Despite the consensus decision, MCS is still the term most used to describe this complex syndrome.

The aetiology is unknown and whether exposure to chemicals is the actual cause is doubted, although a number of different theories have been suggested.⁸ Broken down into concepts, these include:

- disruption in immunological or allergic processes;
- an alteration in nervous system functioning;
- changes in biochemical or biotransformation capacity;
- changes in psychological or neurobehavioural function.

Immunological and allergic processes seem the least likely to be causative. Several avenues of investigation are being explored. Pall^{9,10} postulates elevated nitric oxide levels activated by organic solvents that cause neural sensitisation whereas Bell et al postulate dysfunction of the olfactory–limbic system.

Of 120 patients with MCS examined in an environmental medicine department, the authors found that in 100 (83%) of these at least one psychiatric diagnosis was made.¹⁰ The authors concluded that many of these patients suffer from somatoform disorders but also from other well-known psychiatric conditions.

The prevalence of this condition varies with its definitions and is uncertain. Among a randomly selected sample of 1 582 respondents from the general population in a geographical area in metropolitan Atlanta,¹¹ 199 (12.6%) reported hypersensitivity to common chemicals and 49 (3.1%) reported that they had actually been diagnosed with MCS.

Moreover, 29 (13.5%) reported losing their jobs because of hypersensitivity. The authors concluded that both men and women are affected, although women make up the majority of patients (more than 70%). The condition was reported by individuals of different ages and educational levels.

Among general cohorts of Gulf War veterans, the rate of chemical sensitivity was reported to be 36–38% and the rate of MCS was 2–6%.¹²

Exposures most commonly reported as causing or triggering symptoms are listed in Table I.

Many and varied symptoms involving multiple organs have been described in the literature.¹⁴ Some of those more commonly reported on are listed in Table II. It is the vagueness of the symptoms experienced, and their variety and seeming unrelatedness, that *are* important and that should alert the clinician to MCS. The symptoms are unique to each person and do not seem to be precipitated by any specific exposure.

In this article, two cases of MCS are presented. An insurance company referred both of them to a dermatologist working

TABLE II: SYMPTOMS FREQUENTLY REPORTED BY PATIENTS WITH MCS

Neuropsychological	Fatigue
	Difficulty concentrating
	Depressed mood
	Memory loss
	Weakness
	Dizziness
	Headaches
	Heat intolerance
Ear, nose and throat	Dry mouth, sore throat and nasal congestion
Respiratory	Shortness of breath
	Difficulty breathing
	Coughing
Skin	Irritation and redness (not documented by doctor)
Miscellaneous	Arthralgia, chest and abdominal pains

in an occupational setting for disability assessment. Both had consulted many medical practitioners. The first case had been eventually diagnosed with MCS by an occupational health practitioner.

The aim of this presentation is to bring the existence of this condition to the attention of medical practitioners in South Africa.

CASE PRESENTATIONS

Case 1

The patient was a 48-year-old woman. She worked as a dentist in private practice and had rooms at her home. She had worked as a dentist since 1984 and as such was in contact with many chemicals – especially acrylates. The consultation with this patient was prolonged and the information conveyed confusing and difficult to correlate.

She stated that her 'allergic problems', as she believed them to be, had started in 2005 after she had been exposed to glass ionomer cement, a material used in dental fillings that is a combination of silicate and polyacrylate cement system and which may also contain acrylate monomers. She had an 'acute reaction' and 'felt terrible'. Thereafter, she experienced intolerance to all smells, not only those in the work environment, and this persisted until the consultation.

She described having blocked ears, a thick sensation in her head, sleepiness, tiredness, memory loss, difficulty with concentrating, stiffness, loss of sensation, difficulty with seeing, a tight chest and a 'gevoel van benoudheid' (feeling of anxiety). She was examined by medical practitioners, homeopaths and physicians. She was tested extensively for allergies: patch tests and the Cellular Allergen Stimulation Test (CAST); the Memory Lymphocyte Immunostimulation Assay (MELISA) tests using various dental materials were negative. However, for the duration of the patch tests (48 hours), she complained of a burning mouth, weak muscles, rash and sore joints. She was diagnosed as type 1 urticaria on the basis of her symptoms but the reactions were not witnessed. She was prescribed oral steroids and a Ventolin® inhaler, which were ineffective. At this time she stopped working in her rooms and employed a locum. However, she found the smell intolerable even though she did not go into the consulting rooms. She got rid of all the dental materials and had the offices thoroughly washed. Nonetheless, when she went near them, she experienced the same symptoms.

If exposed to any smell, such as occurred when she passed a nail bar in a mall or when she bought new, varnished furniture, the symptoms recurred. She bought a new house and moved away from her home and rooms.

The diagnosis of MCS was made by an occupational health practitioner. The condition caused her disability such that she was unable to continue with her chosen profession. She

has continued to suffer in her normal life in spite of no longer being exposed to dental materials.

Case 2

A 64-year-old man had worked as a pharmacist since 1969 and as a manufacturing pharmacist since 1989. He was in contact with a host of different chemicals and was forced to retire in 2009 on account of his symptoms.

He stated that he was allergic to penicillin and also to cut grass prior to the onset of the MCS. He had never suffered from asthma, hayfever or flexural eczema.

He developed his problem in 2006 and dated the onset of his condition from exposure to turpentine. He developed 'sensitivity' to various drugs with which he worked. He listed them as Zithromax®, Taquin®, Antistine-Privine®, Tobrex®, Vita-thion, estomycin (erythromycin) and herbal medications. In addition, he found perfumes worn by women, mosquito repellent, citronella, solvents, paints, toluene, theatrical smoke and ammonia intolerable.

His symptoms were vague, many and incapable of being clearly attributed to a single cause. They included red rashes, a tight chest, coughing and a hoarse voice, irritation of his upper respiratory tract, itch, erythema and distress. He also suffered from headaches, aches and pains. His symptoms resolved over weekends, only to recur on returning to work on Mondays.

He had consulted a number of practitioners, including a pulmonologist, who could find no abnormality. The total IgE and the radio-immune test (RAST) for inhalants (Phadiotop®) were normal. He was patch tested with the European standard series of allergens and these were unreactive.

The diagnosis was MCS from the chemicals that he was exposed to both at work and in his city environment. He was disabled in that he was unable to continue in his occupation. After retiring in 2009, he continued to experience symptoms in the city suburbs in which he lived. He moved to live with his son in the Bushveld, where there were no triggering smells and he was able to live normally and contentedly.

DISCUSSION

What was striking about these two cases was the similarity between them. Both individuals were highly skilled professionals who had worked for many years in their professions and felt forced to stop working against their will.

The consultations were long and confusing and there was no recognisable pattern to the multiple symptoms involving many organ systems which they described. Both displayed great distress and discomfort. In a long and circuitous submission, Case 1 pleaded: 'Help my asseblief om hierdie nagmerrie in my lewe af te sluit.' ('Please help me to end

this nightmare in my life.’)

Both had been extensively investigated for physical disease and especially for allergy, with negative results. Both described an aversion to a wide variety of odours. Neither had cause to malingering; both had retired before their consultation. The differential diagnosis includes various psychiatric disorders, since in some of the literature MCS is regarded as a special subgroup of somatoform disorder.¹⁵ Physical disease and allergy had been excluded through extensive investigation prior to the consultation.

Both patients fulfilled the Lacour criteria for the diagnosis of MCS:

- Symptoms in both patients had persisted for many years and both found their lives intolerable. Many of their symptoms were similar to those described in the literature (see Table II). However, they were vague and legion and peculiar to each person. Neither was able to continue working.
- Both patients, on exposure to various chemicals, complained of the odour that caused discomfort and of numerous somatic complaints.
- They experienced psychological distress as well as headaches, non-specific aches and pains, and respiratory symptoms.
- The levels of chemicals that induced the symptoms were low. For instance, Case 2 reacted with distress to another patient in the office who was wearing perfume. Case 1 reacted to nail chemicals inside a mall but outside of the shop.
- In both cases a number of unrelated chemicals induced the response.
- In Case 2, the patient improved after leaving work and living in the Bushveld. The patient in Case 1 still experiences discomfort on exposure to solvents, although, having stopped work, she is no longer exposed to dental chemicals.

The diagnosis had not been made in the case of patient 2 prior to referral for disability assessment; but an

occupational health practitioner who was aware of this syndrome was able to make the diagnosis in patient 1. Both cases were accepted by the insurance company as having a disabling disease and were awarded disability pensions.

The question remains whether MCS can be classified as an occupational disease and, most importantly, whether compensation can be obtained for sufferers. It is not listed in Schedule 3 of the Occupational Health and Safety Act 181 of 1993¹⁶ as a compensable occupational disease. However, since MCS may be triggered by chemical exposure at work, submission of a claim should be considered. This is provided for in Chapter VII Occupational Diseases, paragraph 64, sentence 1(b) which states that an ‘employee shall be entitled to the compensation provided for and prescribed in this Act if it is proved to the satisfaction of the Director General’ that the disease, even if not listed in Schedule 3 ‘has arisen out of and [in] the course of his or her employment’.

CONCLUSION

The existence of this condition as an entity has been controversial but it is increasingly being accepted. The cause or causes are not known but are being extensively researched. Both these patients conformed to all the criteria laid down in 1999 and again in 2005. Clinicians need to be aware of the syndrome, especially in view of the devastating effect it has, in severe cases, on the ability of patients to work and earn a living. No effective treatment other than the avoidance of chemicals was available, and both patients therefore claimed and were awarded disability payouts. Medical practitioners should be patient and sympathetic when confronted with such cases and should motivate for compensation if the work environment has played a causative role.

DECLARATION OF CONFLICT OF INTEREST

The author declares no conflict of interest.

This article has been peer reviewed.

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