

Managing environmental sensitivity: an overview illustrated with a case report

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While the adverse impact of certain environmental agents is well established and affect individuals in a predictable dose-dependent manner, the validity of some exposure syndromes, such as environmental sensitivity, attributed to the influence of environmental chemicals in low, usually harmless doses, is less certain. Diagnosis of environmental sensitivity is subjective, and both standard medical and complementary and alternative treatment often fails to provide clinically meaningful functional gains. Existing evidence suggests that in many individuals with these syndromes, psychosocial factors play a prominent role. In this article we present an approach to managing patients presenting with sensitivities to environmental agents that includes identifying and managing organic disease, obtaining a thorough biopsychosocial history, confirming a diagnosis, and developing a rehabilitative process that focuses on support and improvements in function. A case of multiple chemical sensitivity illustrates this approach.

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Alors que les répercussions néfastes de certains agents environnementaux sont bien établies et touchent des personnes d'une manière liée à la dose prévisible, la validité de quelques syndromes d'intoxication tels que la sensibilité environnementale attribuée à l'influence de produits chimiques environnementaux en faibles doses (en général inoffensives) est moins certaine. Le diagnostic de sensibilité environnementale est subjectif et tant les soins médicaux standard que les traitements complémentaires ou de remplacement ne réussissent souvent pas à permettre l'obtention de gains fonctionnels cliniques significatifs. Les preuves actuelles suggèrent que chez de nombreuses personnes aux prises avec ses syndromes, les facteurs psychosociaux jouent un rôle important. Dans le présent article, nous présentons une approche de prise en charge des patients présentant des sensibilités aux agents environnementaux comprenant l'identification et la gestion thérapeutique des maladies organiques, l'obtention des antécédents biopsychologiques complets, la confirmation d'un diagnostic et l'élaboration d'un processus de réadaptation mettant l'accent sur le soutien et les améliorations de la fonction. Un cas d'hypersensibilité chimique environnementale illustre cette approche.

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Introduction

Environmental sensitivity is an acquired condition attributed to low-level, normally well-tolerated, environmental exposures.^{1,2} Experts have advocated many terms for the resulting illness (Table 1), and in 1996 a World Health Organization workshop recommended adopting the term Idiopathic Environmental Intolerance to denote the substantial overlap between these labels.³ Despite limited biomedical evidence to support its underlying causal inferences,³⁻¹⁰ environmental sensitivity has become a commonly-assigned syndrome. Individuals so labeled are high consumers of healthcare resources – particularly complementary and alternative therapies including chiropractic. In Gibson et al.’s recent survey of patients with environmental sensitivity, 54% (498 of 917) had engaged with a chiropractor.¹¹ Given the high use of chiropractic by patients with environmental sensitivity we feel that chiropractors should be apprised on this topic.

In this article, we review the epidemiology and pathophysiology of environmental sensitivity, and offer a general approach to the management of patients. We do not contend that environmental sensitivity is of purely psychogenic nature. Rather, we suggest that psychosocial features are often prominent, and that attending to these issues will serve patients well. Our goal is not to teach the skills necessary for the management of environmental sensitivity, but rather to illustrate the dangers of rigid and exclusive insistence on a biologically-based approach, and the general principles of an alternative behavioral strategy. While our approach to environmental sensitivity does not ascribe to a traditional chiropractic model, we believe that there is good evidence to support a biopsychosocial approach, specifically physical activation and cognitive behavioural therapy, and that providing this information will assist in the development of management strategies for this population. We illustrate our approach by presenting a patient with multiple chemical sensitivity whom one of us (JWB) attended in clinical practice, in collaboration with a consultant psychiatrist and a social worker trained in cognitive behavioral therapy.

Table 1 *Some labels applied to those designated as environmentally sensitive*

Allergic toxemia
Cerebral allergy
Chemical AIDS
Chemical hypersensitivity syndrome
Chemical intolerance
Environmental hypersensitivity
Environmental illness
Environmental irritant syndrome
Gulf War syndrome
Multiple chemical sensitivity
Sick building syndrome
Systemic candidiasis
Total allergy syndrome
Toxic carpet syndrome
20th-century disease
Universal allergy

Case

A 35-year-old female, computer consultant presents with complaints that include headaches, fatigue, palpitations, back pain, thinning hair, insomnia, and cognitive deficits. Labels that clinicians have suggested for her illness have included multiple chemical sensitivity, fibromyalgia, irritable bowel syndrome, and chronic fatigue syndrome. She describes allergies to numerous foods and chemicals and notes that exposure to perfumes, car exhaust, tar, coffee, and cigarette smoke cause nausea and headaches. She has received full disability from work for the past two years. A family physician with an interest in environmental medicine, currently supervising her care, has provided a diagnosis of multiple chemical sensitivity and prescribed a number of vitamins, minerals, and supplements, but no prescription medications. According to the patient, this provider engaged her in a model of diagnosis and treat-

ment known as ‘Nambudripad’s Allergy Elimination Technique’ and through this method she was deemed allergic to 70 different compounds including her own DNA. The patient is happily married, and reports that when she was working she was a “big star” of the company. Extensive laboratory investigation, including conventional allergy testing, has revealed no abnormal results.

Epidemiology

It is difficult to estimate the burden of environmental sensitivity as there are no objective criteria by which to define these disorders.^{10,12} Furthermore, the overlap between features of environmental sensitivity and other medically unexplained syndromes is substantial.^{13–15} Evidence suggests that environmental sensitivity may be a culturally bound phenomenon, in that this syndrome appears restricted to industrialized countries.¹⁶ In spite of these limitations, the prevalence of individuals labelled and treated as environmentally sensitive appears to be substantial.^{17,18} In 1995, of 4046 randomly selected adults in California, 6.3% reported physician-diagnosed environmental illness or multiple chemical sensitivity.¹⁹ Hausteiner and colleagues interviewed 2032 adult Germans in 2000, and found self-reported chemical sensitivity in 9%.²⁰

Pathophysiology

In 1999, the United Kingdom Health and Safety Executive commissioned the most comprehensive, systematic examination to date of the data supporting different aetiological models of environmental sensitivity.²¹ The reviewers adopted a broad definition that included all literature describing symptoms in more than one organ system elicited by various unrelated chemicals at very low levels of exposure. Strengths of the review included explicit eligibility criteria, a comprehensive search strategy that included examination of 14 databases, and assessment of study eligibility by independent reviewers. Evidence favouring a biological cause of environmental sensitivity was only available from case reports, case series and personal communications. The authors found evidence suggesting that multiple chemical sensitivity is sometimes used as an indiscriminative label for undiagnosed disorders. The review failed to find any reports of blinded challenge studies showing multi-system responses to low-level exposures.²¹ The authors concluded, “despite extensive literature on the existence of multiple chemical sensitivity, there is no un-

equivocal epidemiological evidence; quantitative exposure data are singularly lacking; and qualitative exposure data are, at best, patchy.”²¹ They further concluded, “There seems to be reasonably well documented associations between multiple chemical sensitivity and psychological characteristics”²¹

Subsequent to the U.K. review, Das-Munshi and colleagues recently completed a systemic review of provocation studies of persons reporting multiple chemical sensitivities (37 trials), and found that when participants were successfully blinded their reaction to purported triggering substances was no greater than chance.²² The authors concluded the mechanism of action of multiple chemical sensitivity is not specific to the chemical itself and might be related to expectations and prior beliefs.

Individuals presenting with environmental sensitivities have high rates of somatoform disorder, panic disorder, depression, substance abuse or dependence, anxiety, agoraphobia, personality disorders, and childhood abuse. Formal studies have reported psychiatric co-morbidity in this population ranging from 36% to 100%, depending on diagnostic criteria used.^{23–35} Of those patients presenting with multiple chemical sensitivity that do not qualify for a formal psychiatric disorder, many present with alexithymia – the inability to identify and use verbal language to describe feelings.³⁶ Successful resolution of symptoms with behavioural therapy further suggests that psychological factors have a role in maintaining symptoms.^{37–40}

Having developed the suspicion that they are suffering from a serious disease, patients labeled as environmentally sensitive may mistakenly re-attribute pre-existing benign bodily symptoms to this new disorder.⁴¹ This illness attribution, which focuses on physical causality, allows sufferers to understand their symptoms without the stigma associated with psychological illness,^{42,43} and to assume the sick role in an acceptable way. This does not imply that patients are malingering, feigning, or simulating illness.

Similar phenomenon may explain the suffering of some patients with other unexplained syndromes, including chronic fatigue syndrome, irritable bowel syndrome, and fibromyalgia. Some authors have postulated that labels assigned to such syndromes are an artifact of medical specialization.^{13,41} Diagnostic criteria for these syndromes frequently overlap, patients often meet the criteria for multiple syndromes, and similarities in patient characteristics, prognosis and response to treatment are

common.^{13-15,41} Clinicians should not view environmental sensitivity and similar disorders in isolation, but in the context of what is known about all unexplained multi-symptom illnesses.

While the etiology of environmental sensitivities remains an area of ongoing study, the literature we have reviewed suggests that after an appropriate search for a biological basis has proved fruitless, focus on psychological and behavioral issues may best serve patients' interests.

Initial assessment

There are no objective measures by which to discern environmental sensitivities, and specialized imaging studies such as positron emission tomography provide no useful diagnostic information.⁴⁴ The goal is to rule out those disorders that can be diagnosed, and that may be partially or wholly responsible for symptoms. If, following initial history, physical and mental examination, and investigation, classic allergic reactions remain a concern, referral to an allergist is appropriate. Allergists should perform a limited number of selected skin prick tests to specific triggers, as indicated by the clinical picture, since false positive results are common (Table 2).⁴⁵ If food sensitivity is an issue, prick tests should test for local wheals and flares only in response to the most suspect foods.⁴⁶⁻⁴⁸ Allergists will avoid intradermal testing of food antigens as they can generate an unacceptably high false positive rate and may elicit systemic reactions.^{46,47}

Patients may present with suspected reactions to commonly found chemicals with distinct odours. Given the limitations of skin-prick tests for solvents,⁴⁵ it may be advisable for allergists to pursue respiratory challenge with samples of the most offensive agents (e.g. perfume, hair-spray, etc.) identified and supplied by the patient, with explicit consent from the patient, so that the response can be observed. If there is no reaction, this would suggest that it is the context of the odor experience that triggers symptoms, rather than the odour itself. Is there a classical inhalant allergic reaction? Has the patient manifested observable signs of acute anxiety or panic reaction with hyperventilation, tremulousness, and palpitations?^{30,49,50} In cases where a true allergic reaction is suspected double-blinded (patient and clinician), placebo controlled, provocation studies remain the only assured method to provide confirmatory evidence.

Table 2 Allergy prick tests often indicated in environmental sensitivity⁴⁸

Tree mix	Dust mite
Grass mix	Dog dander
Ragweed	Cat dander
Alternaria mould	Five foods
Hormondendron mould	Two scented products

What clues suggest a prominent psychosocial component to the patient's problem? First, both physical examination and laboratory testing will be unremarkable. Individuals presenting with environmental sensitivities typically describe a number of unrelated agents as being 'triggers' for their symptoms (in our patient – perfumes, car exhaust, tar, coffee, and cigarette smoke).⁵¹ In individuals in whom toxic exposures play little or no etiological role in symptoms, the doses associated with symptoms are likely to be exceedingly low, and resultant physical complaints tend to affect multiple systems (in our patient – headaches, fatigue, palpitations, back pain, thinning hair, insomnia, and cognitive difficulties). The time from exposure to a trigger and symptoms will often be very rapid, and the severity of response will be independent of the dose.^{52,53}

Building a therapeutic relationship and establishing psychosocial contributors

The clinician who concludes that the presenting illness has a significant psychogenic component must remain aware of potential threats to the development of a positive therapeutic relationship. Early in the consultation, emphasis on psychosocial factors as explanations for symptoms may be alienating and threatening to the patient, and initially the patient may manifest considerable reluctance to disclose information that is non-environmentally related. Prior to our involvement, the patient in our example was referred for psychiatric assessment but left the initial appointment part-way through and refused to return as she felt the psychiatrist was advocating symptoms were 'all in her head.' The psychiatrist queried a diagnosis of borderline personality disorder.

Patience and understanding often allows the patient to ultimately engage in discussion of potential psychosocial

contributors. Clinicians must then consider if referral to a counsellor is appropriate, and it is advisable to involve patients in this decision process. Referral for counselling should be considered if functional gains have stalled due to suspicion of unresolved psychosocial issues.

Patients seeking a diagnosis for the purposes of obtaining disability benefits present a particular challenge. While we believe that true malingering in cases of environmental sensitivity is rare, the potential contribution of secondary gain, merits of assuming the sick role, and the psychological benefits of attributing the illness experience to external factors require consideration.⁵⁴

In our case, as one of us (JWB) developed a therapeutic relationship, it became possible to explore non-environmental issues. As it turned out, the patient had experienced similar symptoms while attending university at a time when scholastic pressures were especially intense. Following two years of resultant disability, clinicians informed the patient that she would simply have to endure her symptoms as they could identify no discernable cause. The patient pursued vigorous physical activity and managed to recover in approximately 6 months. While there are numerous benefits to exercise, including improved endurance, sleep and mood⁵⁵⁻⁵⁷ which plausibly contributed to the patient's recovery, lack of insight into the initial episode may have left the patient susceptible to a subsequent illness.

After completing university, the patient had changed workplaces every two years over the last decade. At each position she was given progressively more work, and feeling unable to refuse the added workload, but also unable to manage the pressure, she would leave and take a job with a new company.

At her most recent position a new manager reversed a prior flexible working arrangement, and insisted that she acquire explicit permission for each deviation from her work schedule – permission that was rarely granted. The patient had to arrive with the rest of the employees, and walk through the underground parking garage when most cars had recently come in, and had thus produced noticeable car exhaust. The first agenda each morning was a meeting wherein most employees would arrive with a cup of coffee, and the new manager would appear, as the patient described it, “dripping with cologne.” These meetings became a source of anxiety for the patient, and she regularly felt singled out and belittled. Ultimately, the pa-

tient noted that car exhaust, and the smells of coffee and perfume, became powerful triggers of her symptoms.

Management: passive vs. active coping

Failure to identify a specific toxic cause of symptoms dictates a practical approach involving treatment of any psychiatric disorder and guidance that promotes physical and social functioning. Scheduling of regular appointments provides the patient with attention without having to manifest symptoms, and avoids care-seeking from multiple providers, which runs the risk of iatrogenesis.^{58,59} The goal of recovery, especially for those individuals on disability, is a critical issue. If the previous workplace environment was in some way responsible for the patient's presentation it will be difficult, if not impossible, to engage them in a rehabilitative effort that concludes with a return to the same environment. Appropriate treatment that comprises behaviour and belief modification is often long and time consuming, and is best managed by a skilled and sympathetic team.

The patient in our case example had, for two years, received treatment according to a biological model of environmental sensitivity that focussed on avoidance, and hypothetical strategies to rid oneself of ‘toxins’ and reduce sensitivity to purported triggers. This involved removal of indoor carpets, a variety of rotation diets, supplements and vitamins, and bi-weekly injections of “enzyme potentiated desensitization therapy,” a therapy that is not supported by current evidence⁶⁰ and which the patient had recently discontinued because of the associated out-of-pocket cost. Advice had included avoiding a large number of potential environmental triggers, which led to the patient rarely leaving her house.

After JWB and other health care providers became involved, the patient participated in eleven months of cognitive behavioural therapy, graduated physical activity, and an emphasis on re-socialization and consensual graduated exposure to purported environmental triggers. This strategy entailed exploring alternate paradigms for symptom-exacerbation.

In our case example, the patient interpreted symptom flares as proof that she was exposed to an environmental trigger. For example, she attributed symptoms experienced in a gym to cleaning solutions used there. Furthermore, the patient would describe feeling a great deal better when on vacation, and interpreted this as evidence that her

house was likely contaminated with some form of toxic mould. Conversations with the gym manager, however, revealed no consistent pattern to the use of cleaning solutions and the patient's experience of symptoms.

As therapy progressed, it became possible to discuss alternate explanations. It turned out that the patient felt uncomfortable in the gym due to poor body image, and the fear that her insurer would challenge her disability benefits if she did not improve her objective performance. Once she addressed these issues, the patient ceased to experience flare-ups at the gym. The patient also recalled that vacations had relieved symptoms during her previous episode of illness in university, despite living in different accommodations. Further discussions allowed the patient to develop strategies to promote her well-being at home; in other words, solving problems by better coping mechanisms versus avoidance through vacations.

During this process, the patient began to discuss her various concerns in terms of workplace stress, strained family relations, and an unhappy childhood. The cognitive and behavioural shifts during rehabilitation were gradual, and there were setbacks; however, the patient was ultimately able to view her illness in a manner that allowed for recovery, resolve her disability claim, and begin re-training for an alternate career. Towards the end of our involvement, the patient received a letter from her environmental physician informing her that some previous samples on file had been found to contain antibodies to multiple strains of *Mycoplasmas* necessitating immediate 'detoxification' of herself, her dog, and any shared water in the household, as well as 3-months of treatment with antibiotics. However, the patient had by this time adopted our proposed biopsychosocial model to understand her complaints and elected not to pursue this therapy.

Summary

Clinicians seeing patients reporting environmental sensitivities should be alert to psychosocial factors that may influence such phenomenon. Given the existing evidence surrounding the impact of beliefs in the expression of such syndromes,⁶¹⁻⁶³ clinicians should exercise caution in presenting patients with explanations of symptoms that focus on toxic exposures.^{64,65} The adverse consequences associated with a biological attribution may be considerable. They include social isolation, continued anxiety and disability, and financial losses.

The skill-set required to investigate and manage environmental sensitivity includes patience and understanding. Clinicians must rule out or address objective physical and psychiatric disease, and referral for co-management with mental healthcare providers may be appropriate. Treatment of remaining illness should expand beyond a symptom-based approach and focus on achieving functional gains, and the patient should play an integral role in determining the goals of recovery.

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