RESEARCH

Chemical intolerance among women with panic attacks in a family medicine clinic

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This study was funded in part by a research grant from the Texas Academy of Family Physicians Foundation.

Introduction

Panic disorder is common among primary care patients, with a prevalence as high as 12 percent (Katon et al., 1986). It is particularly important because of its association with depression, substance abuse and agoraphobia (Faravelli et al., 1989), increased health care utilization (Shapiro et al., 1984), and decreased quality of life (Markowitz et al., 1989). A better understanding of triggers and antecedents for panic attacks may enable us to provide more effective interventions and perhaps reduce this illness burden.

Chemical exposures have been linked to the onset of panic disorder in some studies, including organic solvents (Dager et al., 1987) and "superglue" (Yeragani et al., 1988). These observations suggest a potential role for environmental exposures and chemical susceptibility in panic disorder (Ashford, Miller, 1991). Caffeine sensitivity is prevalent in both chemical intolerance and panic disorder. New onset caffeine intolerance is commonly reported by a subset of individuals following a pesticide exposure, sick building episode or chemical spill. Subsequently, these individuals may describe severe caffeine withdrawal symptoms, causing them to avoid caffeine, or just the opposite — leading them toward caffeine, abuse, addiction and caffeinism (Miller, 2000).

These polar behaviors may in fact serve the precisely same function: the avoidance, or at least postponement of unpleasant withdrawal symptoms. Likewise, caffeine sensitivity and potentiation are well documented in panic disorder (Breslow et al., 1989; Apfeldorf, Shear, 1993). Patients with panic disorder have been found to be particularly sensitive to pollen (Goodwin, 2002) and dietary items such as chocolate, alcohol and nicotine (Breslow et al., 1989). Similarly, chemically intolerant individuals characteristically report sensitivity to alcohol, nicotine and a wide variety of medications and foods, as well as fragrances, traffic exhaust, cleaning agents and other everyday exposures.

Patients with environmental intolerances report high levels of anxiety and agoraphobia (Poonai et al., 2001). In fact, chemical intolerance may represent a kindling-like phenomenon, resulting in cognitive and affective difficulties (Bell et al., 1992). The origins of chemical intolerance, risk factors for its development and underlying mechanisms remain a mystery. However, recent studies suggest that genetic polymorphisms involved in the detoxification of specific environmental toxicants and drugs may place certain individuals at increased risk for developing the condition following a salient exposure.

Traumatic life events are associated, at least in some individuals, both with onset of panic attacks and with chemical intolerance. Chemical intolerance is more prevalent in individuals with high levels of life stress and past abuse (Bell, 1994). Panic disorder is also linked to childhood abuse (Safren et al., 2002; Stein et al., 1996; Moisan and Engels, 1995; David et al., 1995; Pribor and Dinwiddie, 1992). Sensitization of key brain areas, such as the limbic system, conceivably could occur via cortical input (psychosocial stress) or a chemical exposure event (olfactory-limbic sensitization). Once sensitized, these pathways would be vulnerable to reactivation either by subsequent stressful events or environmental exposures, including events or exposures that formerly would have been tolerated without difficulty (Bell et al., 1992).

We hypothesized that individuals reporting a history of panic attacks and associated illnesses in a primary care setting would have a higher prevalence of chemical intolerance. Whether chemical intolerance preceded or followed the onset of their panic attacks, once sensitized, chemically intolerant individuals may experience panic attacks and other distressing symptoms following exposure to everyday environmental chemical triggers.

The purpose of this study was to determine whether patients who experience panic attacks are more likely to be chemically intolerant and what environmental chemical exposures and psychosocial stresses might underlie or trigger their panic attacks.

Methods

This study was conducted in the Family Health Center at the University Health Center-Downtown (UFHC-DT). Adult women in the UFHC-DT waiting room were approached for participation. Those who agreed to participate were screened for a lifetime history of panic attacks using the panic disorder items on the Structured Clinical Interview of the DSM-IV (First et al., 1996). Those women meeting DSM-IV criteria for panic attacks were invited to participate in the full interview.

Following informed consent, subjects completed questionnaires about demographics, onset of panic disorder, chemical intolerance, childhood abuse and post-traumatic stress disorder. Chemical intolerance was assessed using the Quick Environmental Exposure and Sensitivity Inventory (Miller, Prihoda, 1999a). This instrument includes four 10-item scales rating the severity of symptoms, chemical intolerance, other

intolerances (including foods, drugs, medications, alcohol, caffeine), and masking items (ongoing exposures that may interfere with subjects' recognition of intolerances, such as smoking, fragrance use or caffeine consumption). "Chemical intolerance" was defined as a score greater than or equal to 40 on both the Chemical Intolerance and Symptom Severity scales. Childhood abuse was assessed using the History of Physical and Sexual Abuse Questionnaire. This 16-item instrument consists of scales for physical abuse and sexual abuse. (Meyer et al., 1996). In addition, subjects who reported childhood abuse completed the Post-Traumatic Stress Disorder Section of the Structured Clinical Interview of the DSM-IV (SCID) (First et al., 1996).

Associations between conditions were assessed using odd ratios. Differences between groups were assessed using t-tests, and comparisons were made between subjects' scores and those of historical controls (from Miller and Prihoda, 1997a, b) using one-sample t-tests. Due to the exploratory nature of this study, a $p < 0.10$ was deemed significant.

Results

The sample consisted of 40 women of middle or lower socioeconomic status, 55 percent of whom were Hispanic with a mean age of 48 years, all of whom reported having experienced panic attacks. Among this sample, 33 percent met the full diagnostic criteria for panic disorder, 73 percent met criteria for chemical intolerance, and 78 percent had a history of childhood abuse; 62 percent of those with childhood abuse also met criteria for PTSD. Table 1 shows that the 40 women in our primary care clinic sample who had experienced panic attacks had much higher scores on the Chemical Intolerance, Other Intolerance, and Symptom Severity scales than did historical controls.

Table 2 presents the associations between chemical intolerance and childhood abuse and PTSD. Chemical intolerance was linked to childhood physical abuse, extrafamilial sexual abuse, and PTSD in a subset of the sample. Table 3 compares the scores for the Chemical Intolerance and Other Intolerance scales between subjects with a history of abuse and/or PTSD against those without such a history. Subjects with a history of abuse and/or who met criteria for PTSD had significantly higher chemical intolerance scores.

Discussion

This exploratory study provides preliminary evidence that primary care patients with a history of panic attacks are far more likely to report chemical and other intolerances (foods, medications, alcohol, caffeine). Nearly three-fourths of the patients in this study met stringent criteria for chemical intolerance, as opposed to historical controls (6 percent). Whether chemical intolerance is a predisposing factor and/or consequence of panic attacks/psychosocial stress cannot be determined. Nevertheless, upon subsequent exposure to everyday chemicals, caffeine, alcohol, etc., affected individuals may experience pronounced symptoms, including symptoms that align with diagnostic criteria for panic disorder

and PTSD. This suggests that environmental chemical exposure could underlie or trigger symptoms in a substantial number of individuals who fit diagnostic criteria for these conditions.

These findings may have clinical implications. First, women who were abused as children may be at increased risk for the development of chemical intolerance, PTSD, and panic disorder. The order in which these conditions appear cannot be inferred from this study. Second, this study demonstrates plausible links between these phenomena in some individuals, improving our understanding of several common medical conditions. Third, if chemical exposures initiate and/or trigger panic attacks or symptoms of PTSD, this suggests new, potentially fruitful approaches for treating these individuals. For example, if sub-threshold limbic kindling is involved, avoidance of triggering substances such as pesticides, fragrances, certain foods, alcoholic beverages, caffeine and drugs that may further activate the limbic system may be helpful, as might medications that reduce limbic reactivity. Understanding the role of environmental exposures would add new understanding and new tools to the very limited and often ineffective armamentarium currently available for treating panic disorder and PTSD.

This study has several limitations. First, the small sample size means that only large differences or associations will be identified as statistically significant, even with a 90 percent confidence interval. Second, as a cross-sectional study, the temporal relationships are assumed and are only associational, not causal. Finally, we wish to be clear that this sample was limited to women who reported having panic attacks. We did not look at a group who reported chemical intolerance and then assess them for panic attacks, PTSD, childhood abuse, etc. Thus, some or even most chemically intolerant individuals may have no history of panic attacks, PTSD-like symptoms or history of childhood abuse. This is an important distinction.

In conclusion, this exploratory study demonstrated that women seen in a primary care setting who reported a history of panic attacks were likely to suffer from chemical and other intolerances, panic disorder, childhood abuse and PTSD. Further investigations are needed to confirm or refute our findings and clarify the nature of these associations.

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