

# Migraine and Stress: A Daily Examination of Temporal Relationships in Women Migraineurs

Jeffrey E. Holm, PhD; Cami Lokken, PhD; Tricia Cook Myers, MS

This study examined daily temporal relationships between stress, cognitive appraisal, coping, and migraine in a group of young women migraineurs sampled from a general population. Participants (N=20) meeting International Headache Society<sup>1</sup> criteria for migraine with or migraine without aura provided headache activity, perceived stress, cognitive appraisal, and coping strategy data across 2 months of data collection. A time-series analytic approach was used to cross-correlate daily stress, appraisal, and coping data with daily headache data controlling for factors that can inflate correlations in data collected across time. Analyses revealed that between 50% and 70% of subjects showed significant, substantial, and meaningful temporal correlations between their daily stress and their daily migraine activity. Furthermore, these data support the hypothesis that stress and migraine are reciprocally related (ie, cyclically influencing each other across time). In addition, despite some measurement concerns, our data suggest that cognitive appraisal and coping are also related to migraine activity in a reciprocal fashion.

**Key words:** migraine, stress, cognitive appraisal, coping, time-series, longitudinal

**Abbreviations:** CSI Coping Strategies Inventory, DSI Daily Stress Inventory, DCAI Dakota Cognitive Appraisal Inventory

(*Headache* 1997;37:553-558)

Stress is often linked to the occurrence of migraine headaches.<sup>2-5</sup> In fact, Robbins<sup>6</sup> reports that it is one of the most commonly reported precipitants of migraine. Studies examining the relationship between stress and migraine have either: (a) asked migraineurs to recall the number, types, and occasionally their perceptions of stressful events in their lives over a given time period<sup>7-11</sup>; (b) manipulated characteristics of stressful situations in the laboratory and assessed migraineurs' psychological and physiological reactivity<sup>12-15</sup>; or (c) had migraineurs self-monitor

stress and headache on a daily basis over several weeks or months.<sup>16-18</sup>

Studies examining migraineurs' reports of life stressors, including how they appraise and cope with them, have generally found migraine to be associated with more life stressors which are often appraised as threatening and coped with in a more passive or avoidant manner.<sup>7-11</sup> Although these studies are often cited as supporting the hypothesis of a relationship between stress and migraine, they suffer from some noteworthy limitations. By relying on subjects' recollections of past events, the data from these studies are likely to be confounded by any of several factors shown to influence memory of personally relevant experiences<sup>19</sup> or responses or both to global self-report scales.<sup>20</sup>

Attempts to avoid the threats to internal validity associated with recollections of stressful experiences, have led some researchers to examine stress and migraine via experimental manipulation in the laboratory.<sup>12-15</sup> Although several studies have examined headache sufferers' autonomic reactivity to stressors in the laboratory,<sup>12,13,15</sup> few have examined an individual's subjective experience of stress, appraisal, and coping.<sup>14,21,22</sup> In perhaps the only study to comprehensively examine migraineurs' autonomic and subjective responses to a laboratory stressor, Holm and colleagues<sup>14</sup> recently manipulated the clarity/ambiguity and positive/negative valence of a potentially stressful laboratory event in groups of migraineurs, tension headache, and control subjects. Although migraineurs did not differ from controls in any of the self-reported stress measures used in this study, they did differ from both control and tension headache subjects in their pulse rate recovery time. Although laboratory studies of stress and headache are able to avoid some of the problems that can plague retrospective self-report studies, they can be limited by questions concerning their external validity (eg, artificial, brief

---

From the Department of Psychology, University of North Dakota, Grand Forks.

Address all correspondence to Dr. Jeffrey E. Holm, Department of Psychology, Box 8303, University of North Dakota, Grand Forks, ND 58202.

Accepted for publication January 1, 1997.