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Bakal D A & Kaganov J A. Muscle contraction and migraine headache: psychophysiologic comparison. *Headache* 17:208-15, 1977.
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Migraine and muscle contraction (tension) headache sufferers were compared for symptoms of musculoskeletal and vascular activity and responsiveness to biobehavioral treatment. Both diagnostic headache groups were observed to be highly similar in terms of underlying electromyographic activity and pulse velocity activity as measured from superficial temporal arteries. The groups were also highly similar in terms of pain locations, pain frequency, and accompanying symptoms. [The *SCI*® and *SSCI*® indicate that this paper has been cited in over 110 publications.]

Symptom Similarities Across Headache Sufferers

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We had decided to conduct a psychophysiologic comparison of muscle contraction and migraine headache sufferers in order to validate the clinical characteristics that are almost universally accepted to differentiate these two disorders. Neurologists provided the patients and also made the clinical diagnosis of migraine or muscle contraction headache. The first phase of the study involved having the subjects/patients keep careful track, on a self-observation record, of their time of headache onset, the location of headache pain, and the presence/absence of accompanying symptoms (light sensitivity, nausea, vomiting). We collected this information across 21 days and discovered that, on the basis of group comparisons, there were no differences in pain location or symptoms between patients previously diagnosed as migraine or muscle contraction headache sufferers. These observations were to become the basis of our severity model of headache.[1] At the heart of the model is the assumption that the processes controlling muscle contraction and migraine headache are more similar than dissimilar. The approach also challenged the traditional belief that muscle contraction and migraine headaches are different disorders with different etiologies, requiring different forms of treatment and prevention.

Some concern was expressed from diagnosticians that the severity approach implied that all headaches were the same. This was not the case, as we were simply trying to bring attention to the similar psychobiologic processes that underlie the development and maintenance of chronic headache disorders. There was and still is no intent to collectively group all headaches together. Criticisms were also directed at the patients used in the study. Given that they were all chronic headache sufferers, it was argued that distinctive vascular and muscular features of migraine and tension headache might be more discernible at an earlier stage in the headache sufferer's history. To test this hypothesis, Risha Joffe and I conducted a study of headache in children. We observed a degree of symptom overlap similar to what had been observed in adult headache sufferers. Moreover, we also observed that, as the disorder became more severe, it showed a distinct tendency to begin to operate autonomously from environmental triggers.

The study is most frequently cited for the demonstration of virtually identical headache patterns in clinically diagnosed migraine and tension headache sufferers. It is also cited because of its demonstration of tonic musculoskeletal activity in both groups of patients. Finally, it is also often cited to support claims that stress causes headache. In actuality no data were provided on the stress-headache connection. The study has generated a number of empirical observations consistent with a severity approach, and it has also had some impact on headache and its management, especially with those in clinical and general practice. The data have also been used to enhance patient and public awareness of the complex psychobiologic variables that contribute to headache onset. We have since argued that headache susceptibility is a relatively continuous psychobiologic condition that usually operates outside the headache sufferer's awareness.[2] This condition is often recognizable through musculoskeletal sensations, especially as reflected in chronic tension in head, face, neck, and shoulder regions. Other subtle sensations are also present and warrant investigation. The severity formulation that developed from the study continues to guide our research and practice with headache sufferers at large.

1. **Bakal D A.** *The psychobiology of chronic headache.* New York: Springer, 1982. 164 p. (Cited 40 times.)
2. **Bakal D A, Demjen S & Kaganov J A.** The continuous nature of headache susceptibility. *Soc. Sci. Med.* 19:1305-11, 1985.