**Can the Visual Analog Scale Be Used as a Long-Term Outcome Instrument to Track Pain Severity in Orthopaedic Patients?**

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**Background/Purpose:** The chief complaint of most orthopaedic patients is pain; as such, change in pain severity has become the primary outcome of many studies. Currently, most studies assess patients' pain using a visual analog scale (VAS) yielding a "pain score" that is routinely used to track pain severity over time. Advocates of the VAS argue that it allows for more discrete measurements, while its opponents claim that a Likert scale is easier to administer. The literature has shown that in short-term periods of less than 24 hours, the VAS and Likert-based scales are equal to one another in terms of statistical results. However, a scarce amount of research has been done to examine the comparativeness of the two scales in periods ranging from weeks to months. We hypothesize that using a VAS as a long-term measure of patients' pain will correlate poorly with their long-term perceived change in pain. Therefore, we assessed the correlation of patients' change in pain measured using a VAS versus their perceived change in pain using a Likert scale.

**Methods:** Retrospective review was performed of prospectively collected data on all distal radius fractures (DRFs) treated at our institution from 2010-2012 with patients that gave informed consent. At the initial and each follow-up visit, patients used a VAS to indicate their level of pain at rest (VAS-Rest) and when actively using the injured extremity (VAS-Active). At follow-up visits, patients answered a question that asked: "how do you feel that your pain has changed since your last orthopaedic clinical visit?" This "change in pain" (CP) question consisted of a 5-level Likert item. Patients' pain data points were grouped into independent data sets consisting of 3 data points (VAS-Rest, VAS-Active, and CP). Incomplete data sets were excluded. Then, the difference in VAS pain scores between consecutive visits and the CP score were compared using Spearman's correlation coefficient. A P value of less than 0.05 was considered significant.

**Results:** 98 patients suffering a DRF were included in this study. Among these, 24 were excluded due to incomplete data sets. A total of 74 patients (54 females, 20 males) with 238 VAS-Rest, 238 VAS-Active, and 119 CP scores were then analyzed. Mean patient age was 54 years (range, 19-82 years). Mean time interval between pain severity scores was 3.16 months, and mean total follow-up time (first to last visit) was 6.85 months. Spearman coefficient showed weak correlation between patients' CP score, and VAS-Rest and VAS-Active pain scores ($r = 0.237$ and $r = 0.251$, respectively [$P = 0.01$]).

**Conclusion:** The results of this study show that the commonly used VAS may be a poor measure for assessing patients' long-term pain. This is highlighted by the poor correlation the difference in VAS pain scores between visits has with CP score. Additionally, since previous studies have indicated that the clinical context and setting of the evaluation of pain scales are influential in determining the reliability and responsiveness of these scales, our results direct attention to the need for further research (conducted in a variety of clinical settings) into the long-term reliability of the VAS. These studies should also assess the correlation

each of these scores has with physiologic markers appropriate to the clinical context. This will help determine if a more consistent pain severity measure and/or a shift away from a VAS as the primary pain measure is needed for research that more accurately assesses orthopaedic treatment outcomes.



See pages 47 - 108 for financial disclosure information.