

Sphygmomanometry-evoked allodynia for the identification of fibromyalgia patients

Arthi Chandran¹, Cheryl Coon², Susan Martin², Lori McLeod², Theresa Gilligan², Lesley Arnold³

¹Pfizer Inc., New York, NY, USA, ²RTI Health Solutions, Ann Arbor, MI, USA, ³University of Cincinnati College of Medicine, Cincinnati, OH, USA

Purpose

Fibromyalgia (FM) is a chronic pain condition that affects approximately 2% of the United States. Aside from the characteristic widespread pain, patients also suffer from headaches, sleep disturbances, anxiety, and depression. Although the American College of Rheumatology (ACR) established classification criteria in 1990, FM remains an underdiagnosed condition. Efficient diagnosis and management of FM is crucial due to its burden on patients' lives. Previous studies have shown that FM patients often experience sphygmomanometry-evoked allodynia at lower levels than other patients. This study evaluated whether pain experienced from a blood pressure cuff could be used as a screener for FM.

Method

In this cross-sectional, multicenter study which included primary care physicians, rheumatologists, and other pain specialists, participants were assessed for FM according to the 1990 ACR criteria. Subjects had their blood pressure taken 3 times on each arm while seated. Participants were told to indicate if they felt pain while the blood pressure cuff was being inflated. If the patient indicated pain during inflation, the cuff pressure at the moment of pain initiation was recorded. If the patient did not indicate pain during inflation prior to 180 mm Hg, then a notation of no pain was made and a cuff pressure of 180 mm Hg was recorded. Each site was provided a sphygmomanometer to ensure standardization. The mean of the 6 cuff pressure levels at which pain was experienced was used for the analyses. Logistic regression was performed to analyze the relationship between sphygmomanometry-evoked allodynia and fibromyalgia.

Results

Of 150 participants evaluated, 148 were included for analyses (one subject's arm circumference was too large for the sphygmomanometer and another did not receive a physician evaluation for ACR diagnosis for FM). The FM group (n=78) was on average 54 years old and predominantly female (91%). The non-FM group (n=70) also had an average age of 54 years and had 42 females (60%). The rate of sphygmomanometry-evoked allodynia in the FM group was significantly higher than that in the non-FM group (78% vs 36%, respectively; $\chi^2=27.4$, $P<.0001$). In addition to having a greater proportion of participants reporting pain, the FM group also reported pain at a significantly lower cuff-pressure level ($T=5.3$, $P<.01$). Although the range of levels associated with pain was about the same for FM and non-FM participants, the FM participants reported pain at an average of 132 mm Hg, while the non-FM participants did not report pain until 166 mm Hg. The association between the cuff-pressure level at which pain was reported and the ACR FM diagnosis was tested using logistic regression, and the cuff-pressure level at which pain was reported significantly predicted the FM diagnosis ($P<.01$). The point estimate was calculated as 0.98, indicating that the odds that a patient has FM decreases by 2% for each 1 mm Hg increase in the cuff-pressure value at which pain is reported.

Conclusions

Presence of sphygmomanometry-evoked allodynia can be a useful screening tool to raise clinical suspicion of FM. In line with previous research, this study showed that FM patients experience pain from the blood pressure cuff at a

significantly lower pressure level than patients without FM. In clinical practice, the presence of pain from the blood pressure cuff could be used to decide whether a patient should undergo further evaluation for FM. With clinicians better able to identify potential FM patients with a quick and cost-effective method, patients can be diagnosed sooner, leading to earlier management of this common, painful condition.