Patient Ethnicity Differences in Local Anesthetic Requirements for Labor Pain

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Introduction: Patients often perceive pain in different ways, some of which may be based on prior experiences or ethnic/genetic backgrounds (1,2). While we have shown differences in local anesthetic requirements of different BMI patient populations for labor pain (3), this has not been studied in different ethnic patient populations. We undertook a study to estimate the local anesthetic requirements (MLAC) in two patient populations: African American and Caucasian, using the standard up down sequential allocation technique.

Methods: After IRB approval, separate MLAC sequences were performed in Caucasian (C) and African American (AA) groups of patients in labor. Subjects were multiparous, singleton pregnancies, between 36 and 41 weeks, and cervical dilation between 3 and 6 cm at the time of epidural request, and had a cephalic presentation. Exclusions for this study were patients under 18, BMI >35, a history of substance abuse, receipt of opioid or sedative medications 4 hours before epidural procedure, preeclampsia, macrosomia, non reassuring fetal heart rate, and abnormal biophysical profile or oxytocin stress tests. If the pre-epidural Visual Analogue Pain Score (VAPS) was <30/100 mm, the patient was also excluded from the study. The standard up down sequential allocation technique was followed, with starting concentrations of 0.1% Bupivacaine (20mL) and dosing increments of 0.01% in each group. The data from 43 patients were analyzed (23 AA and 20 C).

Results: There were no significant demographic differences between the two groups (p>0.05, t test) for height, weight, pain scores (VAPS), age or cervical dilation. Using probit regression after log transformation there was a significant effect of concentration which was consistent with a dose-response model, with the effect of group being significant in the study. The MLAC (EC50) was 0.054% in Caucasian and 0.088% in African American groups and the ratio of effects of AA to C was 1.62 (95%CI 1.03 to 4.33).

Discussion: In past chronic pain studies, African Americans have shown the lowest tolerance for pain, with Caucasian groups having the highest (1,2). African Americans have shown longer recovery times from anesthesia than Caucasians (4), so it is surprising to see that the local anesthetic requirements for labor analgesia in AA patients to be 61.4% lower than in Caucasian patients. Providers that are sensitive to all the contributory factors for pain requirements can better serve their patient populations with effective amount of appropriate pain medications and should be aware that it is not one dose fits all with epidural dosing and careful titration is needed to meet patient dosing requirements.

References: